1041

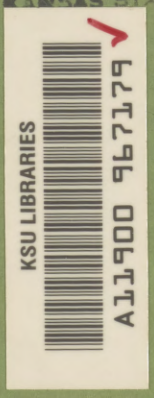
Y4.C73/2:92-91

AUTO SAFETY OVERSIGHT

DOCUMENTS

FEB 20 1973

THE LIBRARY
KANSAS STATE UNIVERSITY



HEARINGS

BEFORE THE

COMMITTEE ON COMMERCE
UNITED STATES SENATE

NINETY-SECOND CONGRESS

SECOND SESSION

ON

AUTO SAFETY OVERSIGHT

JULY 19, 20, AND 25, 1972

Serial No. 92–91

Printed for the use of the Committee on Commerce

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

AUTO SAFETY OVERSIGHT

HEARINGS

BEFORE THE

COMMITTEE ON COMMERCE
UNITED STATES SENATE

NINETY-SECOND CONGRESS

SECOND SESSION

ON

AUTO SAFETY OVERSIGHT

JULY 19, 20, AND 25, 1972

Serial No. 92–91

Printed for the use of the Committee on Commerce

U.S. GOVERNMENT PRINTING OFFICE
85-820 WASHINGTON : 1972

COMMITTEE ON COMMERCE

WARREN G. MAGNUSON, Washington, *Chairman*

JOHN O. PASTORE, Rhode Island
VANCE HARTKE, Indiana
PHILIP A. HART, Michigan
HOWARD W. CANNON, Nevada
RUSSELL B. LONG, Louisiana
FRANK E. MOSS, Utah
ERNEST F. HOLLINGS, South Carolina
DANIEL K. INOUYE, Hawaii
WILLIAM B. SPONG, JR., Virginia

NORRIS COTTON, New Hampshire
JAMES B. PEARSON, Kansas
ROBERT P. GRIFFIN, Michigan
HOWARD H. BAKER, JR., Tennessee
MARLOW W. COOK, Kentucky
TED STEVENS, Alaska
J. GLENN BEALL, Maryland
LOWELL P. WEICKER, JR., Connecticut

FREDERICK J. LORDAN, *Staff Director*
MICHAEL PERTSCHUK, *Chief Counsel*
S. LYNN SUTCLIFFE, *Consumer Counsel*
EDWARD COHEN, *Professional Staff Member*
ARTHUR PANKOPF, JR., *Minority Staff Director*
DAVID CLANTON, *Minority Staff Counsel*

CONTENTS

Page

Opening statement by Senator Hartke 1
Opening statement by Senator Cook 2

LIST OF WITNESSES

JULY 19, 1972

Furman, Ira J., Director of Communications, Consumers Union, Mount Vernon, N.Y. 8
Toms, Hon. Douglas W., Administrator, National Highway Traffic Safety Administration, Department of Transportation, accompanied by Lawrence Schneider, Chief Counsel; Robert Carter, Associate Administrator for Motor Vehicle Programs, and Jack L. Goldberg, Associate Administrator for Planning and Programing 4

JULY 20, 1972

Opening statement by Senator Hartke 41
Aspin, Hon. Les, U.S. Representative from Wisconsin 46
Javits, Hon. Jacob K., U.S. Senator from New York 42
Pulley, Charles H., president, American Safety Belt Council, Washington, D.C. 62
Prepared statement 69

JULY 25, 1972

Opening statement by Senator Hartke 73
Copp, Harley, on behalf of the Ford Cotor Co 177
Nader, Ralph, accompanied by Dr. Carl Nash; and Clarence Ditlow, Washington, D.C. 141
Miscellaneous letters 153–177
Schaffer, Donald L., vice president, secretary, and general counsel, Allstate Insurance Co., Allstate Plaza, Northbrook, Ill. 74
Toms, Hon. Douglas W., Administrator, National Highway Traffic Safety Administration 94
Questions of Senator Hartke and the answers thereto 390

ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS

Air-Bag Exploders "Hazardous", article 500
Air Bag Fails in Exhibititon of Safety, article 467
Air Bag Fails in Super-Safety Car, article 469
Air Bag Fails Test, article 468
Air Bag Fails To Work in Auto Safety Display, article 495
Air Bag Flunks Its Crash Test, article 467
Air Bag Too Slow in $4 Million Crash, article 479
Air Bags Deflated, article 470
Air Bags Fail: Extended Bumper Protects Test Car, article 463
Air Bags Fail in U.S. Crash Test, article 492
Air Bags: From Baloney to Guinea Pig Stage, article 493
Alba, John, article in the Phoenix Gazette 489
Are Air Bags Safe? article 495
Austin, D. A., director of operations, Lotus Cars Ltd., letter of July 6, 1972 441
Auto Air Bags Fail Again, article 477
Auto Safety Needs A New Road Map, article 449

	Page
Auto Safety Research Center, statement	507
Burch, Hon. Dean, Chairman, Federal Communications Commission, letter of August 30, 1972	92
Busby, David, counsel to the Automobile Importers of America, statement	438
Callahan, Joseph M., article from the Pontiac Oakland Press	477
Car Safety Not in the Bag, article	473
Compilation of State statutory provisions pertaining to safety inspection of schoolbuses	347
Dieffenbach, Al, article in the Seattle Daily Times	490
Elsen, Jack, article in the Washington Post	461
Evaluation of the 1960–63 Corvair handling and stability	218
Explosive Air Bags in Autos, article	480
Failure of Air Bags Mars Debut of $4 Million Car, article	488
Final Arguments Are Made in Air-Bag Case, article	463
Fisher, Dan, articles from the Los Angeles Times	479, 499
Flint, Jerry M., articles in the New York Times	460
Friedlander, Paul J. C., article in the New York Times	482
General Motors Corp., statement	533
Harding Doubts Reliability of Auto Air Bag, article	476
Hartke, Hon. Vance, U.S. Senator from Indiana, letter of August 9, 1972	92
Irvin, Robert W., articles	458, 466, 478, 480, 484, 496
Kahn, Helen, article from the Automotive News	486
Kilpatrick, James J., article from the Washington Evening Star	492
Kleene, Tom, article in the Detroit Free Press	464
"Lifesaving" Airbags Fizzle in Test: Dummy Driver Rams Into Windshield, article	481
Malfunction of Air Bag Reveals Basic Problems, article	475
Malone, Ross L., general counsel, General Motors Corp., letter of February 23, 1972	539
Markin, David, president, Checker Motors Corp., statement	437
Mateja, James, article from the Chicago Tribune	498
McCathy, Colman, articles	50, 59
Motor Vehicle Safety Standard No. 213—Child Seating Systems	11
Olson, Donald, director, Tire Safety Registry, division of Axicom Systems, Inc., statement	521
One Bag Works; Second Is a Failure, article	467
Ormsby, Ross R., president, Rubber Manufacturers Association, letter of August 3, 1972	505
Panel Evaluation of the NHTSA Approach to the 1960–63 Corvair Handling and Stability	191
"Poof!" Goes the Air Bag and Hope for Early Success, article	469
Press Time Briefs, article	491
Protective Air Bag May Need More Engineering, article	488
Pulley, Charles H., president, American Safety Belt Council, Inc., letter of July 11, 1972	442
Roberts, Bill, articles	476, 485
Seat Belts Before Air Bags, article	491
Siegel, H. M., director, Vehicle Safety Programing, American Motors Corp., letter of August 17, 1972	512
Smith, David C., article in the Washington Post	462
Smith, Turk, articles from the Arizona Republic	470, 474
Sumner, William, article from the St. Paul Dispatch	472
Test Safety, First, article	496
The Air Bag Blows It Again, article in the Los Angeles Times	459
The Air Bag Failure Deflates Some Hopes, article	474
The Air Bag Fizzle, article	472
The Air Bag That Wouldn't, article	465
Those Inflatable Air Bags, article	465
Toms, Hon. Douglas W., Administrator, National Highway Traffic Safety Administration, Department of Transportation, letter of July 28, 1972	501
Weir, C. Robert, chairman, Quality Assurance Committee and Herbert R. Herington, MTI executive secretary, statement	520
Weisskopf, J. J., letter of July 26, 1972	504
Wright, Richard A., article in the Automotive News	462
Wydler, Hon. John W., U.S. Representative from New York, statement	442

AUTO SAFETY OVERSIGHT

WEDNESDAY, JULY 19, 1972

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C.

The committee met at 10:10 a.m., in room 5110, New Senate Office Building, Hon. Vance Hartke, presiding.

Present: Senators Hartke, Cook, and Stevens.

OPENING STATEMENT BY SENATOR HARTKE

Senator HARTKE. The committee will come to order. This morning we begin our second round of hearings regarding the National Highway Traffic and Safety Administration's implementation of the National Traffic and Motor Vehical Safety Act of 1966.

The committee's first session was held last month, and focused on the authorization of appropriations for the act. Our purpose at that time was to insure that the National Highway Traffic Safety Administration was authorized sufficient funds to effectively carry out its mandate under the act.

The committee has approved authorization of $51.714 million, that is, $14.314 million more than the administration requested.

The hearings this week and next week are oversight and legislative hearings. Over the course of the next 2 weeks, the Commerce Committee will query NHTSA and other officials with respect to limitation of the act and various amendments to it.

The central theme to which the committee will address itself in these hearings is whether it has been armed with legislative authority necessary to fulfill the mandate of the Motor Vehical Safety Act; that is, does it have the ability to reduce traffic accidents and reduce deaths and injuries to persons resulting from traffic accidents.

The amendments which have been offered to the 1966 act vary greatly in terms of subject matter. One of the most important proposals—S. 2946—would require the manufacturer to repair vehicles at no cost to the consumer upon determination by the Secretary that a safety-related defect exists.

Such a provision was previously approved by the Senate in 1969. It does little good to create a Federal bureaucracy to monitor the safety of motor vehicles if it has no mechanism to require repair. And after all, the goal of the 1966 act is to remove all unsafe cars from the highways.

Another amendment would empower the Secretary to phase in mandatory safety standards. The proposal may be warranted only if it can be achieved without adverse competitive effects.

Staff members assigned to these hearings: S. Lynn Sutcliffe and Edward Cohen.

Two other recommendations to which the committee will address its attention in the next 2 weeks are S. 2582 and S. 3474, relating to schoolbus safety.

Over the course of our hearings, several witnesses will appear to present their analysis of the role NHTSA has played in the past and will play in the future with relation to the safety aspects of schoolbusing.

Of particular interest to the committee is the effect the additional authorization of $1 million for schoolbus crashworthiness research would have on the schoolbus program.

Other amendments to the 1966 act that the committee will receive testimony on include S. 2130, which is to expand access to information contained in the National Driver Register, and S. 3308, to require the establishment of standards relating to rear mounted lighting system.

Finally, the committee will also consider administration amendments to allow the Secretary to conduct investigations relating to motor vehicle accidents, allow for exemptions to motor vehicle safety standards and for other purposes.

The loss of 55,000 lives, the injury of 15.5 million persons, and the waste of $16 billion, each year due to motor vehicle accidents must be halted. The Congress has assigned NHTSA the task of achieving this goal.

At the authorization hearings last month, and again at these oversight legislative hearings, our purpose is to insure that NHTSA is armed with the funds, the legal authority, the dedicated personnel, and the leadership to get the job done.

I would like to give you a caveat for those witnesses who are present this morning, and others who may be planning to appear at the hearings scheduled on these matters.

It is now a matter of public record that Senator Mansfield has indicated that there may not be permission granted to conduct hearings during such time that the Senate is in session over the next 2-week period. In the event that occurs, I hope you will understand that this is completely outside the control of the committee.

Today we will begin these hearings by examining the past and present performance of the administration under the leadership of Mr. Toms, who is our only witness this morning.

It is a pleasure to have you here, Mr. Toms. Senator Cook has a statement to make.

OPENING STATEMENT BY SENATOR COOK

Senator Cook. Thank you, Mr. Chairman. I would like to welcome Mr. Toms to the committee and assure him that the entire committee, as well as the entire Congress, supports the activities of the National Highway Traffic Safety Administration in the field of motor vehicle safety.

Although I have one major area of disagreement with them, particularly in the area of passive restraints, I'd like Mr. Toms to know that I have confidence that we are both working toward the same goal—saving the lives of American drivers.

During the testimony of Mr. Toms today, I will be particularly interested in your comments on the progress which NHTSA has made in the field of passive restraints.

Within the last few months, several well-publicized crashes have been conducted with various types of air bag devices employed to restrain passenger dummies.

On May 23, a test was conducted at Wayne State University in Detroit, in which the air bag failed to work as expected.

On April 18, the DOT sponsored the crash of two ESV's in Phoenix, Ariz., and one air bag failed to deploy entirely. Even in the ESV whose air bag deployed, there seems to be doubt that the dummies would have survived the crash if it had been a real life situation.

Finally, the results of a secret test conducted by your agency on March 31 have not yet been made available.

There seems to be a great deal of question as to the effectiveness of the air bag system in that test.

My office, by the way, has requested results of all these tests, but we have not received any of the information that we requested.

The question that comes through to me is, why are you and others still maintaining such a confident public attitude toward the ability of the air bag to function effectively without the incorporation of seatbelt systems?

The Allstate Insurance Co. has mounted a huge public relations campaign designed to promote the air bag as the lifesaver of the future. However, it is clear to me that in every test conducted by Allstate, passengers were wearing lapbelts in order to provide the secondary assurance that is needed if the air bag failed.

These events prompted me to introduce legislation which would guarantee the continuation of the mandatory seatbelt requirement in all new model cars after the August 15, 1975, date for passive restraints, until such time as actual use by the public can prove that seatbelts provide no safety benefit in addition to that provided by the passive restraints system.

I know that you are aware of the widespread support that I have for this measure, both in the Congress and throughout the country.

With all of this in mind, I would hope that you would explore all these points during the course of your testimony. I would also hope that you will inform this committee of all current NHTSA activity in the passive restraints field, and your present attitude concerning amending motor vehicle standard 208 to retain the mandatory lapbelt requirement after August 15, 1975.

With those points in mind, I would like to commend you and the rest of the National Highway Traffic Safety Administration for your excellent efforts and accomplishments in the field of highway safety.

We commend you and offer our continued support and assistance in your work. Thank you, Mr. Chairman.

Senator HARTKE. I would like to join Senator Cook on this one matter. Everytime I have witnessed an air bag demonstration, it has failed.

Each time, the officials involved indicated that they were embarrassed by the fact that it occurred when I was there. It's not nearly as embarrassing, as Senator Cook and I will agree, to see a dummy get killed as it would be if these were production models.

At this stage of the game, I wonder, along with Senator Cook, why there is such a persistance in following this line. At this hearing, I hope to explore in detail with Mr. Toms, the technical progress that has been made, with the air bag.

Senator COOK. Well, I am going to comment, and then I think we ought to let Mr. Toms testify.

The thing that bothers me, and I think it should bother the agency, is that every time an air bag has been tested up to now, they have been tested under perfect circumstances and perfect conditions.

And yet, that same system, if it were employed in all automobiles throughout the United States, would not be under perfect conditions at all. It would be under conditions where that system might be in an automobile for a year, it might be part of a family with seven kids, it might be part of a situation that would not lend itself to the ideal circumstances.

And what we have to establish is that under the worst of circumstances, the results are going to be very good.

Because we know how people in the United States treat their motor vehicles, and under those circumstances, when they can't work under the best of circumstances, one has to raise serious doubts whether they will work under the worst of circumstances.

Senator HARTKE. Mr. Toms. You may proceed.

STATEMENT OF HON. DOUGLAS W. TOMS, ADMINISTRATOR, NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION; ACCOMPANIED BY LAWRENCE SCHNEIDER, CHIEF COUNSEL; ROBERT CARTER, ASSOCIATE ADMINISTRATOR FOR MOTOR VEHICLE PROGRAMS; AND JACK L. GOLDBERG, ASSOCIATE ADMINISTRATOR FOR PLANNING AND PROGRAMING

Mr. TOMS. Good morning, Mr. Chairman, and Senator Cook. I appreciate the opportunity to testify today with respect to the department's three proposals for amending the National Traffic and Motor Vehicle Safety Act of 1966: S. 3474, which would amend the act to authorize appropriations and make various important substantive and technical changes; a second bill which would authorize the phasing-in of the motor vehicle safety standards; and S. 2130, which would authorize expanded use of the National Driver Register.

This committee and the Congress laid the groundwork almost 6 years ago for a national motor vehicle safety program. Since then, substantial progress has been achieved in making the Nation's highways safer for all Americans.

Through our efforts, and those of others, the number of annual traffic fatalities had begun to stabilize at approximately 55,000 deaths. And the death rate per 100 million vehicle miles traveled was reduced from 5.5 in 1966, to 4.7 in 1971. The 1971 rate was the lowest rate in the history of our Nation's highways.

I regret to report, however, that traffic deaths appear to be occurring in record numbers this year. If the current trend continues, a total of 57,500 traffic deaths will have been recorded for 1972. We are attempting to curb this trend by getting the States, under authority given us under the Highway Safety Act, to substantially increase their traffic

law enforcement efforts. With the help of the Congress, we think we can be successful.

Before discussing our three bills, I would like to review for you two of our most significant ongoing safety efforts as well as some of our plans for the next 3 fiscal years.

As you know, crash survivability is one of our highest priority efforts. It is directed toward increasing vehicle crashworthiness and reducing the likelihood of death or serious injury in crashes. A key element of this effort is the restraint of passengers so that they are not hurled headlong into the vehicle's windshield or dashboard.

The first phase of our effort to provide adequate occupant restraints was the promulgation of motor vehicle safety standards for active seatbelts. These belts are called active because vehicle passengers must take some action to put the belts into use before they will be of benefit.

We issued these standards because crash studies had demonstrated that seatbelt wearers were less likely to be killed or seriously injured than non-seatbelt wearers.

Unfortunately, the anticipated safety benefits of the active belt systems have not been realized. A disappointing 11 out of every 12 vehicle passengers fail to wear both lap and shoulder belts when available. And four out of every five passengers fail to wear even the lap belt.

Consequently, in tens of thousands of crashes each year, people are needlessly endangered, injured or even killed.

We strongly believe that the passive restraint will solve this problem. It is called passive because it does not require any action on the part of the vehicle occupant in order for him to gain the system's full benefits. Thus, the passive restraint avoids the nonusage problem which has plagued active belt systems.

Full passive protection for all passenger car seating positions will not be required until the 1976 model year. To secure the maximum benefit from the nonpassive belt systems which may be installed until that year, manufacturers will be required during the intervening years to incorporate features to stimulate higher usage rates.

Another aspect of the safety problem to which we have given considerable attention in the past year is the schoolbus. Schoolbus fatalities account for less than one-half of 1 percent of the total annual motor vehicle fatalities.

Nevertheless, we firmly believe that certain special measures are warranted to protect the precious cargoes of these vehicles. In early May of this year, we promulgated a new safety standard which will require, effective September 1973, that bus windows be strengthened to prevent passenger ejection during a crash. The windows must also be designed to facilitate escape in the event of an emergency.

At the same time, we issued a new program standard under the Highway Safety Act, which establishes requirements for schoolbus identification, equipment, maintenance, and inspection.

It also specifies requirements for route selection and driver selection and training.

Further, we will be proposing in the near future a new vehicle standard on bus seating to provide increased occupant protection through the heightening and padding of seat backs. The standard will also require the eliminating of hostile surfaces in the seating areas and strengthening of seat anchorages.

The combined effect of these actions will be to improve substantially the safety of all bus passengers, including our schoolchildren.

With respect to our plans through fiscal year 1975, we intend among other things to upgrade the requirements in our existing standards and to extend their applicability to appropriate vehicle categories. To aid in the development of new standards and new motor vehicle safety technology, research and development will be conducted in crash survivability, accident avoidance, and experimental safety vehicles.

Research will also be performed in vehicle crash investigations and information analysis. Increasing attention will be devoted in these ventures to subcompact and compact passenger cars, trucks, and buses.

A vigorous enforcement program is also being planned in order to insure full compliance with all of our safety standards. Compliance testing continues to reveal that some manufacturers are still failing to produce products that meet all applicable standards. Through June 1971, the cumulative failure rate stood at 7 percent.

Increased emphasis will be placed upon the detection of safety-related defects in vehicles and vehicle equipment. To insure that unsafe vehicles are removed from the highways, monitoring of the effectiveness of manufacturer recall campaigns will be increased. To that end, we issued regulations last year requiring manufacturers to report the progress of these campaigns. In addition, we have recently proposed regulations to increase the effectiveness of defect notification letters.

We think we are on the right track in our defects investigation program. During fiscal year 1972, some 14 million motor vehicles were recalled; 11,900,000 of these vehicles were recalled at our urging or as a result of our influence. I might note that during this same period of time, less than 9 million vehicles were manufactured in this country.

I would now like to discuss our three bills. In implementing the National Traffic and Motor Vehicle Safety Act over the past several years, we have discovered various areas in which we could operate more effectively if the act were amended. Our bills are the results of this experience. I urge your careful consideration and support of them.

S. 3474 would extend the authorization for appropriations under the National Traffic and Motor Vehicle Safety Act of 1966 to authorize such funds as are necessary to carry out the purposes of the act. Past authorizations have been restricted to specific amounts in particular years.

We propose changing to a general authorization in recognition of the fact that the emergent nature of the highway safety problem does not lend itself to planning maximum funding several years in advance.

S. 3474 would eliminate much of the difficulty which our multi-disciplinary accident investigation teams have encountered in their vehicle safety research. Hundreds of instances have been reported by the research teams in which they have been unable to obtain the full or even partial cooperation of parties to accidents. Out of apparent fear of possible litigation, these people have declined to discuss their accidents or permit inspection of their vehicles.

To remove these obstacles to safety research, S. 3474 provides that information furnished the Secretary by an individual concerning an

accident would be inadmissible in any subsequent criminal, civil, or administrative proceeding.

Further, any portion of any report of the Secretary relating to such accident or the investigation thereof would also be inadmissible.

These prohibitions would not prevent a party from introducing in a civil action any accident information which he or someone else may have previously furnished the Secretary. They would also not decrease the public availability of the safety research reports.

S. 3474 would also authorize the Secretary's agents to inspect crashed motor vehicles or temporarily impound them for the purpose of inspection. This authority would insure that the research teams could preserve and inspect the postcrash condition of motor vehicles. The bill would also authorize the Secretary's agents to enter any premises to conduct the inspection or to impound the vehicles.

We are also proposing in S. 3474 the renewal of the Secretary's authority to exempt certain motor vehicle manufacturers from the standards for periods of up to 3 years. The previous exemption authority expired in April 1971. We believe that renewal is desirable because the low-volume manufacturers are still subject to the same handicaps which were the rationale for the original exemption authority. Without the availability of exemptions, these manufacturers might be forced to cease production.

The renewed authority would permit exemptions for economic hardship, the development of new propulsion systems, or the incorporation of new safety features.

Manufacturers whose annual production volume does not exceed 10,000 vehicles would be eligible for these exemptions. To promote public participation in the exemption process, our bill would require that notice of each exemption application and each granting of an exemption be published in the Federal Register.

I would also like to urge your early action on two other bills we have proposed. Our phase-in proposal would authorize the Secretary to set a schedule of dates according to which manufacturers must make increasing proportions of their production conform to a particular safety standard. At the present time, we are required to set a single effective date for a new motor vehicle safety standard.

This date must be sufficiently far in the future to enable all manufacturers to achieve compliance with their entire production. This new authority would permit us to phase-in a standard over a period of years, thereby resulting in the production of safer vehicles at earlier dates than was otherwise possible. Not every standard would be promulgated using the phase-in approach.

Our third bill, S. 2130, would expand the use of the National Driver Register. As you know, the Register is a central clearinghouse in which the States file reports of driver license suspensions, revocations and denials. The States retrieve the reports under carefully regulated conditions in connection with driver license applications.

Our bill would increase the value of the Register for controlling problem drivers in two ways. It would authorize a judge to query the Register for information useful to him in sentencing an individual convicted of a traffic law offense. This would permit more effective sentencing of first, second and multiple offenders.

In addition, our bill would authorize employers to use the Register to determine whether an applicant for employment as a driver has a history of license revocations.

Mr. Chairman and members of the committee, this concludes my statement. I would be pleased to answer any questions that you may have.

Senator HARTKE. Thank you, Mr. Toms. During our authorization hearings last month, one witness stated that although NHTSA spends millions of dollars annually on research, the results of this research are not always translated into standards.

To test this assertion, I have invited Mr. Ira J. Furman, director of communications for the Consumers Union, to appear before the committee at this time, and review findings with respect to the inadequacies of the child restraint standard.

Following his presentation, we will ask some other questions in the general area of research and standards.

STATEMENT OF IRA J. FURMAN, DIRECTOR OF COMMUNICATIONS, CONSUMERS UNION, MOUNT VERNON, N.Y.

Mr. FURMAN. Let me introduce the film for a moment.

Consumers Union has called for improved Federal standards for children's car seats, saying its tests showed most such devices shockingly inadequate in a 30-mile-per-hour barrier crash.

All of the car seats Consumers Union tested were labeled as having complied with the applicable Federal standard, yet 12 of the 15 were judged not acceptable. And two of the three acceptable models were considered poor.

Tests of the seats that failed to protect CU's test dummy showed they would allow a typical 3-year-old child's head to slam into the dashboard, distort the child's spine, or allow the seatbelts to dig into the abdomen, thus possibly causing serious internal injuries.

For each of the crash tests, Consumers Union secured a child restraint to the auto seat according to the manufacturer's instructions. The dummy representing a 3-year-old, 37½-inch-tall, 31-pound child was placed into each child restraint in accordance with the manufacturer's instructions. Instrumentation on the dummy's head and chest measured deceleration upon impact of the crash sled.

CU's judgment is that to give adequate crash protection, a child restraint must keep its occupant's head from striking any hostile surface inside the car, and must limit deceleration force.

A small child, having a relatively heavy head and fragile skull, is most likely to suffer serious injury or death in a car accident if his head strikes the instrument panel or windshield. Accordingly, CU immediately failed any restraint that allowed the test dummy's head to make such contact.

You will notice that some of the test car seats collapsed and left the test dummy in a jackknifed position. With one, the harness buckle was burried in the abdomen and could not be released. In still others, the adult seatbelt imposed loads on the dummy judged to be very high.

In addition to car seats, Consumers Union also tested a harness and an infant carrier. Both were judged acceptable. The infant carrier is distributed by General Motors.

The tested harness consists of a net vest with restraining straps fastened to an anchor belt which is attached permanently to the car floor. It is covered by a Federal standard (No. 209) which pertains to seatbelts. The acceptable model is Sears Child Safety Harness, catalog No. 6401.

The best of the tested car seats—covered by Federal standard No. 213—was judged to be the Ford Tot Guard, a product of the Ford Motor Co. It, and the Sears Harness, are recommended by CU for children old enough to sit up, but too young to use adult lap belts. The GM Infant Carrier is rated good for infants up to 8 months old or 20 pounds.

Consumers Union would like to emphasize that adult seatbelts are not a satisfactory alternative to a good restraint for small children. According to medical experts, it said, children under the age of 4 or weighing less than 40 pounds should not wear a conventional lap belt.

Insufficiently developed pelvic bones could let the belt slip up over the child's abdomen, where it could cause internal injuries in an accident. Children shorter than 55 inches should not wear shoulder belts; the webbing would ride too high and could injure the child's neck.

I will now show you slow-motion, 1,000-frame-per-second films.

Senator HARTKE. Let me say, for the benefit of those people in the room, if you care to move over, we will permit you.

The committee will recess for a few minutes.

(Short recess.)

(Film.)

Mr. FURMAN. What we are seeing now is a device which is typical of the raised tubular construction of these models. There is little support for the dummy's upper torso, and the head goes full face into the instrument panel.

The seat is not strong enough to handle the force, and its tubular construction collapses.

The second one is another device of the same tubular construction. As it collapses, the dummy's head strikes the instrument panel, which could cause severe head injuries.

A small child is most likely to suffer serious injury or death in a car accident if his head strikes the instrument panel or windshield.

Note that this is up off the seat. That is what we are talking about when we say raised tubular construction. Those were two different models.

This is a third model, another raised car seat, but this model has a lap belt across the seat, not across the seat and the child.

As the seat collapses, it wedges the jackknifed dummy inside, pulling the lap and torso straps tight, and in this one, we weren't able to open the seatbelts.

Senator STEVENS. Could you go back over that one again?

Mr. FURMAN. Sure.

Senator STEVENS. I don't see the seatbelt. It looks like you only have that tied with a string.

Mr. FURMAN. That belt secures only the seat, and not the seat and child.

Senator STEVENS. The seatbelt goes over the back of the seat.

Senator HARTKE. What do you want to know?

Senator STEVENS. It's just tied with a string. The ones I have seen have a belt that comes across and hooks into the seatbelt and a cord at the bottom, is that not so?

Mr. FURMAN. In this model the seatbelt goes across the seat, but behind the child on it, and secures only the seat, and not the seat and the child.

Senator STEVENS. There's nothing wrong with the top part.

Mr. FURMAN. Not on this model.

Senator STEVENS. Thank you.

Mr. FURMAN. At least that is my understanding. You see the seatbelt.

This is a simulation of a barrier crash at 30 miles per hour.

Now this model we consider atypical, in that it rests on the automobile seat, instead of being raised above it.

In this case, the child's head doesn't hit the instrument panel, but forces on the shoulderbelt—that is, the shoulderbelt of the seat—cause the seat back to break completely off.

The child remains restrained only by a lapbelt, and would likely suffer severe abdominal injuries.

Now what we are seeing is the Ford Tot Guard, which is the best of the child seats judged acceptable by Consumers Union.

Upon impact, the dummy moves forward as the adult belt stretches. The dummy goes straight forward, supported by the chest and fact protectors. The dummy does not hit the instrument panel.

The Tot Guard is a molded plastic shell device which encapsulates the child and is held in place by the adult lapbelt.

Senator HARTKE. You say this is the most acceptable?

Mr. FURMAN. Yes, this is the most acceptable, right. The only one we would recommend of the seats.

This next one is the Sears Child Safety Harness, also judged acceptable. In the harness, the child moves straight forward and straight back. There is no rotation, no twisting, and the child doesn't hit anything.

Here we see the General Motors Infant Carrier. This is not covered by any Federal standards, but we tested it out anyhow.

In this one, the infant faces the rear. Upon impact, it is protected by the shell of the carrier, rebounds against the padded car seat, but is not likely to suffer any serious injury.

Now we see the General Motors Infant Carrier at a 20-mile-per-hour near crash. We judge it is a fairly acceptable ride, cushioned by the Infant Carrier, and seat back. Again, that is 20 miles an hour. The forward crashes were 30 miles per hour; that is, a 30-mile-an-hour barrier crash.

That's it.

Senator HARTKE. All right; thank you, Mr. Furman. These deal with MVSS No. 213. Mr. Toms, as I indicated previously, I would like to afford you the opportunity to make any comments you deem appropriate at this time.

Mr. TOMS. Thank you, Mr. Chairman, and members of the committee.

First, let me compliment CU. The NHTSA has been concerned about child seating systems for a long time, but this problem has been difficult to publicize properly.

You may recall, Mr. Chairman, we released films very similar to these about a year ago. Although they received some use, it was not sufficient to acquaint the public with the problem.

Consumers Union is performing an important service by their magazine and other techniques to present this information to the public.

There are, however, some problems in their release. CU did this work at the University of Michigan with the same people who are under contract with us to develop a dynamic test for child seating systems.

That report from the University of Michigan is not in yet. We are naturally concerned. While we recognize CU's desire for recognition in this field, it still is necessary for the NHTSA to receive the report from the University of Michigan before we judge what kind of a dynamic test is required.

Bob Carter, who has been monitoring this study would like to make a few remarks about the technicalities involved.

Mr. CARTER. Mr. Chairman, I would like to review the chronology.

On the 28th of June, we made our first contract with the University of Michigan. Part of that contract addressed the child seating problem.

The contract specifically required that they study all the child seats on the market and recommend a dynamic compliance test procedure.

The results of that contract were such that we could not develop the dynamic test procedure. Hence, on the 27th of August 1969, we greatly expanded the child seat effort. The film on this subject that you saw a year ago was a film that came from the August 1969 contract with the University of Michigan.

That contract called for recommended performance requirements and compliance test procedures for child seating systems. However, once again, our objective was not met.

We received a final report on the contract in October 1970. After studying this report, we decided to try again. We went to the University of Michigan and we signed a contract with them on 30th of June of 1971, requesting a dynamic test and related compliance procedure. The contract completion date is the 30th of August 1972.

It is my understanding, as Mr. Toms has pointed out, that the film of the tests you just saw were conducted when our tests were run.

Even so, we are waiting for a recommendation from the University of Michigan as to what the compliance test procedure and the dynamic test procedure should be.

Senator HARTKE. At this time, I would like to insert standard 213 in the record. We will do that.

(The material follows:)

MOTOR VEHICLE SAFETY STANDARD NO. 213—CHILD SEATING SYSTEMS

(Docket No. 2–15)

S1. Purpose and scope.—This standard specifies requirements for child seating systems to minimize the likelihood of death and injury to children in vehicle crashes or sudden stops by ejection from the vehicle, contact with the vehicle interior, or contact with a child seating system.

S2. Application.—This standard applies to child seating systems for use in passenger cars, multipurpose passenger vehicles, trucks, and buses. This standard does not apply to Type 3 seat belt assemblies, as defined in Federal Motor Vehicle Safety Standard No. 209, or to systems for use only by recumbent or semirecumbent children.

S3. Definition.—"Child seating system" means an item of motor vehicle equipment for seating and restraining a child being transported in a motor vehicle.

S4. Requirements.

S4.1. Labeling.—Each child seating system shall have a label permanently affixed to it. The label shall contain the following information in the English language in letters and numerals is not less than $^{3}/_{32}$-inch high;

(*a*) The manufacturer's name. However, a distributor's name may be placed on the label in place of the manufacturer's name if the distributor assumes responsibility for all duties and liabilities imposed on the manufacturer by the National Traffic and Motor Vehicle Safety Act with respect to the system.

(*b*) Model number or name.

(*c*) Month and year of manufacture.

(*d*) Place of manufacture (city and State or foreign country). However, if the label contains the distributor's name in place of the name of the manufacturer, the city and State or foreign country of the distributor's principal offices shall appear on the label.

(*e*) A statement describing in general terms both the types of motor vehicles and the designated seating positions in those vehicles in which the system is either recommended or not recommended for use. The following, either stated separately or in combination, are examples of acceptable statements:

(1) "Recommended for use only on bench seats of passenger cars manufactured after January 1, 1968, by the ———— Motor Company."

(2) "Recommended for use only on seats that have head restraints on (make or model designation(s)) passenger cars manufactured after January 1, 1969."

(3) "Not recommended for use in trucks and buses."

(*f*) Except as provided in S4.1.1, the following statement: "Not for use on hinged or folding vehicle seats or seat backs unless the seat or seat back is equipped with a latch."

(*g*) Unless the system is a rearward-facing child seating system, the following statement: "For use only on forward-facing vehicle seats."

(*h*) The following statement, inserting in the blank spaces the manufacturer's recommendations of the maximum height and the minimum and maximum weight of children who can safely occupy the system: "For use only by children who weigh between ——— and ——— pounds and whose height is ——— inches or less."

S4.1.1 Exemption.—A part of the warning required by S4.1(f) relating to use of a child seating system on a hinged or folding vehicle seat or on a vehicle seat having a hinged or folding back, or on both, may be omitted in the following circumstances:

(a) The part of the warning that relates to vehicle seats may be omitted if the child seating system includes a component to restrain a hinged or folding vehicle seat and if, when the system and the component are both installed in the seat in accordance with the recommendation required by S4.1(e) and the instructions required by S4.2, the component will not fail when a forward longitudinal force equal to 20 times the weight of the vehicle seat is applied through the seat's center of gravity and maintained for 10 seconds.

(b) The part of the warning that relates to seat backs may be omitted if the child seating system includes a component to restrain the hinged or folding seat back and if, when the system and the component are both installed in the vehicle seat in accordance with the recommendation required by S4.1(e) and the instructions required by S4.2, the component will not fail when a forward longitudinal force equal to 20 times the weight of the vehicle seat back is applied through the back's center of gravity and maintained for 10 seconds.

(c) The entire warning may be omitted if the child seating system includes the components for restraining the seat and seat back specified in (a) and (b).

S4.2 Installation instructions.—Each child seating system shall be accompanied by an instruction sheet, providing a step-by-step procedure (which may include diagrams) for installing the system in the vehicle in which it is recommended for use in accordance with S4.1(e), securing the system with a Type 1 or Type 2 seat belt assembly, positioning a child in the system, and adjusting the system to fit the child.

S4.3 Adjustment.—The components of each child seating system which directly restrain the child shall be adjustable to fit any child whose weight and height are within the ranges recommended in accordance with S4.1(h) and who is positioned in the system in accordance with the instructions required by S4.2.

S4.4 Attachment.—Each child seating system shall be designed and constructed so that—

(*a*) the system has no provision for attachment to a vehicle seat back other than by means of a component which is inserted between the vehicle seat back and the vehicle seat cushion; and

(*b*) when installed in accordance with the instructions required by S4.2, a system installed on a forward-facing vehicle seat shall be restrained against forward movement, and a system installed on a rearward-facing vehicle seat shall be restrained against rearward movement, by a Type 1 or Type 2 seat belt assembly as defined in Federal Motor Vehicle Safety Standard No. 209.

S4.5 Distribtion of restraint forces.

S4.5.1 Forward-facing systems.—When a forward-facing child seating system is installed in a vehicle and a child is positioned in the system in accordance with the instructions required by S4.2, components of the child seating system and the vehicle's seat belt assemblies which apply restraining forces directly to the child shall, during forward movement of the child relative to the vehicle in which the system is installed, distribute those forces on both the pelvis and thorax of the child. Restraint forces may also be distributed over other areas of the child's body as long as both the pelvis and thorax are restrained.

S4.5.2 Rearward-facing systems.—When a rearward-facing child seating system is installed in a vehicle and a child is positioned in the system in accordance with the instructions required by S4.2, the components of the child seating system and the vehicle's seat belt assemblies that apply restraining forces directly to the child shall—

(*a*) during forward movement of the child relative to the vehicle in which the system is installed, distribute those forces on both the back of the child's torso and the back of the child's head; and

(*b*) during rearward movement of the child relative to the vehicle in which the system is installed, distribute those forces on both the pelvis and thorax of the child.

Restraint forces may also be distributed over other areas of the child's body as long as both the back of the torso and head are restrained during forward movement and both the pelvis and thorax are restrained during rearward movement.

S4.6 Head restraint

S4.6.1.—Except as provided in S4.6.2 each forward-facing child seating system shall have a head restraint that limits rearward angular displacement of the child's head relative to the child's torso line. The height of the head restraint, measured as the straight-line distance between the highest point at the lateral center of the head restraint and the lowest point at the lateral center of the seating surface, shall be as follows:

[The height of the head restraint shall be at least: (inches)]

If the maximum weight of children for whom the system is recommended is:	
20 pounds or less	15
More than 20 pounds but not more than 25 pounds	16.2
More than 25 pounds but not more than 30 pounds	17.9
More than 30 pounds but not more than 35 pounds	18.9
More than 35 pounds	20

(36 F.R. 6895—April 10, 1971. Effective: 4/10/71).

S4.6.2.—Subparagraph S4.6.1 does not apply to a child seating system if—

(*a*) In accordance with S4.1(e), the system is recommended for use only at designated seating positions in makes and models of vehicles at which the vehicle's seat back or head restraint limits rearward angular displacement of the child's head relative to the child's torso line; and

(*b*) When the system is installed in accordance with the instructions required by S4.2, the distance from the lowest point at the lateral center of the child seating surface to a horizontal plane tangent to the highest point of the vehicle seat back or head restraint in its highest adjustable position, at the lateral center of the designated seating position, measured on a line parallel to the rear surface of the vehicle seat back, is at least equal to the seat back height specified for the seating system in S4.6.1.

S4.7 Webbing.—If a child seating system has webbing to distribute restraint forces as required by S4.5—

(*a*) the webbing that directly contacts the child's body shall have a minimum width of 1½ inches; and

(*b*) the webbing that sustains restraint forces shall meet the requirements for webbing in a Type 3 seat belt assembly specified in paragraphs S4.2(b) through S4.2(h) of the Federal Motor Vehicle Safety Standard No. 209.

S4.8 Hardware.—Attachment hardware of each child seating system that sustains restraint forces shall meet the corrosion resistance requirement for attachment hardware of a seat belt assembly specified in paragraph S4.3(a) of Federal Motor Vehicle Safety Standard No. 209. Buckles, retractors, and metallic parts other than attachment hardware that sustain restraint forces shall meet the corrison resistance requirements for buckles, retractors, and metallic parts other than attachment hardware of a seat belt assembly specified in paragraph S4.3(a) of Federal Motor Vehicle Safety Standard No. 209.

S4.9 Release Mechanism.—The mechanism for releasing components of a child seating system that directly restrains the child shall—

(*a*) Meet the requirements for the buckle of a Type 3 seat belt assembly specified in S4.3(d) of Federal Motor Vehicle Safety Standard No. 209, except that the assembly test force specified in S5.3(c)(2) of Standard No. 209 shall be 1,000 pounds; or

(*b*) Release when a force of not more than 20 pounds is applied when tested in accordance with S5.3 (36 F.R. 6895—April 10, 1971. Effective: 4/10/71)

S4.10 Impact protection.

S4.10.1 Head.—Each rigid component of a child seating system that, during forward, right-side, left-side or rearward impact, may contact the head of a child within the weight and height range recommended in accordance with S4.1(h) who is positioned in the system in accordance with the instructions required by S4.2, shall—

(*a*) Have no corner or edge with a radius of less than one-quarter inch; and

(*b*) Except as provided in S4.10.3, be covered with deformable, nonrecovery, or slow-recovery energy absorbing material having a thickness of at least one-half inch.

S4.10.2 Torso.—Except as provided in S4.10.3 each rigid component of a child seating system (except restraint belt buckles) that, during forward, right-side, or left-side impact, may contact the torso of a child within the weight and height range recommended in accordance with S4.1(h) shall comply with the requirements of S4.10.1.

S4.10.3 Exception.—S4.10.1(b) does not apply to a rigid side of a child seating system if the contactable area of the side that is higher than the system's seating surface is at least 24 square inches.

S4.11 Performance.

S4.11.1 All child seating systems.

(*a*) When tested in accordance with S5.1 each child seating system shall—

(1) Retain the torso block in the system;

(2) Sustain a static load of 1,000 pounds in the forward direction; and

(3) Restrict forward horizontal movement of the torso block reference point:

(i) When the vehicle seat is in its forwardmost adjustment position, to not more than 12 inches;

(ii) When the vehicle seat is rearward of its forwardmost adjustment position, to not more than 12 inches plus the distance, measure horizontally, that the vehicle seat is rearward of its forwardmost adjustment position. (36 F.R. 12224—June 29, 1971. Effective: 6/29/71)

(*b*) A child seating system in which the attitude of the child is adjustable pursuant to the instructions provided in accordance with paragraph S4.2 shall meet these requirements at each designated adjustment position.

S. 4.11.2 Rearward-facing child seating systems.

(*a*) When tested in accordance with S5.2, each rearward-facing child seating system shall—

(1) Retain the torso block in the system;

(2) Sustain a static load of 500 pounds in the rearward direction; and

(3) Restrict rearward horizontal movement of the torso block reference point to 12 inches or less.

(*b*) A child seating sytsem in which the attitude of the child is adjustable pursuant to the instructions provided in accordance with the paragraph S4.2 shall meet these requirements at each designed adjustment position.

S5 Demonstration procedures.

S5.1 All seating systems.—The child seating system shall be subjected to a static load, using the torso block shown in Figure 6 of Federal Motor Vehicle Safety Standard No. 209, as follows:

(*a*) Locate the torso block reference point, which is 2.9 inches above the bottom surface of the torso block and 2.1 inches forward of the back surface of the torso block.

(*b*) Install the system in accordance with the manufacturer's instructions required by S4.2 on a vehicle seat other than a seat on which the manufacturer does not recommend its installation in the recommendation required by S4.1(e).

(*c*) Position the torso block in the system in accordance with the manufacturer's instructions required by S4.2, and adjust the system in accordance with those instructions.

(*d*) Apply an increasing load to the torso block in a forward direction, not more than 15° and not less than 5° above the horizontal, until a load of 1,000 pounds is achieved. The intersection of the load application line and the back surface of the torso block, at the time that the force removes the slack from the load application system, shall not be more than 8 inches or less than 6 inches above the bottom surface of the torso block. Maintain the 1,000-pound load for 10 seconds.

(*e*) Measure the horizontal movement of the torso block reference point.

S5.2 Rearward-facing child seating systems.—The rearward-facing seating system shall be subjected to the demonstration procedure specified in S5.1, except that—

S5.3 Release mechanism.—Conduct the following tests for forward-facing and rearward-facing child seating systems, as appropriate, using a torso block configured so that it does not contact the buckle in a manner as to affect the buckle release force.

S5.3.1—For forward-facing child seating systems—

(*a*) Test the system with a 500-pound force as specified in S5.2;

(*b*) Reduce the force to 45 pounds; and

(*c*) Release the mechanism in a manner typical of that employed in actual use.

S5.3.2.—For rearward-facing child seating systems—

(*a*) Test the system with a 500-pound force as specified in S5.2;

(*b*) Reduce the force to 45 pounds; and

(*c*) Release the mechanism in a manner typical of that employed in actual use. (36 F.R. 6895—April 10, 1971. Effective: 4/10/71)

35 F.R. 14778.
September 23, 1970.

Senator HARTKE. Standard 213 was adopted in May of 1971, correct?

Mr. SCHNEIDER. That is correct, Mr. Chairman.

Senator HARTKE. This relates to the standard for child restraint systems, is that correct?

Mr. SCHNEIDER. Yes.

Mr. CARTER. That is correct, Mr. Chairman.

Senator HARTKE. It requires only a static testing system, rather than dynamic testing system, correct?

Mr. CARTER. That is correct.

Senator HARTKE. In your report which was given to us, dated October 31, 1970, almost 6 months earlier, the University of Michigan research group documented the necessity of a dynamic method, did they not?

Mr. CARTER. Yes, Mr. Chairman. From the tests that you saw, today, it is obvious that we need a dynamic test. However, the University of Michigan research group was not able to recommend a specific test.

Senator HARTKE. Yes, I understand.

But you have adopted a child restraint system with a static test, right?

Mr. CARTER. That is correct, sir.

Senator HARTKE. Which leaves the impression with the public that this is a safe restraint system.

We are not playing games. This is not among the games that people play.

We are trying to go ahead and provide adequate protection for children, without having any success. What we want to do is have something successful in eliminating deaths.

We just learned that a famous musicion was killed yesterday, with his two children. It was not in the United States, but this prospect of auto accidents is constantly hammering into people's minds.

The death rate on the highway has become so massive that we have become immune to it—in fact, very few people are willing to get excited about automobile safety. I am disturbed about that, because it demonstrates a lack of understanding of the need to take this matter seriously.

And yet it's leaving a false impression. In other words, it is the old idea that it's easier to mislead with a half truth than it is with an outright lie.

Mr. SCHNEIDER. There was no intent to mislead. Everyone in the safety field had long recognized that the choice facing us was either to wait and have no standard at all until a dynamic test could be developed, or to take a two-step approach, which we chose to do.

The first step was a standard with a static test. We recognize the shortcomings, bue we also recognize, as we wrote to Mr. Sam Beck yesterday, in connection with these tests, that it does provide impact protection for children that would not otherwise be available.

What should we have, no child seating systems standard at all?

Senator HARTKE. All right, I am willing to accept that. If you can show me that this has value, I am not going to be critical of you. In this whole field, as you know, Mr. Toms, I have constantly said to you that if you will tell me what you need, I am more than ready to try to help you get the job done.

My purpose here is to find the reason for adopting a static test in this situation, and how can it be justified in the interest of safety for children?

Mr. TOMS. One of he factors that should be mentioned, Mr. Chairman, is that as long as a year ago, and perhaps to some extent, today, there were all kinds of very flimsy wire shield seating mechanisms, many of which fit over the back of the front seat.

The static requirements imposed by this rule were, among other things, designed to get rid of such flimsy seats. As you may recall, we received a barrage of criticism from the people who had these devices for sale and had to withdraw them from the market.

So, the first step was to get off the market all the flimsy child seats that were many times worse than those which have just been recently tested.

What Mr. Schneider said aptly describes the situation. Some great strides have been taken; the first of which was to get the really flimsy seats off the market and to get some minimum requirements, while, at the same time, moving toward a dynamic test.

Mr. SCHNEIDER. We don't disagree with Consumers Union in regard to the need for dynamic tests, Mr. Chairman. Mr. Carter attempted to relate that we have already spent a considerable amount of

money trying to develop a dynamic test. The same party that tested for Consumers Union is also under contract to us.

They have told us informally that the test they used for CU, they are not prepared to recommend to us as an adequate dynamic test.

Senator HARTKE. I don't want to take issue with you, but I have the written statement from that report which says exactly the opposite.

Mr. TOMS. If that is the case, Mr. Chairman, you should ask the people from the University of Michigan to come here and set the record straight.

Senator HARTKE. We will do this if it is necessary.

I will read to you from page 41 of the October 1970 University of Michigan report:

It is felt that a dynamic test requirement is required to determine child occupant restraint performance, and that enough information is available to write a dynamic test standard.

Mr. TOMS. When the report is in, there will be a dynamic test.

Senator HARTKE. It does not say that. I am going to read it to you again. I am not saying that it is true but I simply want to ask you about what the report says. Once again, this is the final report of the University of Michigan's Highway Safety Research Institute, October 31, 1970. I will read the whole paragraph to keep it in context.

A test procedure such as this can be carried out within one day on any one of the several governmental, industry, university and private research organizations operating sleds which are located in this country.

And then I will repeat again:

It is felt that a dynamic test requirement is required to determine occupant restraint performance—

Which is the central theme—

and that enough information is available to write a dynamic test standard.

What bothers me is very simply that they are saying in order to have safety for a child, a dynamic restraint performance test is required.

Mr. CARTER. Yes, Mr. Chairman, we agree completely on the need for such a test.

Senator HARTKE. Now I grant you that a lot of these other systems are junk. But to replace one inadequate system with another inadequate system, in order to take the heat off you, is not, in my judgment, the proper function of the agency.

Mr. TOMS. Another factor we should remember is that until 6 months ago, we had much difficulty finding any child seating devices available for sale in the United States that would even meet the static requirements.

Senator HARTKE. I think it is a whole lot better to know that there is not available any type of device that is adequate for child safety restraint. Then you are not left with the impression that this here is an instrument that provides safety, which it really doesn't.

And you know what I am driving at.

Mr. TOMS. Yes, Mr. Chairman. What we are all saying is that we recognize the need for a dynamic test. The issue, however, is how rapidly a dynamic test can be developed, and how quickly can child seats that might pass such a dynamic test be brought to the market.

(The following information was subsequently received for the record:)

Child Seating Systems

The Highway Safety Research Institute, of the University of Michigan report of October 31, 1970, strongly recommends the adoption of dynamic tests for child restraint systems. However, the same report cites a number of problems and questions that require research before a dynamic test procedure can be implemented. The following are examples of these:

DUMMIES

No complete answer can yet be given to the question concerning the accurate duplication of human kinematics by dummies.

CHILD ANTHROPOMETRICS

This whole problem demonstrates the substantial lack of data on children and babies. To start with, adequate anthropometric data necessary to construct human simulators is only just now becoming available.

CHILD TOLERANCE

Although some data is available for adults, equivalent data for children is not yet available. Further, "some medical people are of the opinion that the greater compliance of a child leads to better resistance to impact. Others state that this lack of development of bony structures creates lessened resistance."

A dynamic test procedure for child restraint systems consists of a number of elements namely (1) a device or devices to be used to stimulate the occupant (dummies), (2) an environment to simulate the vehicle interior, (3) a motion environment to simulate the crash characteristics of the vehicle and (4) a performance evaluation criteria with which to evaluate the results. Each of these elements will be discussed briefly below.

(1) *Dummies.*—It was the case and it is still the case that much needs to be done in the area of child dummies. First, there are only two devices available on the market, both manufactured by Sierra Engineering Corporation. One is said to be a representation of a three-year old child and the other is said to be a representation of a six-year old child. There is no clear definition of what stage of child development these devices are intended to represent. There is no data to support the physical dimensions and weight distribution that these devices possess. It is known that these devices lack realism in certain critical areas such. as (1) the dynamic response of the child-dummys' necks, (3) the compliance of the dummys' chest and abdomen and (4) the response of the dummies head to impact loads.

At the time of the HSRI report there was no device available on the market for simulating the infant. Since that report, work has been conducted to develop a first generation infant dummy, but its design has yet to be completed.

(2) *Physical Environment.*—The manufacturer of child restraint systems must make his device adaptable to a variety of automobiles in order to have a marketable item. Thus, a dynamic test procedure must address the question of what type of vehicle interior to use. The two important features of the vehicle interior are (a) the geometry and "softness" of the seat and (b) the proximity of the dash and door structure (the space envelop). At the time of the HSRI report, we did not know what differences existed in the vehicle seat characteristics and to what existent these differences were critical. Also the variations in the "space envelop" from vehicle to vehicle were not defined.

(3) *Motion Environment.*—A conclusion of the HSRI study was that dynamic tests should be performed on child restraint systems to simulate a 30 mph frontal impact, a 20 mph rear impact, and a 20 mph side impact. While a limited amount of data existed at that time on the vehicle compartment deceleration pulses that result from such crashes, questions existed and stiil exist as to what variations in selected deceleration profiles can be permitted for compliance test purposes, without significantly changing the results of the tests. The questions of what deceleration profiles to use in dynamic testing and to what extent variations would be exceptable have yet to be completely resolved.

(4) *Performance Evaluation Criteria.*—Perhaps the biggest hindrance to a dynamic compliance test definition is the lack of data on what motions and forces are injurious to a child. To quote the HSRI report ". . . because of the lack of data on impact tolerance, only preliminary suggestions can be made for allowable loadings which can be safety experienced by the child". The HSRI

report goes on to suggest performance requirements in Part V of the report. Each of the recommendations is discussed briefly below.

(1) *Motion Criteria.*—The author recommends that the motion of the occupant be limited to a volume above the sea cushion of the adult seat. This criteria would prevent harmful contact with vehicle interior surfaces but it is perhaps too conservative and hence, difficult to defend. By restricting motion one effectively raises the average acceleration levels which must be applied to the child occupant. Thus it is desirable to permit as much motion to the child as can be justified based on the proximity of hard surfaces such as the door or dashboard.

(2) *Load Distribution.*—It is important to insure that child restraint devices distribute restraining loads on as wide an area of the child's body as possible. While assessing the adequacy or inadequacy of load distribution can be done by experts in the field such as HSRI, defining load distribution in a standard is very difficult. The authors suggest a pressure criteria but quickly point out that "the major problems with this type of specification are a lack of tolerance data and a lack of instrumentation techniques for the measurement of contact pressures between surfaces".

(3) *Acceleration Criteria.*—HSRI recommended that estimated adult tolerances be used for chest and head accelerations. Even if one acceps the assumptions of his technique, the measurement of acceleration on the existing child dummies is questionable due to the differences in impact response between the dummies and the child that it is supposed to represent.

In summary there were many questions to be resolved at the time of the subject HSRI report in order to define a reasonable dynamic compliance test for child restraints. It was the objective of our subsequent contract with HSRI, initiated in June 1971, to come to grips with these problems.

CHILD SEATING SYSTEMS

The Highway Safety Research Institute of the University of Michigan is developing a compliance test procedure for child restraint systems under contract to the National Highway Traffic Safey Administration. This work is expected to be completed by August 30, 1972. Required output from this contract includes definition of specific performance requirements for child restraint systems; established specific requirements, peculiar to various stages of child development; definition of the related compliance test procedure and equipment; and fabrication of the child restraint compliance test set up; and development of an approved compliance test procedure.

On June 30, 1971, the Highway Safety Research Institute of the University of Michigan entered into a contract with the National Highway Traffic Safety Administration to develop a dynamic compliance test procedure for child restraint systems. Specific items called for in the work statement are as follows:

1. To "define specific performance requirements for child restraint systems . . ."
2. To establish specific requirements, peculiar to "various stages of child development . . ."
3. To "define the related compliance test procedure and equipment . . ."
4. To "develop the approved compliance test procedure . . ."; and
5. "fabrication of the child restraint compliance test set up . . ."

The tests conducted for Consumers Union utilized identical test equipment, procedures, and in many cases the same child restraint system as are being used to evaluate and finalize the development of the dynamic test procedure for the National Highway Traffic Safety Administration. It is expected that the Highway Safety Research Institute of the University of Michigan will examine the results of both test series and modify their recommendations to the National Highway Traffic Safety Administration to overcome any problem encountered.

To briefly summarize, one must (1) have a family of devices that simulate the critical characteristics of a range of child occupants at various stages of development, (2) be able to define a vehicle interior as an environment for the device being tested (3) be able to define a motion environment to simulate particular critical crash modes and (4) be able to define a performance evaluation criteria with which to evaluate the results.

The basic objective of the compliance test is to ensure a level of crash survivability to the child occupant. Injury can result from two basic causes. First, the child can strike portions of the car interior at injurious velocities. Secondly, the device itself can produce injuries. To prevent the first mode of injury it is necessary to place restrictions on the amount of travel experienced

by the occupant during simulated crashes. This is the easiest mode of injury to legislate out but in so doing it is possible to increase the incidence of the second mode of injury, that due to the device itself, if care is not taken to ensure that restraint loads are well distributed and not excessive. In trying to define what are acceptable loads and what is good load distribution one is confronted with a dearth of biomechanic data relative to child tolerances. Nevertheless, the Administration feels that a first generation dynamic compliance test can be written in the near future based on the research at HSRI that has been underway since June 1971. The Administration has every intention of issuing a notice of such a rule at the end of this calendar year as indicated in the MVP program plan issued in October 1971.

Senator HARTKE. Yes.

Can I ask you and Mr. Purman to both listen, and both of you answer this.

The one device as I recall that passed was from Ford?

Mr. TOMS. Yes, the Tot Guard.

Senator HARTKE. It did provide protection under dynamic conditions.

Mr. TOMS. Correct.

Senator HARTKE. Why couldn't you go ahead and say that you have to have something similar to that?

Mr. TOMS. We want to leave the manufacturers with flexibility to develop increasingly better systems. I personally have said that in my judgment this is one of the best, and more manufacturers should develop a system that performs as well as to Tot Guard.

Senator HARTKE. The problem is, you set a standard which does not insist on having that type of result.

Mr. TOMS. One of the problem the manufacturers face, however, is that a lot of children don't like that kind of seat.

Senator HARTKE. Wait a minute. Children don't like to have their teeth operated on, either.

Senator COOK. Wait a minute, Mr. Chairman. All you have to do is have a child who doesn't like that Ford seat for three of four rides, and all of a sudden you are going to be without a seat, just as people go without seatbelts.

You and I can sit here and say this all we want to, but statistics in your statement pretty well explained the situation that we have in which people do not utilize what is already there for them.

Mr. TOMS. That is correct.

Senator COOK. It seems to me we can play games all we want to with this, and maybe we can be critical. I am critical that the tests haven't been made yet. I don't know how many Ford seats are in production, or the others, but certainly it was incumbent on the agency to immediately get off the market all those things that just had two little hooks that went over the back seat, that had absolutely no restraint whatsoever.

Mr. CARTER. And we did it.

Senator COOK. And you did it. Now you are not in the business of designing for the purpose of telling American industry what it has to manufacture.

Now if we want to give you that authority, that is congressional authority. But you still have to be in a position to recommend, once something is manufactured.

I don't know how many of these Ford seats are manufactured, or whether they are readily available on the market. But at least I think

that your department acted wisely in initially getting those items that were of absolutely no value and were death traps, as far as the child in a front seat of an automobile, off the market.

Senator HARTKE. Mr. Furman, did you want to comment?

Mr. FURMAN. First of all, our position is that if a parent wants to go out and buy something for a child, even if it's clumsy or something a child would not like to sit in, that parent has a right to find something on the market that has a Government seal on it saying it meets Government standards. That it is indeed safe.

As far as the Ford Tot Guard is concerned, I have one. My son is 19 months old, has been using it for a year. We have already gotten some letters from people saying: "My son can climb out of the Ford Tot Guard; maybe it's not that safe."

I am saying it is a matter of getting a child into that device at an early enough age that he comes to understand this is his place in the car, and it is a safe place to be. And I insist on my son sitting there, and he is quite resigned to it, and perhaps even happy.

Senator COOK. I can't argue that point with you. I don't think there is any question about that. I think it's the same thing as trying to tell all the children in my family when they get into that automobile to put the seatbelts on, and pounding and pounding away at it until it is done.

Maybe the logic of that reasoning works a little better with a 19-month-old than a 19-year-old.

Senator HARTKE. I might say it's easier to get my children to use seatbelts than my wife.

I think it's mostly the adults in our generation that are perhaps harder to convince.

But let me come to this matter again. What about the Sears seat?

Mr. FURMAN. The Sears is a harness, and the reason it has been excluded from this conversation, sir, I think is that it is not covered by standard 213. It is covered by another standard for seatbelts.

Mr. SCHNEIDER. Standard No. 209.

Mr. FURMAN. The fact is, with the Sears harness, it has in my mind—and I don't know whether I am really speaking from the Consumers Union point of view—there is some difficulty in getting a child into it. It's a little trouble. It takes maybe 5 minutes to strap the kid up. It has straps for the legs, and shoulders and vest, and all this gets strapped to the seat.

It's very, very comfortable to the child—absolute freedom of movement. It meets our criteria for safety, but it's not a seat.

Senator HARTKE. If you had a performance standard, Doug, then the Sears harness would fall within that framework?

Mr. TOMS. It does, under standard 209, and then it will, of course, be under 208.

Senator HARTKE. I don't think Senator Cook and I are in disagreement. The point I am concerned about is in leaving the impression that the seat is safe and, in fact, it isn't in a 30-mile-per-hour crash.

Mr. TOMS. What we are saying is that those seats which meet the static test requirement are in an order of magnitude better than those on the market before.

There are still a lot of low-speed crashes—sudden stops for which these seats are sufficient. We must now take the next step. When the

report is in to us, we can then develop a dynamic test that will require 30-mile-per-hour barrier capability and move as rapidly as possible into the situation where all child-seating devices will meet that requirement.

Mr. SCHNEIDER. The test we saw performed in today's film was extremely severe. I hope the people in the room realize that the test performed in the film we saw represents a crash into a parked car at a speed of 60 miles per hour.

Mr. FURMAN. Thirty miles per hour.

Mr. SCHNEIDER. You said a 30-mile-per-hour barrier test. That's the equivalent of a 60-mile-per-hour crash into a parked car.

Mr. FURMAN. A 30-mile-per-hour barrier test is a 30-mile-per-hour barrier test.

Mr. TOMS. Yes, but a barrier is not equivalent to a car.

Mr. SCHNEIDER. Mr. Chairman, Mr. Furman's remark is totally not so.

Senator COOK. Please explain this to me.

Mr. CARTER. Mr. Chairman, this was a so-called sled test. When we speak in terms of barrier equivalents, it would be the same impact you would get if you drove a car into a solid wall that didn't move more than a thousandth of an inch at the time of impact.

Mr. Schneider's statement is 100 percent correct. The test we have seen is the equivalent of a head-on collision between two cars each of which is traveling at 30 miles per hour, or one car hitting a parked car at 60 miles per hour. The test is that severe.

If I may, I would like to return to the report just a moment. The report did indicate that they had enough data. You quoted verbatim from that report. If I may, I would like to quote verbatim from the report, under the title of "Dummies."

It says:

> No complete answer can yet be given to the question concerning accurate duplication of human limitations by dummies.

Senator HARTKE. What page is that?

Mr. CARTER. I don't have the page reference, sir. It's a direct quote from that, under "Dummies."

Another quote, under "Child Anthropometrics."

> This whole problem demonstrates a substantial lack of data on children and babies. To start with, adequate anthropometric data necessary to construct human simulators is only just now becoming available.

We do have research programs which I could list here, or submit for the record, that address those problems.

Further quoting from the report, under "Child Tolerance."

> Although some data is available from adults, the equivalent for children is not yet available. Further, some medical people are of the opinion that the greater . . . (reading) . . . of the child, leads to greater resistance to impact. Other . . . creates less resistance.

As Mr. Furman pointed out, Mr. Chairman, there is a lot to compliance test procedures. Banking a sled at 30 miles per hour is only a part of it.

You have to have a test device that in some way resembles humans, and you have to know, as Mr. Furman suggested, the G forces, or what we refer to as injury criteria.

All of these factors must be considered in compliance test procedures which we are attempting to develop. We have research programs to help us generate this data.

As I recall the report, some of those statements read to us by the chairman were qualified. Read by themselves, perhaps outside of the context of the total report, they may be misleading.

Senator HARTKE. I only have the summary here, and I have scanned it very quickly.

I find nothing in the summary that says that. Everything in the summary is definite—for example, page 39: "the dynamic response depends on . . ."—"thus recommends that the test procedure be a dynamic one and test documents be segmented in three parts, head, torso, and lower extremities, in order to adequately . . . dynamic environment."

This is referred to throughout the recommendations. I hope that you will take this in a manner in which I mean it—I do not understand why it has taken so long to come up with a dynamic test standard.

I have to admit that I am at a loss to see why you came up with a static test, although I will accept your explanation.

I am just stating my opinion. We are not having a vote. All I am saying is that I am firmly of the opinion that I do not want to leave any false impressions of safety. I do not believe that a static testing procedure is sufficient.

Mr. TOMS. We agree it is not sufficient.

Senator HARTKE. And I think to issue standards with a static test in my opinion is misleading. That's all I am saying.

Senator COOK. Mr. Chairman, first of all, I think we are working on some rather serious presumptions that I am not sure we can work on, to begin with.

We have seen one test at 30 miles an hour. You all totally disagree that it is a 30 mile an hour barrier collision. You say it is 60 miles an hour crash. So we already have a total disagreement.

And what interested me, Doug, is that you said, in fact, that those items that were there will pass tests at 5 and 10 miles. You are talking about crashes in parking lots, at the grocery store, and so on and so forth.

So that there is a safety feature to these items, and obviously there is a point at which even the best of them will break down.

Now whether that is 30 or 40 or 50 miles per hour, you don't know, and these tests don't show. And these tests don't show the differences between the same crash in a Volkswagen and a Cadillac.

So therefore, to take the assumption, all of a sudden, that we need to manufacture a certain type of seat for children would be premature.

I think Cadillac-Volkswagen should have conducted those tests while at 5 miles, at 10 miles, and at 20 miles an hour, and at 30, so that we could get an evaluation.

Obviously the first thing you did was to get everything off the market that you knew was totally useless and was of no value at all from a safety standpoint.

Then you proposed static standards that at least in the majority of crashes, or the majority of accidents, would lend a degree, a serious degree of safety to the child.

Mr. TOMS. That is correct.

Senator COOK. You are now in the process—and I am going to agree with him that I am sorry you haven't finished, and sorry you didn't get underway sooner—but the point is, that you have not lied to the public or misled the public, simply because you have not been able to establish totally effective standards. To do that you would have to adopt a safety provision for each one of these seats and say one is approved up to 5 miles an hour, one is approved up to 10, this one is approved up to 20 and this one is approved up to 30. And somehow or other, I don't think you are going to get into it that extensively.

Mr. TOMS. We shouldn't.

Mr. FURMAN. Yes, very seriously, on the subject of the 30-mile-per-hour thing, I'd like to express very forcefully—we say in Consumer Reports, our basic test is a sled crash from 30 miles an hour, with a bench seat facing forward, closely simulating the deceleration of the passenger compartment of a full-size car—it would be worse than that in a small car—hitting a fixed barrier such as a concrete abutment, as you said, or a large tree, or perhaps a telephone pole, at 30 miles per hour.

And to say 60 miles per hour is a red herring; and it's 30 miles per hour hitting another car of the same weight.

Senator COOK. The only way that can be answered is to have the people who conducted the test.

Mr. FURMAN. I don't think Mr. Toms disagrees with me.

Mr. CARTER. Yes, we do.

Senator HARTKE. Very simply what you are saying is that you have these equivalents. I understand that. This is a discussion without any difference of opinion, and you are talking about terms in the trade.

What we are really trying to find out—and I think Mr. Furman makes the point—is what happens at 30 miles per hour when the vehicle hits that wall, tree, or concrete abutment?

What you are saying is that if you hit a movable object, you are going to get a different impact.

Mr. TOMS. What Mr. Furman is overlooking is that other car has to be coming at you at 30 miles an hour in order for the collision to be equivalent to a 30 mph carrier test.

Mr. FURMAN. I agree.

Mr. TOMS. But——

Mr. FURMAN. That is immovable. That makes it immovable—the same weight.

Senator HARTKE. The same weight and the same speed.

Mr. TOMS. But you don't have the same forces if you hit a parked car at 30 miles an hour as you do if that car is coming at you at 30.

Senator HARTKE. And you are not going to have the same impact with a dog thats elementary.

Mr. TOMS. If the car is parked, you have to hit it at 60 to get the equivalent impact force.

Senator HARTKE. What we are talking about is the fact that most people drive on highways and very few drive at anything less than 30 miles per hour.

Mr. SCHNEIDER. The thing we don't know is whether CU's test was also conducted at 28 miles per hour.

Senator HARTKE. Why don't you know that? Why does Consumers Union come in? Why don't you? They are not even getting paid to do that.

Mr. Toms, did some manufacturers take advantage of a loophole under this standard in order to put their product on the market?

Mr. TOMS. That I personally do not know.

Senator HARTKE. Why not?

Mr. TOMS. Our operations people can answer your question, Mr. Chairman, but I am not personally familiar with the answer.

Senator HARTKE. I have a little baby named after me, a grandson. Just before I came out here, I was with him. His name is Vance. He will be 1 year old on August 3.

Here I am chairing these hearings on automobile safety. What should I tell my son and daughter-in-law that they should have for that child? I can't tell them.

I am a U.S. Senator, and chairman of this hearing. If I can't tell them, and I have the whole Congress of the United States and the whole NHTSA how do you expect Joe Smith and his wife, Mary, to find out?

Senator COOK. They will probably tell you the 12-month-old child was sitting on their lap while driving down here.

I am not trying to throw curves, but really and truly, I am not going to disagree with CU and what you are saying, Vance. But I really have to tell you, now, you have come out with standards and you have upgraded the ability of people to buy a better product for the front seat of their automobiles for children, and you intend to upgrade them more, and you ought to.

Senator HARTKE. Let me ask the question—does General Motors have a device that is safe for 5 miles per hour?

Mr. TOMS. Yes, I believe so.

Senator HARTKE. Ten miles?

Mr. TOMS. We have published the results of these tests static requirements.

Senator HARTKE. I want you to tell me.

Mr. TOMS. We would be happy to give you a printed list. We have circulated it in the form of a press release.

Senator HARTKE. Can you tell me? Is it too much for me to ask you to tell me?

I mean, do I have to read your publications? I will be glad to read them. Are they hard for you to understand?

Mr. TOMS. I understand. All I am saying is I don't memorize each brand name on the list and whether it passes the standards.

Senator HARTKE. I will accept that.

Mr. TOMS. We have tested thousands of devices from tires to child seats, seat belts, all manner of things, and I personally cannot remember each brand and how each performed under a given test.

Senator HARTKE. But I will guarantee you, one of these will say, "this gadget meets standard No. 213 of the National Highway Traffic Safety Administration."

Senator COOK. Do they really say that on them? That is a very interesting point.

Mr. SCHNEIDER. The statute says the manufacturer shall certify that his product complies with the applicable standards.

People in the child seating business are required to put a label on the seat that says, I, as a manufacturer, am certifying that my product meets the Government standards. But the Government does not approve this certification label.

We go out and test. We select on a random basis. When standard No. 213 went into effect, we bought many child seats. We spent considerable money testing child seats, and we determined that some manufacturers were making seats after the date the standard went into effect that failed to meet the standard. Consequently, we forced recalls.

About 55,000 child seats involving six manufacturers were recalled, as I remember, during the first 6 months after the standard went into effect. We publicized these results. Some newspapers carried our release, others didn't.

I don't know what more we can do, unless Congress wants to change our way of doing business to that of the FAA, where the FAA oversees every step of the process. From the initial design stage to the fabrication stage, the FAA must approve every step.

I don't believe you can do this in our field. I believe this would be impossible. You'd have to have a bigger bureaucracy than the entire DOT is right now.

Senator HARTKE. But, Larry, let me ask you, when you buy that gadget on the market today, no matter how that is written, it appears on the harness or the seat itself?

Mr. SCHNEIDER. Yes, sir.

Senator HARTKE. This statement that they have certified that they have met the standards as set forth by the National Highway Traffic Safety Administration.

Mr. SCHNEIDER. The certification just says that the item meets the applicable Federal motor vehicle standards. It does not identify us.

Senator HARTKE. All right.

Mr. SCHNEIDER. Mr. Chairman, I have three children, all small. I cannot get them to use child seats. Two of them are too old to use them now. But I would buy any seat for my kids that we would test that would comply with the existing standards. I do not know what other emphasis I can personally add. I recognize that the standard is weak; but it is better than the previous situation. Still, it is not as good as that which we would like to have.

Senator HARTKE. All right. Which illustrates very definitely the need to speed up the whole process. Are you short of personnel to speed it up? Are you short of money? Are you short of anything that we can give you?

Mr. TOMS. This is one of the aspects we talked about earlier.

Senator HARTKE. We are ready to put in $14 million more than the Budget Bureau would permit you to ask for.

Mr. TOMS. And, of course, as you recall, for which I applauded and thanked you.

Senator HARTKE. Yes, I understand. I do not want to get you in trouble downtown.

Mr. TOMS. I appreciate your sympathy this morning, Mr. Chairman.

Senator COOK. I must say, Doug and I will continue our fight outside of the committee on air bags and seat belts. I think the only thing that we can really say, having seen these films which are very interesting to me, is that we may have found a safe product, but we really do not know whether we have or not, and I would hope that we have not given the opinion that we do have an absolutely effective product. I think that when you pick a specific speed and when you utilize everything within the framework of that one speed, you overlook a tremendous number of variables.

The unit that you may have in your car may totally break down at another 5 miles an hour, and I am again agreeing with the chairman, NHTSA must move expeditiously in this field.

Mr. FURMAN. I did want to say that our position is no child should ride in a car unrestrained and these devices—when we first announced our findings, we were asked whether we would recommend any of these. We do agree that they are valuable when talking about parking lot crashes and in emergency maneuvers where you come to a short stop. The reason we chose 30 miles an hour was the telemetry was known as to what the G forces were involving a full-sized care at that speed, and without the budget you have, we took some known variables, if you will, and applied them to this test. It is a severe test but it is a 30-mile-an-hour crash into a fixed barrier.

Senator HARTKE. Senator Cook has a couple questions.

Senator COOK. I have just two questions and then I am through. What is the position of NHTSA in regard to mandatory seatbelt usage laws? I understand both Australia and New Zealand have adopted such laws with considerable success. That is my first question.

Mr. TOMS. Do you want me to answer that now?

Senator COOK. Yes.

Mr. TOMS. We support them as strongly as we can, and we are proposing under our highway safety program rules and regulations which will require States to adopt legislation to pass mandatory safety belt usage laws.

Mr. SCHNEIDER. This will appear in the *Federal Register* within a week to 10 days, Senator Cook.

Senator COOK. Has there been any progress made in developing a passive restraint system that will be effective in rollovers, side impacts, and secondary collisions?

Mr. TOMS. Yes. One of the things that we have not talked personally about is that there have been really remarkable improvements in passive restraint systems. The difficult problem that faces the manufacturers is selecting the passive system that best suits the dynamic nature of their vehicle without hindering the sale of the vehicle.

Although we have talked a lot about the potential of air bags, we have not, before this committee, had the opportunity to discuss belt/bag combinations which the AllState cars have. We believe very strongly that all of these systems have to be considered by each manufacturer and that it must decide which system works best in its car.

(The following information was subsequently received for the record:)

[From the NHTSA]

DESCRIPTION OF ALL CURRENT AIR BAG TESTING AND DEVELOPING EFFORTS. ADDITIONAL INFORMATION IS INCLUDED IN THE FOLLOWING AREAS

1. Roll-over.
2. Side-impact.
3. Second-collision.

CURRENT AIR BAG DEVELOPMENT AND TESTING EFFORT

Contract	Title	Remarks
HS-024-1-164	"Air Bag Restraints for Subcompact Car Drivers."	Southwest Research is currently engaged in 2 development and evaluating programs, the objectives of which are to determine the capabilities of current air bag restraint systems for protecting the driver and front seat occupant of a subcompact (Pinto) car. Preliminary evaluation has been completed and was performed by sled testing and final evaluation is being performed by full scale car crash tests. Tests have been conducted to speeds up to 35 m.p.h.
HS-053-1-168	"Inflatable Occupant Protection System for Rear Seat Occupants."	Cornell Aeronautical Laboratory is engaged in developing an effective inflatable occupant restraint system for rear seat occupants of motor vehicles. Preliminary development tests have been completed and full scale car crash tests to demonstrate system capability are soon to commence. The system has been tested to speeds up to 50 m.p.h., and successfully meets the injury criteria of FMVSS 208 at speeds well above 30 m.p.h.
HS-053-2-280	"Advanced Inflatable Occupant Restraint Development."	Cornell Aeronautical Laboratory is developing an improved inflatable restraint system to extend the level of crash protection for the front seat passengers of standard-size automobiles. The specific objectives are to continue the development of the multicell concept and to determine and evaluate the performance in a series of sled tests simulating a wide range of impact conditions.
HS-113-2-441	"Advanced Air Bag Restraints for Standard Size Car Drivers."	Minicars, Inc., was recently awarded a contract to develop a driver restraint system which through energy absorption in the steering column and inflatable restraint system, will make more efficient use of the available interior distance within the standard car interior.
HS-017-1-0171A	"Impact Biomechanics and Protection Systems Studies."	Currently tests are being conducted on the Daisy Decelerator Impact Sled with test dummies and human subjects to determine the performance characteristics of a dual inflation air bag. Tests are expected to be conducted to speed up to 30 m.p.h.

1. ROLLOVER

Accident statistics indicate that if occupants can be kept in the car during a crash, their chances of survival are high. Currently, improved windshield retention, improved door locks and vehicle side structures have greatly reduced the possibility of ejection in a rollover. With the retention of some residual air pressure, if inflated, or by controlled deflation time, the air cushion can help keep the occupant in his seat during rollovers. In addition, we will require that manufacturers either meet specific rollover requirements within the standard, or comply with a standard calling for greater roof strength.

Agbabian Associates are investigating techniques for preventing ejection in non-collision rollover accidents.

2. SIDE-IMPACT

The lack of space between the passenger and the side of the car somewhat limits the usefulness of the air cushion in side collisions. Likewise, seat belts are of little or no use in this type of accident. However, accident statistics show that most side impact collisions occur below a crash speed of 20 mph. So adequate protection in this area, as required by the standard, probably will involve other passive techniques such as stronger, and more heavily padded doors and contoured seats, coupled with structural elements designed to prevent compartment intrusion.

Cornell Aeronautical Laboratory and Dynamic Science, Inc., are developing techniques and structure to prevent occupant injury when the vehicle is impacted from the side.

3. MULTIPLE IMPACTS

The situation here is somewhat similar to that of rollover protection, in that the system can offer some degree of protection because of residual air. Present cushions are of a porous material and have proven much more effective for the multiple impacts, since they retain some residual air for a few seconds after the initial impact. On the basis of continuing research being done with gas generators capable of multiple inflation we believe it likely that air cushion systems will be developed to withstand a second, or even third, impact. It should be noted that the percentage of multiple impact collisions is so small that this type of accident cannot be considered a major problem. Also, industry tests indicate current systems provide protection during multiple impacts.

Senator COOK. Thank you, Mr. Chairman.

Senator HARTKE. You have had a lot of pressure in this field. Right?

Mr. TOMS. It is a very controversial field. I regret enormously that there has been so much polarization regarding bags versus belts. This should not be. These systems should work in harmony and complement each other. The important thing is to have a performance standard that permits the research community to develop newer and better techniques.

At the present there are bag systems that do some things very well. There are some belt/bag combinations that do other things better. Some potential passive systems could work extraordinarily well in certain kinds of cars. The media has tended to oversimplify this situation and the result has been polarization.

Senator HARTKE. If seat belt utilization were higher, would it reduce injuries substantially?

Mr. TOMS. Yes, substantially.

Senator HARTKE. What percentage of utilization is there?

Mr. TOMS. Seat belt utilization is 16 to 18 percent and lap and shoulder belts worn together are 3 to 4 percent.

Senator HARTKE. What have you done to promote their usage?

Mr. TOMS. We have a lot of public information commercials on——

Senator COOK. You sure do, and they are good.

Mr. TOMS. We believe the television promotions are extremely good. They are humorous and passionate and talk about the love of family and so on. We have also pushed very hard for promotional campaigns within the States through State and community grants. Also, there is much written material. We do not want to design cars. We do not want to design belt systems. Although we have been forced to specify more narrowly how belt systems can be installed, this is an attempt to make them easier to use.

Senator HARTKE. Have you made any sociological studies that show the impact of these campaigns that you have had?

Mr. TOMS. I would like to have Jack Goldberg comment on that.

Mr. GOLDBERG. I would like to mention a study was made in California. UCLA contracted to develop special targeted messages on seat belts usage. These messages were utilized in three small cities where baseline information was taken both before and after the messages came into these cities. The effectiveness of the messages in terms of modifying human behavior with respect to the wearing of seat belts was exactly zero.

It is becoming more common to hear among sociologists in this country that modification of human behavior with respect to motivating people to wear seat belts by various programs may be vastly overrated and not too effective.

Senator HARTKE. Now, after we have that very disconcerting news, where do we go?

Mr. TOMS. This was the primary reason we went to passive restraint systems. Two or 3 years ago, we reviewed that data. The data at that time were essentially the same as they are now. Motivational programs were not working and seat belt usage was extremely low. It was at that point we decided to move toward passive requirements.

We were convinced at that time that both air bags and passive seat belts could meet our requirements. As we got more heavily involved with dynamic testing, the dummy requirements became difficult for us. Still, the early predictions are now proving to be true. Fortunately, these different systems will meet the requirements and before too long you will see both types in cars.

Mr. SCHNEIDER. It is a two-pronged approach, Mr. Chairman. We are going to try to increase usage by supporting and pursuing mandatory seat belt legislation through our State and community programs.

Mr. TOMS. We must have this for the 110 million cars that are presently on the road with belt systems. It is extremely important that we deal with the people that presently have active belt systems in their cars. But we cannot in good faith, Mr. Chairman, pour millions and millions of dollars into the public service messages when we know from the research findings that we have that this does not modify human behavior.

Senator HARTKE. I hope the Congress will take cognizance of this in many other areas. I am chairman of the Veterans' Affairs Committee and I think these so-called public service "Give a vet a job ads" are—well, if you were a farmer, I would use an old expression, but since you are not, I will not use that.

Mr. TOMS. You may.

Senator HARTKE. Even with the women's lib I am not sure it is proper usage here in the hearing room.

The RECAT report accused the NHTSA of adopting what they termed "undimensional" standards. Citing MVSS208, the report stated that "the regulation does not require that an air bag or other passive restraint system meet any specified reliability standard, nor does it require that the system be free of potentially hazardous side effects such as harmful sound levels or toxicity upon deployment. Thus the regulation is incomplete."

In your opinion, is the regulation incomplete?

Mr. TOMS. No. We debated very thoroughly in the formulative days of that standard whether we should go into those fields. We decided that the performance itself was adequate and that liability considerations would take care of those factors. We do not think that any manufacturer would put in a system that would violate toxicity levels, and we do not belive that any manufacturer would knowingly install a device where there were grave doubts as to its efficacy.

Senator HARTKE. Do you believe in Freudian transmission?

Mr. TOMS. That is right.

Senator HARTKE. Let me ask you, in order to comply with the safety standards for the model year 1972, the manufacturers have installed these warning devices on the safety belts. Have you found any results from them whatsoever?

Mr. TOMS. The results are enormously discouraging. We have run tests on rental car fleets and we are still conducting film tests from viaducts. We are finding that the great majority of people are knotting their belts so that the buzzer does not function.

Senator HARTKE. Do they go to the dealers and ask them to disconnect them?

Mr. TOMS. There are a lot who do that. We are even finding salesmen telling customers how to overcome the system. Apparently, it is just another failure in trying to get people to do something that they just do not want to do.

Senator HARTKE. Do you think there is a suicide complex among people that drive automobiles?

Mr. TOMS. There is something to be said for "out of sight, out of mind." People want to be safe but they are just too lazy to take the necessary steps to secure themselves.

Senator COOK. Suppose everybody decides that since he has this in his car it has the opposite effect and everybody goes down the freeways at 75 and 80 miles an hour.

Mr. TOMS. We have worried about this. We have done some behavioral studies to determine whether this would cause people to be complacent or to take extra risks. Our evaluation of risk-taking motives indicates that your concern may have merit.

Senator COOK. You see, one thing that we debated last year, as you remember, Mr. Chairman, was that we were imposing on the industry certain standards of automobiles coming off the end of the line and then, all of a sudden, the car gets in the driveway and the young guy hauls off the hood and he takes out the rear end and he puts in a new rear end and puts two new tires on the back and all of the sudden, instead of the car having a level so that bumpers meet, it looks like this (indicating), and it is going down the road and you do not know what kind of vision capabilities he has or whether the bumper meets the bumper of another automobile; and what he has done is totally change the characterization of that automobile and all of the tests that you have run on that vehicle and all the standards that have been established by the manufacturer are down the drain.

Mr. SCHNEIDER. That is exactly why we are looking to State laws, Mr. Chairman. In the proposal coming out the same time as the one relating to mandatory seatbelts, we seek to have the States legislate in this area to prevent the alteration of a vehicle. Observance of such laws would be monitored through its inspection program. This will help bring vehicles into compliance with the applicable standards. We have worried about that approach and that is our solution. Whether it is the best solution or not remains to be seen.

Senator COOK. Here is where I have to be very frank with you, and if there are automobile industry people here and manufacturers of facilities for automobiles here, somehow or other you are imposing a standard and yet they are manufacturing an item—they are manufacturing a tire, they are manufacturing springs—that somebody can go in and buy and totally alter the entire basic standard of that automobile, and thus the reaction that vehicle will have in relation to a crash with another vehicle.

Mr. TOMS. Mr. Chairman and Senator Cook, one of the toughest tasks that faces us is what extent shall we allow people to get custom

paint jobs or modify their cars to their personalities. As you know, there is a substantial custom car, hot rod, sports community in the United States. It is extremely difficult to suggest guidelines for State inspection programs so that State authorities can tell what the limits of safety are for these modifications. It is enormously difficult, principally because there are so many variations and so many varieties of automobiles The motorcycle community especially is upset because they want to be able to modify motorcycles. We honestly do not know how much extension or weight you can have on a motorcycle front end before it becomes hazardous. We are attempting to find out.

This is only one of thousands of these kinds of variations that we are looking into.

Senator COOK. Some of these vehicles are so modified, and the rear end is so high and the front end is so low, that you actually need and ejection seat, and yet the modification parts are easily accessible and sold by the industry all over the United States.

So they are saying in one line, "We are going to conform between now and a certain date," and in another line, in their parts manufacturing facilities, they are saying, "We really do not care, and anybody can buy these things, and anybody can modify their automobiles any way they want to modify them."

Mr. TOMS. We have to give due credit to the Special Manufacturers Association and all the other groups that have been in this. They are trying to police their ranks. They think they are taking stringent steps to make sure that individual items are manufactured to meet minimum safety requirements.

Senator COOK. Remember the difficulty we had last year with all the movies trying to establish the standards so that all bumpers were going to be at the same level and then you impose this on everybody when the car comes off the line, and after it comes off the line they change it any way they want it.

Mr. SCHNEIDER. That is another reason for looking to State law for that bumper problem and what will happen afterwards.

Senator HARTKE. Is that the reason—what is that advisory council called?

Mr. TOMS. The National Motor Vehicle Safety Advisory Council.

Senator HARTKE. Is that the reason they gave that award to Mr. Cole?

Mr. TOMS. Would you like for me to talk about that?

Senator HARTKE. I do not know; do you want to talk about it?

Mr. TOMS. Do you want to hear about it?

Senator HARTKE. I just wondered if they had done anything else.

Mr. TOMS. Yes. You are probably reacting to the picketing at the St. Francis' Hotel and to some of the press coverage on it.

Senator HARTKE. I just asked a very simple question; I did not react at all.

Mr. TOMS. The council is more active now than it has ever been. I compliment all the members of the Council for taking on a greater interest in safety and in the affairs of government than the Council has ever taken on before. I realize that the Council's award was controversial. But, I cannot speak for the Council because we had nothing to do with the granting of that award. That was something they did unilaterally.

Senator HARTKE. I did not know we authorized them to give awards.

Mr. TOMS. That question is under review at the present time. The Council did not use any Government funds. In fact, they did not use any resources of the Government. The decision was entirely their own. Chairman Branch is as much an ardent advocate for safety as any man I have ever met. He was, among other thing, the first to buy special test vehicles. He has placed ads concerning bumpers in all the magazines and on television. With his direction, Allstate launched massive campaigns dealing with all forms of safety. They have been a leader in the field for a long time.

I believe that Chairman Branch, in supporting this award for Mr. Cole, felt that of the many people in the industry who have been reluctant to move for safety, Mr. Cole has been exceptionally positive and constructive in trying to get new safety devices in vehicles. Although I cannot speak for Mr. Branch or the Council members, I do know that he is a person who would not support this award if he did not believe that it was warranted.

(The following information was subsequently received for the record:)

Section 104 of the National Traffic and Motor Vehicle Safety Act directed the Secretary to establish the Advisory Council, stating that "the Secretary shall consult with the Advisory Council on motor vehicle safety standards under this Act." It does not appear that this briefly stated function was intended to delineate precisely the outer limits of the Council's functions. For example, Congressman Rogers in discussing the functions of the Council in the House debate on the bill stated that, "The inclusion of the Council will guarantee a free flow of information between Federal authorities, State, and local bodies concerned with the bulk of the safety effort . . ." 112 Cong. Rec. 18780–1 89th Cong. 2nd Sess. (Aug. 17, 1966).

Given the absence of any express limitations on the Council's functions, it seems reasonable to assume that the Council's activities include the furnishing of information and expression of opinions generally on a wide variety of matters related to the Secretary's responsibilities under the Act. The Council has in fact been doing this since its inception as indicated by the testimony on the Council's first Chairman at a Congressional hearing in 1967. (Hearings on the Implementation of the National Traffic and Motor Vehicle Safety Act of 1966 Before the Committee on Commerce, United States Senate, 90th Cong., 1st Sess. March 20–21, 1967, pp. 150–154.)

Recently, the Council determined on its own that an award should be given to that individual who during the past year had displayed the greatest contribution to the field of automobile safety. It should be noted that the award did not involve the expenditure of any Governmental funds.

Thus, the granting of this award was in essence an expression of an opinion by the Council on a subject related to motor vehicle safety.

Senator HARTKE. I really do not care if Mr. Cole got the award or not. If Nixon gets the Nobel Peace Prize it is all right with me. Senator Scott has recommended that. That is all right with me.

What does disturb me is just exactly what have they done? Could you submit for the benefit of the committee what the Council has done over the past 4 years, and give us a report of how much money they have expended and ——

Mr. TOMS. Absolutely. Mr. Chairman, I will say a few words to allay some of your concerns.

Senator HARTKE. Just a minute. Let me just give you what I would like to have and then you can allay my concern. How many staff members have been assigned to them?

Mr. TOMS. Surely. We will be pleased to: Quite frequently we must make difficult decisions in our work as to how we spend our money, how we identify our priorities, and how we move ahead in certain programs. I consult the Council quite often as a sounding board. The Council represents the public and has provided us with much constructive advice.

(The following information was subsequently received for the record:)

NATIONAL MOTOR VEHICLE SAFETY ADVISORY COUNCIL

The legislative history of the National Traffic and Motor Vehicle Safety Act of 1966 indicates that Congress wanted an advisory group, free from the responsibility of administering the Safety program, which could bring forth the wide range of outside points of view and technical possibilities affecting motor vehicle safety. To this end, the National Motor Vehicle and Traffic Safety Act f 1966 provides for the establishment of the National Motor Vehicle Safety Advisory Council, a majority of whose members represent the general public with representatives of the motor vehicle and related equipment industry composing the remainder. The Act directs the Secretary of Transportation to consult with the Council on motor vehicle standards promulgated under the Act. A short history of the Council since its establishment in 1967 is summarized below.

1967

On January 6, 1967, President Johnson announced the formation of a 17-member council. The members were appointed in accordance with criteria of the National Traffic and Motor Vehicle Safety Act, which specifies that a majority of the membership shall be representatives of the general public and the remainder shall include representatives of the motor vehicle and equipment manufacturers and dealers. Dr. Thomas F. Malone, Vice President and Director of Research of the Travelers Insurance Companies, was named Chairman of the Council.

Vice President Humphrey administered the oath of office to the members during the first Council meeting on January 19, 1967. The remainder of the meeting was devoted to briefing and discussion of the Department's initial motor vehicle safety performance standards, then in proposed form. After further consultation with the members on the initial standards at a second meeting on January 31, the standards were issued in final form by the Federal Highway Administrator.

Successive Council meetings concentrated on indepth orientation and familiarization of members with basic issues of vehicle safety and with industry and technical community practices. This was accomplished through the meetings held at vehicle and tire manufacturing and testing facilities in Detroit and Akron and at the Intitute of Traffic and Transportation Engineering of the University of California.

The Council established committees to focus attention on key issues. These committees have been concerned with such subjects as new and retread tire standards, small-volume vehicle manufacturing, certification, international affairs, consumer information, research and legislation.

1968

The Council was expanded to 22 in 1968, from its original membership of 17, in order to give it greater opportunity to deal with a growing list of topics such as used vehicle standards, school bus safety, consumer protection, and long-range goals. The Council met 7 times in 1968.

The major involvement of the Council in 1968 was with the proposed consumer information regulations. The concept of such regulations was first endorsed by the Council in 1967. After receipt of comments to an Advance Notice of Proposed Rule Making from industry and the public, the Council met in November 1968 to discuss the major relevant issues and recommended that the Department move expeditiously to publish detailed and specific proposals for consumer information so that they would be implemented on a feasible basis. This was subsequently accomplished.

The Motor Vehicle Safety Act specifies that the Department is to consult with the Council on uniform Federal standards of used motor vehicles after the Department submits a report to the Congress on safety for vehicles in use. This re-

port was submitted to Congress in June of 1968, following which the Council and its Used Vehicle Safety Committee met several times for extensive discussion of the issues in this report. Participating in some of the discussions were representatives of the American Association of Motor Administrators, and the National Automobile Dealers Association, and the Vehicle Equipment Safety Commission.

As a result of these discussions, the Council recommended as first steps in implementing the report that: (1) all States move as fast as possible to establish motor vehicle inspection systems, and (2) the Department begin the process of setting uniform used vehicle safety standards by soliciting comments from all States and other interested parties in the public and industry. In response, The Federal Highway Administrator in November 1968 issued a request for comments along the above lines.

In 1968 the Council also recommended:

school bus safety performance standards with emphasis on steering, braking, driver vision and crash injury protection

90 day comment time for proposed rule making

public meetings on candidates for standards prior to publication of advance Notices.

internationalization of vehicle standards

establishment of a goal by government and private sector alike that the number of highway crash fatalities per 100 million vehicle miles be reduced by one-half by 1980, with corresponding reduction in injury and property damage.

1969

During 1969, the National Motor Vehicle Safety Advisory Council was primarily concerned with the administration, goals and priorities of the Department's motor vehicle safety program. In May of 1969 Council Chairman Malone emphasized the need for highway safety program "accessibility to Cabinet-level rank of officialdom in keeping with the importance of the problem." This recommendation was subsequently acted upon by Secretary Volpe in December 1969 when he announced his intention to realign the Department's highway safety programs to give the attention and emphasis it demands and deserves. The Council also realized that, in addition to realignment of program administration, future progress in motor vehicle safety depends upon the establishment of firm program goals and priorities. Accordingly, the Council, in concert with its sister advisory group, the National Highway Safety Advisory Committee, asked Governors and leaders of industry and the private sector to comment on a proposed goal of halving by 1980 the fatality rate per 100 million vehicle miles. Based on generally favorable replies and a Bureau analysis stating that a 25 percent reduction by 1980 in the fatality rate would be more realistic assuming continued limited resources, the Council recommended to the Secretary that a revised goal of a one-third reduction by 1960 in the current fatality rate would appear attainable of given sufficient emphasis and if adequate program priorities were established by the Department.

On the question of program priorities, the Council further recommended to the Secretary, after a thorough review, that although current data is inadequate to make a firm decision, interim program priorities should be immediately established for apparently high payoff programs in:

Crash Survivability—increasing a crash victim's chance of survival through increased seat belt usage, passive restraint devices, energy-absorbing vehicle frames and improved emergency medical services

Alcohol and Driving—effective countermeasures aimed at problem drinker drivers, a small minority of the driving population which accounts for over 50 percent of the traffic fatalities

Public support—to gain both public understanding of and national commitment to highway safety to assure the required resources

During 1969, the National Motor Vehicle Safety Advisory Council also made the following significant recommendations:

Additional resources and liberalized policies for research in highway safety.

Formalize and improve Council role in motor vehicle standards development.

Urged DOT to make accelerated effort for early implementation.

Outlined steps to make information useful to prospective car buyers.

Advised increased staffing and resources for compliance testing and outlined improved procedure for detection of noncompliance.

Recommended policies for handling cases of noncompliance and release of noncompliance information.

Strongly recommended additional resources be devoted to development of used vehicle safety standards required by the National Traffic and Motor Vehicle Safety Act of 1966.

Suggested joint DOT/HEW task force on auto technician training to review educational/vocational guidelines.

Suggested Council meeting with auto manufacturers to discuss vehicle safety issues.

That tires modified by tire inlaying process be so labeled.

Requested aid from the National Conference on Weights and Measures in insuring accuracy of service station compressed air dispensers.

Most of the Council's recommendations are being implemented by the Department. In addition, the National Highway Safety Bureau issued in 1969 a long range plan for school bus safety in substantial accord with an earlier Council recommendation made in 1968.

1970

The Council held six major meetings in 1970. Some of the major accomplishments during the year have been to:

Urge Federal, State, and local governments, and the auto industry to make air-bag-equipped vehicles available for immediate fleet testing.

Advise retention of lap belts until passive restraints are proven effective.

Recommend new legislative authority for selective exemption of some vehicles from specific safety standards so that most vehicles can meet higher standards.

Establish a clear, firm policy for preemption of State motor vehicle regulations by Federal safety standards.

Advocate more basic research into highway safety.

Suggest vigorous consumer warning bulletins on hazardous vehicles or equipment.

Endorse a successively strengthened safety standard for vehicle interior flammability.

Establish immediately an initial Uniform Tire Quality Grading System based on a tire's resistance to high-speed fatigue and impact.

Develop and present a series of regional conferences, entitled "Partnership in Safety," to strengthen the involvement of State and local officials, administrators, and legislators in the motor vehicle safety program.

The Council in 1970 was restructured into an Executive Committee and four action committees which parallel the reorganization of the NHTSA. This enables cognizant action committees concerned with research, crash survivability, driving systems and consumer and governmental affairs to relate directly to the similarly organized functions of NHTSA.

1971

During 1971, the Council held seven major meetings and sponsored two regional symposia. The two symposia, entitled "Partnership in Safety," established a dialogue with State and local officials, researchers and consumer groups on motor vehicle safety standards and their roles in the Federal motor vehicle safety program. The southeastern symposium was held in Key Biscayne, Florida, in January and a western symposium was held in San Francisco in July.

Some of the more important actions by the Council during 1971 have been:

Provided detailed comments on the proposed property-loss-reduction and diagnostics legislation proposed by Congress.

Recommended maintenance of long-range research in balance with applied research in support of priority programs.

Reemphasized the need for exemption authority to allow higher standards for the majority of vehicles rather than be limited to lower standards which all manufacturers could meet.

Recommended development of practical approaches to the problem of safety standard rulemaking and inadequate production leadtimes.

Urged dissemination of highway safety research results among researchers, manufacturers and administrators.

Sought Federal preemption of diverse State and local laws regulating the

transport of hazardous materials which would complicate the use of the air bag.

Asked for increased funding for research into the relationships between vehicle defects and crashes to provide a scientific basis for the development of standards for used vehicles.

Urged Government and industry to develop standardized and interchangeable diagnostic equipment for motor vehicles.

Reviewed advance drafts of the Program Plan Book, which outlined planned motor vehicle safety standards for the next few years, and provided recommendations on many of the proposed standards.

Sponsored meeting with representatives of imported car manufacturers to discuss mutual concerns in the safety standard setting process.

The Council lost its respected Chairman, the late New York State Senator Edward Speno, in February 1971, but was ably guided by William Raftery, Council Vice Chairman. In June the Secretary of Transportation appointed Mr. Judson Branch, Chairman of the Board of Allstate Insurance Company, to chair the 22-member Council for a three-year term.

1972

The Council continued to play its primary advisory role to the Department of Transportation on the motor vehicle safety program, while expanding its communications role with industry, States and the general public in its effort to involve more people and organizations in motor vehicle safety.

During 1972 the Council reviewed the motor vehicle safety standards and programs which resulted in the following resolutions:

Called for improved devices for testing standards' compliance;

Urged increased research into human tolerance and test dummy development;

Made a series of recommendations concerning motorcycle safety;

Suggested that NHTSA proceed cautiously with plans for a polarized lighting demonstration;

Recommended increased funding for the development of devices to prevent drunks from driving;

Suggested the enactment by States of mandatory seat belt usage laws; and

Repeatedly and strongly recommended massive fleet testing of air-bag-equipped vehicles to bolster public confidence in this life-saving device.

In addition, the Council held its first "International Congress on Automotive Safety—Theme: Standardization of Automotive Diagnostic Systems" in July as part of the Council's efforts to be involved in the cutting edges of highway safety inputs.

The National Motor Vehicle Safety Advisory Council is provided direct support by the Advisory Groups Staff of the NHTSA Executive Secretariat. At the present time, the support staff consists of four professionals and one part-time clerical position and one summer aid. In addition to providing support to the Council, the staff supports two other NHTSA advisory committees, the 35-member National Highway Safety Advisory Committee, established by the Highway Safety Act of 1966, and the 15-member YOUTHS Highway Safety Advisory Committee. The Council and our other advisory committees occasionally rely on additional NHTSA personnel for special conferences, meetings and safety demonstrations.

Senator HARTKE. What is the criteria for membership on the Council?

Mr. SCHNEIDER. The criteria are given in the National Traffic and Motor Safety Act, Mr. Chairman. Section 104 of the statute requires that the majority of the Council shall be representatives of the general public and that the remainder of the Council shall include representatives of motor vehicle manufacturers, vehicle dealers, and equipment manufacturers.

This has been implemented, as I understand it, so that at the present time there are 12 public members and 10 industry members. The statute requires that the Secretary of Transportation shall appoint these members which he does. They have varying terms on a staggered basis.

Senator HARTKE. Who are the public members?

Mr. SCHNEIDER. We have already provided this list to Senator Magnuson by way of a letter. I do not recall all the names on that list at the moment.

Senator HARTKE. Do we have that letter?

Mr. SCHNEIDER. Yes.

(The following information was subsequently received for the record:)

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL MOTOR VEHICLE SAFETY ADVISORY COUNCIL

Term Expires December 31, 1972

Dr. Allen V. Astin* (public), director emeritus, National Bureau of Standards, 5008 Battery Lane, Bethesda, Md.

Mr. Earl Hathaway (industry), director, Firestone Tire & Rubber Co., 482 St. Andrews Drive, Akron, Ohio.

Dr. Henry Hill (public), president, Riverside Research Laboratory, 300 Neck Road, Haverhill, Mass.

Mr. William A. Raftery (industry), executive vice president and general manager, Motor & Equipment Manufacturers Association, MEMA Headquarters, 222 Cedar Lane, Teaneck, N.J.

Mr. Walker Sandbach* (public), executive director, Consumers Union, Mount Vernon, N.Y.

Dr. John D. States (public), associate clinical professor, University of Rochester, 15 Prince Street, Rochester, N.Y.

Mr. Ivan J. Wagar (public), editor, Cycle World, 1499 Monrovia Avenue, Newport Beach, Calif.

Public—12 members.

Industry—8 members.

Term Expires December 31, 1973

Mr. Leslie N. Bland (industry), Leslie N. Bland & Co., 2235 S. Michigan Avenue, Chicago, Ill.

Mr. Judson B. Branch (public), chairman, executive committee, Allstate Insurance Co., Allstate Plaza, Northbrook, Ill.

Mrs. Katherine Burgum (public), dean, College of Home Economics, North Dakota State University, Fargo, N. Dak.

Col. James J. Hegarty (public), director, Department of Public Safety, Phoenix, Ariz.

Mr. Dale C. Hogue (industry), director, Automotive Standards Research Department, Automotive Parts and Accessories Association, 1730 K Street, NW., Washington, D.C.

Dr. Donald F. Huelke (public), University of Michigan Medical School, Medical Science II Building, Ann Arbor, Mich.

Mr. Trevor O. Jones (industry), director, Advanced Product Engineering, General Motors Corp., Warren, Mich.

Mr. Lawrence M. Patrick (public), professor, Bio-Mechanics Research Center, Wayne State University, Detroit, Mich.

Dr. George S. Sutherland (industry), president, Rocket Research Corp., York Center, Redmond, Wash.

Term Expires December 31, 1974

Mr. Ralph T. Millet (industry), Technical Advisor, SAAB-SCANIA of America, Inc., and president, AIA, P.O. Box 679, Orange, Conn.

Mr. John N. Noettl (public), Director, Membership Services, Automobile Club of Missouri, 3917 Lindell Boulevard, St. Louis, Mo.

Mr. William B. Robertson (public), Special Assistant to the Governor on Minority Groups and Consumer Affairs, State Capitol, Richmond, Va.

Mr. Herbert D. Smith (industry), Vice President—Public Affairs Uniroyal, Inc., 1230 Avenue of the Americas, New York, N.Y.

Miss Marcy Taylor (public), Investment Analysis and Research, No. 9005, Bank of America, P.O. Box 37123, San Francisco, Calif.

Mr. Vincent L. Tofany (public), Commissioner, New York Department of Motor Vehicles, Swan Street Building, South Mall, Albany, N.Y.

* Resigned membership on Advisory Council as of July 1972.

Senator HARTKE. All right. Let me ask you this. On July 6, NHTSA announced in the Federal Register that it was raising the threshold weight at which activation of the warning system occurs from the current standard of a 50th percentile 6-year-old-child to that to a 5th percentile adult female.

Will that not result in children being less protected by the warning system?

Mr. TOMS. Yes, it will, and this is one of the reasons we did not do this at first. Our problem is simply to find a middle ground where we encourage the use of these sytems and keep disarmament at the lowest possible rate.

Our early tests showed, Mr. Chairman, that at the 50th-percentile level, a heavy person seated in the outboard position could draw the seat cloth tight enough so that the middle sensor would set off the buzzer. The problem of course is that the buzzer could activate with no one in that seat. A lot of people put grocery bags, parcels, or brief cases on that seating position, and we decided that the old requirement was too sensitive. In almost every car I have used which had this device, I could place my hand on the seat and with very light pressure I could make it go off.

The difficulty of increasing the firmness of seats was such that we decided to change requirements so that it would not be as sensitive.

Senator HARTKE. In that same July 6 Federal Register announcement NHTSA denied an indefinite extension of the interlock requirements beyond August 16, 1975. Are there any situations under which the interlock system would be approved beyond the August 15, 1975, date?

Mr. TOMS. I have said many times that the 85th percentile has been a good guideline for traffic safety activities. I would not consider the extension of seatbelt interlocks beyond August 15, 1975, unless 85 percent of the people were using these belt systems. I have challenged the industry and the research community to assist us in determining what the use levels will be when these vehicles are on the road.

Senator COOK. Mr. Chairman, I must say, you gave me an opportunity to put in a barb and I am not going to let it go by the board, when you were asking how many staff the council had. I have been on this committee now for 3 years. There are 10 Democrats and eight Republicans, and yet there are 58 members of the majority staff and there are nine members of the minority staff. So I hope the Advisory Council is in a little bit better shape than the minority side of the committee.

Senator HARTKE. That is a percentage in which we would like to keep it.

Senator COOK. It might change one of these days. When and if it changes, it will really change.

Senator HARTKE. I am faced with a problem here. I have quite a few questions left and I do not know whether I am going to be able to hold the hearings next week or not. I think we will recess and ask you to come back rather than to move through them rapidly, because I do not feel I can do justice to them if we rush. I have additional questions on passive restraints plus inquiries on mandatory recall, the question of schoolbus safety, the question of enforcement activities, the question of vehicles in use, the Nader report card, the ESV, the small car

integrity, tire grading quality, and some questions on the legislation which you requested. I am going to ask you one last question.

What is the status of the Corvair stability study which NHTSA was to have published last month?

Mr. TOMS. It will be out tomorrow. I received my copy yesterday.[1]

Senator HARTKE. I never cease to marvel at the effectiveness of calling a hearing and how soon it can bring out a report which is overdue.

Mr. TOMS. Your observation is astute Mr. Chairman, but we are not guilty on this one.

Senator COOK. Would you send my office a copy?

Mr. TOMS. We would be delighted.

Senator HARTKE. I do not know, as I said before, what the status is going to be on these hearings. We may possibly arrange for hearings at a rather unusual hour or at a different place.

Mr. TOMS. I will do my best to stand by and be available.

Senator HARTKE. We may have the hearings over in the Capitol to accommodate that.

These hearings are recessed.

(Whereupon, at 11:55 a.m., the hearing was adjourned, to reconvene at 10 a.m. on Thursday, July 20, 1972.)

---

[1] See p. 191.

AUTO SAFETY OVERSIGHT

THURSDAY, JULY 20, 1972

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C.

The committee met at 10 a.m., in room 5110, New Senate Office Building, Hon. Vance Hartke presiding.

Present: Senators Hartke and Cook.

OPENING STATEMENT BY SENATOR HARTKE

Senator HARTKE. Good morning, the hearings on the automobile safety legislation oversight hearings will continue this morning.

I had mentioned at yesterday's hearing that due to Senator Mansfield's announcement regarding a moratorium on hearings for the balance of this session, that it might be necessary to alter the committee's hearing schedule on auto safety. After consultation with the chairman and other members of the committee, we have decided that it is necessary to cancel committee consideration of all amendments to the act with the exception of section 9 of S. 3474 relating to small manufacturer exemptions from safety standard requirements. This one proposal will be considered only because the Secretary's authority to grant such exemptions has already expired.

The committee has, however, requested permission to continue its work on the matter of oversight. The committee believes that since so many important issues and decisions are facing NHTSA, that we have an obligation to the American people to review these matters with administration officials. We began this function yesterday with Administrator Toms and we plan to continue our inquiry one day next week. One or two additional witnesses may appear next week in conjunction with our oversight function.

We are quite fortunate this morning however to have with us two distinguished Members of Congress who will appear and address themselves to the matter of schoolbus safety. Both Senator Jacob Javits and Congressman Les Aspin are sponsors of separate proposals which would beef up the NHTSA activities in the area of schoolbus safety. In addition to Senator Javits and Congressman Aspin, Mr. Charles Pulley, president, American Seat Belt Council will speak on an issue to which much time was devoted yesterday—standard 208 and passive restraints. Our two final witnesses of the day, Mr. David Busby of the Automobile Importers of America and Mr. David Markin, president, Checker Motors Corp. will address themselves to the small manufacturer exemption amendment.

STATEMENT OF HON. JACOB K. JAVITS, U.S. SENATOR FROM NEW YORK

Senator JAVITS. Well, thank you very much, Mr. Chairman, for your courtesy and, as always, full cooperation.

Mr. Chairman, I am here this morning to testify in behalf of my bill, S. 3433, the School Bus Safety Act of 1972.

This measure amends the Interstate Commerce Act to strengthen the enforcement powers of the Bureau of Motor Carrier Safety by enabling the Bureau to exercise regulatory jurisdiction over certain schoolbus operations which are now exempt because they are conducted by private carriers or conducted by agencies and instrumentalities of government, such as local educational agencies.

While the bill is directed at so-called interstate operations, the Dot has indicated that in cases where some buses in a school system are utilized for interstate transportation—such as study trips or trips to athletic events or historical sites—then all the schoolbuses of the school district would come under the reach of the law.

This legislation is the product of study I first undertook some time ago with local and State school officials, professionals in the field of safety and pupil transportation, and officials and professional staff of the DOT.

It is also the product of some recent tragic bus accidents. The subject has been of interest to me for some time since my own daughter, Carla, was injured some years ago in an avoidable schoolbus accident. Fortunately, the injury was a minor one, but it did make personal to me the danger that can beset children riding in schoolbuses.

The bill follows recommendations made by the National Transportation Safety Board in its report on the 1970 fatal bus crash involving a tour group from the Hillel Country Day School at Lawrence, Long Island, N.Y.

The text of the report's recommendation No. 3 is as follows:

> The Department of Transportation, in full recognition of the existing limitations on the scope of services renderable by the Bureau of Motor Carrier Safety, FHWA, because of manpower limitations, seek authorization and appropriations from the Congress to expand the strength and operations of said Bureau to enable it to provide the level of supervisory and inspectional service over interstate chartered buses and charter bus operations necessary to assure a level of safety commensurate with the public's right to safe travel in chartered vehicles.

The Department of Transportation was kind enough to extend to me the assistance of its technical staff in the drafting of the bill in accord with this recommendation.

For 1970, the most recent data available indicate that there were 42,000 schoolbus accidents, killing 140 persons and injuring 5,400. This involves 2.2 billion miles of travel during that year.

While this record for safety is considered superior to the safety record in other areas, testimony that I understand will be presented to this committee by the Physicians for Automotive Safety will indicate that the number of injuries is actually much higher than indicated by these statistics.

The fact remains that the safety and well-being of our children merit every safeguard that can be undertaken.

The tragic schoolbus accident last spring in Congers, N.Y., in which four students were killed and more than 40 injured has dramatized the increasing public concern for the safety of the almost 20 million

young people who each day travel in some 285,000 buses to and from school.

PROVISIONS OF BILL

Specifically, the bill would:

Authorize the Secretary of Transportation to establish reasonable requirements to promote safety of operation of schoolbuses including qualifications of drivers, maximum hours of service and standards of equipment.

In administering and enforcing regulations to promote schoolbus safety, the Secretary would be authorized to use the administrative powers that he now exercises in the administration of the DOT's motor safety program, such as record inspection, issuance of administrative subpenas, and inspection of motor vehicles.

GIVE THE SECRETARY ENFORCEMENT POWERS

Give the Secretary power to issue a cease and desist order directing the carrier to stop immediately schoolbus operations for up to 60 days in a case where a motor carrier's schoolbus operations create an unreasonable risk of accident, injury, death, or property damage, and when the Secretary finds that application of other available sanctions would be impracticable, unduly time consuming or inadequate to protect the public health and safety.

CONCLUSION

The bitter lessons learned from the tragic deaths and injuries in the accidents involving the children from Congers, in Rockland County, N.Y., last spring, and the children from the Lawrence, Long Island, Hillel Country Day School 2 years ago, to which I referred must be used to avert such tragedies in the future.

I urge favorable consideration of this legislation.

Senator HARTKE. Thank you, Senator Javits.

Senator, I know of your deep concern, and I appreciate your added emphasis in view of your own personal experience with your own family.

I want to point out something and I hope that you would use your influence to convince the DOT, or any other department of Government, that you cannot have an effective safety program by merely passing laws. There must also be effective administration of those laws.

I have the highest regard for Doug Toms, and he knows this. I have not necessarily always been the easiest person on him in these hearings. I want you to know that, too.

One of the reasons for that is that when I see any one man in the whole NHTSA assigned to schoolbus safety for all of the children in the United States of America, it becomes apparent to me that the NHTSA effort in the area of schoolbus safety isn't even tokenism.

We earmarked $1 million, which they didn't even request, to develop a crashworthy schoolbus.

It is this type of lack of dedication to safety which frustrates me endlessly. This year, 57,000 people will be killed in auto accident in the United States and frankly, nobody really seems to give a damn.

I am disturbed by this complete lack of concern, and this failure to really approach the issue in an effective manner.

Let me ask you several questions.

The NHTSA has proposed a new program standard relating to schoolbuses identification, equipment, maintenance, and inspection. It also requires route selection and driver selection training.

In your opinion, do these program standards satisfy the requirements of your bill?

Senator JAVITS. They do not. They are part of my bill, but then by no means a totality.

One of the things that worries me is the whole matter of followup in terms of inspection—what happens in these situations.

You can lay down the best guidelines in the world, but the school runs into a jam and they have to hire some other driver, or they can't send the bus in for servicing, and the next thing you know, you have one of these terrible accidents.

So in this particular case, I feel personally that it is almost like the commercial aircraft business, that there have to be basic specifications which will insure such continuity in the safety supervision as to give the kids the best break.

I don't think there is much question about that, Mr. Chairman, that all of us would feel that in respect of the child's responsibility for the bus, unlike the driver's responsibility for his car, that this is, quote, involuntary busing. In other words, I mean, what does the youngster know about it? He doesn't service it. He doesn't take care of it. Poppa and mama arrange it, or the municipality or the school district arrange it, and that is it, he is in it.

Senator HARTKE. Did you find any cases where the local school jurisdiction were employing drivers who were either mentally or physically unqualified to drive schoolbuses?

Senator JAVITS. We know of other studies which have shown it. Our own study did not, but again, we must appreciate the difficulties of getting help these days. A school district is very reluctant to not run the bus that day because the driver didn't show up, and that is where you run into your troubles.

Senator HARTKE. Senator Cook, do you have any questions?

Senator COOK. Senator Javits, I know that you called for a 60-day cease and desist on an entire system.

Are we going to come up with an alternative? For instance, if you take a rural school system in a central school, let's say it is operating 40 or 50 buses. Each one makes 2 or 3 runs a day, this is going to knock the daylights out of attendance.

Now, have you come up with any proposal for financial assistance? Because it seems to me that if we give the authority for a 60-day cease and desist, to get a whole fleet of buses, it is going to put a central school system into chaos.

I understand that the chaos certainly isn't worth any lives. What I mean to say, let them live with the chaos rather than lose a life.

But I am also worried about attendance requirements, legal requirements. Have we come up with some kind of an alternative in your proposal to handle this situation?

Senator JAVITS. My proposal here in this bill does not come up with a safety valve for that kind of a situation and simply assumes that the public health and safety must be paramount.

Senator Cook. But we should discuss it in committee?

Senator Javits. I am going to make another suggestion, if I may, Senator Cook.

We do have provision which would allow funds to be used for these purposes in the educational field. I will make it my business—and you know I am ranking minority member of the committee, and I hope I can be effective—to coordinate whatever you gentlemen decide with your expertise.

So whatever you gentlemen decide is the optimum thing to do or the right thing to do in schoolbus safety, I would play it for myself, and I am sure that Senator Pell, who is chairman of our Education Subcommittee, will feel exactly as I do in this matter, to coordinate our school aid with exigencies which may occur in the event of a cutoff of service because of the public health and safety, so that they can simply charter buses and have a ready emergency source with which to do it.

And we would talk with the education authorities, and we will pipe into you as part of my remarks a communication from them which will give their ideas as to how that problem can be handled.

Senator Cook. Well, now, let's explore this just a little bit. With all deference to the chairman, the DOT has been in existence since 1966, and he is disturbed since all the problems in transportation haven't been solved in the last 3 years.

It gets a little bit old after a while to be very frank with you. But you have another problem, Senator.

And that is, that as you well know, I don't think there is a school district in the United States that right now is financially as sound as it would like to be.

You have another situation to take into consideration, and that is evaluation of contracts, because a great many of these are on a contract basis. These buses do not belong to the particular school district. They do not belong to the communities.

They are under contract. This is the only feasible way that a school system can conceivably get a system of transportation.

They are under contract. This is the only feasible way that a school system can conceivably get a system of transportation.

And secondly, it is easy to talk about chartering some buses if you are in New York City, but it is not very easy to talk about chartering a fleet of buses if you are in Jamestown, N.Y., or if you are in Shelbyville, Ky., or if you are where my assistant comes from, who now holds down my office in Louisville, Gravel Switch, Ind., or Splinter Ridge, and you can't possibly charter those buses, Jack.

I think that we ought to take some time, but move with as much dispatch as possible. We ought to understand that not only are they bound by the school system. For instance, in the State of Kentucky, for private schools, local government pays the transportation costs, because the court of appeals ruled several years ago that it was the public safety of the child that called for the cost of the transportation, and not the delivery of the child to an educational institution.

So, therefore, it became the cost of local government.

So you are imposing this obviously necessary obligation at all levels, to a contract carrier, to a school district, to local governments, and I think we ought to take a good look at it.

85-820—73——4

Senator JAVITS. I agree with you that we should, and I would also agree that the instructions to the DOT ought to be of a uniquely specialized character so that there is no broadsword enforcement but that it is enforcement with a scalpel.

For example, if a school system has 250 buses, you don't simply cease and desist 250. You might cease and desist 32.

There I think your caveat is a very sound one, and we should make that very clear again.

I would like the privilege of joining you.

Now, may I explain to the committee, and I am in a terrible jam as to time: we vote at 11 o'clock on minimum wage, and I am the co-maker of the bill.

Senator COOK. May I have 10 seconds?

One other thing: Did your staff make an analysis of State legislation that is presently on the books relative to safety inspection for schoolbuses?

Senator JAVITS. We will ask that that is done and incorporated.[1]

Senator COOK. Thank you.

Senator HARTKE. Thank you, Senator Javits.

Our next witness this morning is Hon. Les Aspin, U.S. House of Representatives.

Good morning, Les.

Mr. ASPIN. Good morning.

Senator HARTKE. We are pleased to have you with us again.

STATEMENT OF HON. LES ASPIN, U.S. REPRESENTATIVE FROM THE FIRST DISTRICT OF WISCONSIN

Mr. ASPIN. Thank you very much.

Senator HARTKE. Might I say that Congressman Aspin is one of the most active Members of Congress, by the way.

Mr. ASPIN. Mr. Chairman, thank you very much for the opportunity to appear before the committee this morning on the issue of schoolbus safety and the legislation which Senator Nelson and I have introduced into Congress.

When asked about schoolbus safety, probably the first thing that the DOT will point out is that schoolbuses are one of the safest forms of transportation. That is true. There are only .05 fatalities per 100 million passenger miles of schoolbus travel compared to 2.1 deaths for auto travel. The reasons for this low fatality rate, however, are fairly simple: Schoolbuses generally move at slow speeds, other drivers usually become cautious when they see a schoolbus, and schoolbus drivers are usually good, cautious drivers.

But while there may be relatively few accidents with schoolbuses, it is also true that the accidents which do occur are more serious than they need be because schoolbuses are extremely shoddily built vehicles. In fact, schoolbuses are probably the most unsafe vehicles on the road. Passenger cars are generally better constructed, intra- and intercity buses are often better constructed than schoolbuses. There is no question that far more has been done to assure the construction of safe cars than has been done to assure the construction of safe schoolbuses,

[1] See p. 347.

which transport the Nation's children. There is little excuse for DOT's apathy and even antipathy to requiring the construction of reasonably safe schoolbuses.

The identical bills Senator Nelson and I have introduced in Congress, S. 2582, H.R. 11160, would require the accomplishment of four very basic and very long overdue goals.

First, our legislation would require the DOT to promulgate schoolbus standards in at least 10 specific areas: emergency exists, interior protection for occupants, including restraint systems, floor strength, seat anchorages, crash worthiness of body and frame, vehicle operating systems, windows and windshields, fuel systems, exhaust systems, and flammability of interior materials.

Why is this section of the bill necessary? Because the DOT has steadfastly refused to promulgate effective and comprehensive standards for the construction of schoolbuses, even though they presently have the authority to do so. Yet while the DOT has been unable to come up with meaningful schoolbus construction standards, the Vehicle Equipment Safety Commission—an interstate compact to which 46 States belong—has come up with a generally excellent set of standards which have already been adopted by a couple of States. VESC–6 "Minimum Requirements for Schoolbus Construction and Equipment." The VESC standards have been hailed by many experts as a giant step forward in building safer schoolbuses.

One schoolbus company, Ward Schoolbus Manufacturing, Inc., was so enthusiastic about VESC standards that it constructed a prototype schoolbus which conformed to the VESC standards. The Ward prototype schoolbus is clearly far more advanced in terms of safety than schoolbuses presently on the road.

As you know, the number and quality of rivets used in a schoolbus is one of the most important factors in determining the safety quality of the schoolbus. The Ward prototype schoolbus has more than five times the total rivets as the average schoolbus presently in use. The Ward bus also has about half as many structural panels as the average schoolbus.

By reducing the number of structural panels, and by overlapping them, as the Ward Co. has done, the possibility of the bus becoming a "cookie cutter" when it is involved in an accident, and causing severe lacerations to the children on the bus, is greatly reduced. The Ward schoolbus is also superior to present schoolbuses in many other respects.

The Ward Co.'s efforts to build a better schoolbus are particularly important because they convincingly demonstrate that safer schoolbuses are quite practicable. The company estimates that the added cost to the consumer of these improvements would be a rather negligible $390 per bus. For a $10,000 bus, this is certainly not too much when one considers the extra safety it would provide for the children.

The second thing our legislation would do is require DOT to build at least one experimental prototype bus within 3 years of the bill's enactment. Considering the relatively low cost of building such a prototype schoolbus, it is somewhat curious that DOT has not already agreed to do so. Certainly, building a prototype is not a new concept to DOT.

It has provided funds to build such prototypes as electric power buses, steampower buses, experimental safety cars, track air cushion

vehicles (trains), turbo trains, the Bay Area Rapid Transit System in the San Francisco-Oakland area, and the Coast Guard icecutter. Possibly building a prototype safety schoolbus is simply too mundane a project for the DOT.

I also understand that the Senate Commerce Committee is considering authorizing $1 million for the purpose of schoolbus crash-worthiness tests. I strongly support such a proposal with or without acceptance by the committee of our legislation.

I believe the crash-worthiness tests, however, would be far more beneficial if they were part of a larger plan including the construction by the DOT of a prototype schoolbus.

A third provision in our legislation would require that each manufacturer and distributor of schoolbuses testdrive each bus individually to insure that it is working properly and is in conformance with all applicable safety standards. At present, schoolbuses often get assembled at two or more different factories and no one is really responsible for the final product, which is not adequately tested, if it is tested at all.

If anyone believes that thorough testing of schoolbuses is not important, I would refer him to an article by Coleman McCarthy entitled "The Faulty School Buses" which appeared in the March 11, 1972, issues of the Saturday Review.

In this excellent article about one schoolbus operator's frustrations with poorly constructed schoolbuses, Mr. McCarthy details, "clutches burning out—wheels wobbling—tires leaking—bolts falling out of motor mounts—power steering failing—accelerator springs snapping—a waking nightmare."

With the chairman's permission, I would like to include this important article in the committee's hearings record.

A fourth provision in the legislation would require that DOT investigate and publicly release a report of each schoolbus accident which results in a death. One important purpose of this provision is to obtain data from schoolbus accidents useful in determining the structural weaknesses of schoolbuses so that safer schoolbuses can be designed and built.

While it does appear that the DOT is now doing a better job of investigating schoolbus accidents than in the past, this provision would set a reasonable minimum standard for DOT investigations of schoolbus accidents.

In summary, this schoolbus safety bill is very moderate and long overdue legislation. The House bill has been cosponsored by 80 Congressmen. It has been endorsed by a wide number of groups, including the National Education Association, the American Association of School Administrators, Physicians for Automotive Safety, Citizens for a Safer School Bus, the Vehicle Equipment Safety Commission, the National Safety Council, the Ward School Bus Manufacturing, Inc., and the Prince Georges County Public Schools.

Coleman McCarthy, in another article called "The Other Busing Problem," which recently appeared on the editorial page of the Washington Post, probably put it best:

> As (schoolbus) crashes continue, alibis for inaction become thinner. The problems are known, the technology is available. The undecided question is whether the sources of money needed for safety—school boards, state houses and Congress—think that saving children's lives is important. Meanwhile the busing issue gets more speeches than busing safety.

Senator COOK (presiding). Thank you, Congressman. As I understand it, what you are really saying is that even if we appropriate $1 million for safety tests on existing schoolbuses, all we are going to learn is the inadequacy of the present vehicle, and if you don't at the same time promote a program to develop a safe bus and test that at the same time, we are really not going to have anything we can equate with it.

Mr. ASPIN. Exactly. I think that if you had a testing program along with the requirement to develop a prototype, plus then follow it up with standards to be issued by the Department of Transportation, in the light of what they have learned from the prototype, that I think is a complete package.

Senator COOK. Let me ask you something, because after all schoolbuses are running off the line every day: Why would you want to give the DOT 3 years in which to build a prototype? Why not a year?

Mr. ASPIN. Well, 3 years seemed like a reasonable time to us in drawing up the bill, but if it is for, and you think it could be done in a shorter time, I would certainly endorse it.

Senator COOK. The thing that bothers me is that when the DOT starts building prototypes, it is going to cost more than $390 per bus to build it. That is what frightens the daylights out of me. I am afraid they are going to put the whole industry out of whack.

You know, it is like taking those exceedingly expensive automobiles with air bags that don't work and crashing them against the wall out in Arizona.

Mr. ASPIN. That is a danger. I would say that if it is the opinion of the committee or the opinion of anybody that this can be done in a shorter time, I am certainly in favor of doing it in the least amount of time possible.

Senator COOK. Is the Ward vehicle now a salable item? Is it available on the market?

Mr. ASPIN. No. It was just built as a prototype. It is not in production.

Senator COOK. They have one?

Mr. ASPIN. They have one, which was in Washington about a year ago. It was on display here in Washington for about a week, where people could go over and see it and look at it.

Senator COOK. Did you have an opportunity to see it?

Mr. ASPIN. Yes, I did.

Senator COOK. What kind of restraint equipment did they have in it?

Mr. ASPIN. The Ward bus was mostly in connection with the construction of the frame itself, of the structural structure: Numbers of rivets, the amount of overlap of paneling, these kinds of things, as opposed to specific interior design restrain equipment, the seats and things.

Senator COOK. As I understand it—and you may know more about it than I do, frankly—the basis now is that a bus manufacturing company buys a number of chassis. They get a raw chassis with an engine, and then they build from there, and we have no knowledge as to whether they have even tested the chassis when they get it. I know some of the things that you were talking about, for instance—clutches burning out, wobbly tires, power steering—all of these are standard items that would come from the major manufacturer in that chassis to the bus company.

Mr. ASPIN. Yes.

Senator COOK. So we have a two-prong problem here, then. One of them leads to the manufacture of the chassis itself, and then second is the manufacture of the body that goes on that chassis.

Mr. ASPIN. You are right, absolutely right.

Senator COOK. So we not only involve ourselves with the major manufacturers, Ford, Chrysler, and General Motors, but we have to then, after that particular phase is over, and after that particular safety check has been established, establish guidelines for the construction of that body that goes on that chassis.

Mr. ASPIN. Exactly right. A lot of the problem evolves because there are more than one manufacturer involved in the system somehow. It is not just the single item from one source, but something that comes in multiplicity.

Senator COOK. Then you run into the problem of the school district or the owner who complains to the manufacturer, he says, "Yes, that is not mine, that is General Motors."

Mr. ASPIN. The article by Coleman McCarthy that I have here that we will put into the record just points that out exactly. On several occasions he talked to the original person, and he was told, no—in fact, it was at General Motors—and they said no, that was not really our problem, that was the other fellow who put the thing together, and the other fellow said no, it wasn't, it was General Motors.

Senator COOK. What we are trying to talk about then is also the establishment of a single warranty, and not a multitude of warranties.

Mr. ASPIN. Yes.

Senator COOK. Well, I appreciate your testimony very much. I would like to see them do it in a year because I think they can do it.

Mr. ASPIN. Fine. Thank you very much.

(The articles follow:)

THE FAULTY SCHOOL BUSES

(By Colman McCarthy)

In the board rooms of General Motors, the world's mightiest corporation, decisions are routinely made that affect the lives of Americans in ways that the actions of Congressmen in Washington seldom do. By the hard measure of dollars, little doubt exists about the comparative importance of Detroit and Washingon. In a recent peak year, 1969, the board chairman of General Motors was paid $655,000, or fifteen times the salary of a United States Senator and more than three times what Americans pay their President. General Motors has $24-billion in gross annual sales (1969 figures), a sum larger than the budget of any of the fifty states or that of every nation except the United States and the Soviet Union. According to GM'st records, its cumulative profit from 1947 to 1969 was $22-billion.

One reason for the corporation's Gargantuan size—it has 55 per cent of the American automobile market—is that its customers keep coming back to buy its products, especially its cars, trucks, and buses available at some 13,000 GM dealerships. Many customers return because they have been conditioned to crave chrome, horsepower, and gizmos that GM puts into its vehicles. Others are the trapped victims of a corporate philosophy candidly described in April 1970 by former board chairman James M. Roche, forty-two years with GM: "Planned obsolescence, in my opinion, is another word for progress."

It is unlikely that any GM executive ever sends out memos to his staff saying things like, "Make the exhaust systems out of cheaper metal this year," or, "Order a lower-grade iron for the engine mounts." Yet in many cases he might as well, for underlyings in the auto industry are quick to divine the intentions of their superiors. In February 1969, GM was obliged to notify 5.4 million owners

to bring in their GM vehicles for correction of possible safety defects. Some 2.5 million of these were recalled to be checked for exhaust-system leaks. According to the Center for Auto Safety, the leaks were acknowledged by GM to have caused four deaths. The most recent GM recall, in January, set a national record: 6.6 million Chevrolets for possible engine mount failure. The Department of Transportation said it knew of 500 reports of such failures. The Public Interest Research Group, a Ralph Nader organization in Washington, reported at least six deaths and a dozen persons seriously injured in resulting crashes.

Down the line of corporate responsibility, someone had those thoughts about cheapening the exhausts and mounts, someone seconded those thoughts, and someone else carried them out. Death and injury resulted, and surely GM regrets it. Yet many millions of dollars of the $22-billion profit resulted also, and it is not likely that GM has regrets about that.

Consider the front bumper of the 1966 school bus, if a model in Washington, D.C., is representative. It is one-quarter-inch thick. On the 1969 model, it is one-eighth-inch thick. Thus in three years the bumper's thickness was cut in half. Considering the thousands of buses manufactured with the thinner and cheaper bumper, the savings must have been considerable. But so was and is the risk of injury and death to the thousands of school children who might be better protected with the thicker bumper.

Incredibly, as if more juice could still be squeezed from these lemons, the bumpers on these vehicles were the object of further GM cheapening. Behind the front bumper of the earlier model is a piece of steel extending from the frame in each direction about one foot, reinforcing the bumper. From the 1969 model, however, this piece of reinforcing steel is gone. And anyone who wonders why the 1969 bus rides so roughly need only measure the leaf springs that support the body. Compared to those on earlier models, the springs are seven inches shorter.

If GM cheapens parts that a layman can detect, what may it have done to parts hidden under the hood and within the chassis? General Motors, and its brother corporations such as Ford, Chrysler, American Motors, and foreign motor companies, assure prospective buyers that they can get into their products and go tearing off at high speeds. Yet between 1966 and 1970, some thirteen million vehicles, or 38 per cent of all vehicles manufactured, were recalled for possible defects. With 55,000 persons killed by automobiles in 1971 and nearly five million injured, it is reasonable to believe that not all the carnage was caused by drunk or wild driving. Much was doubtlessly caused by defective cars, and many of those defects resulted from decisions to cut costs.

One citizen who has experienced the cheapness of a GM product is John Donovan. Unlike most owners, who have only themselves or their families to account for when they drive, Donovan has responsibility for some 250 school children, the elementary and high school students he transports to and from six private schools in the vicinity of Washington, D.C. Ever since the famous Huntsville, Alabama, crash in May 1968, when the brakes of a GM school bus failed, killing one child, Donovan has watched his vehicles closely, servicing them frequently and driving carefully. At the time of the Huntsville tragedy, he owned two GM buses, and he didn't want any injuries or deaths due to faulty equipment or anything else.

A short, broad-chested man of thirty-six, born in Oklahoma, a former Marine Corps drill sergeant, brusque in speech, John Donovan first went to Washington as a student at Georgetown University. He stayed on, married, and wound up teaching at a private school—Ascension Academy in Alexandria, Virginia. Students there describe him as a friendly, approachable man with a skill for fairness and discipline. The graduating seniors twice voted him Ascension's most popular teacher.

Donovan began in the bus business in 1963 when a neighbor in the northwest section of Washington asked him if, for a fee, he would take his child to and from Ascension every day. Donovan agreed and took out the proper commercial-carrier insurance. He soon had other requests for the same service. By the 1968–69 school year, Donovan's business had grown; he spent $5,000 to purchase a 1966 GM sixty-passenger bus and a 1959 Chevrolet thirty-seven-passenger model.

In the spring of 1969, the chance to expand still further came along, so that with more school buses he could transport 260 children. The average yearly fare was $200. Many of the children in Donovan's buses were the sons and daughters of Senators, Ambassadors, judges, prominent lawyers, doctors, and other important and powerful Washingtonians. Encouraged by his wife and with confidence in his capacity for hard work, Donovan decided to buy three new 1969 GMC–V–6 school buses. Each cost $8,146.80. The body of this model was

made by an independent company; everything else—basically, the transmission, the wheels, the engine, the electrical system, the gas tank—came from General Motors Truck and Coach Division, Pontiac, Michigan.

Early in September 1969, Donovan went to High Point, North Carolina, to pick up his three new buses. Accompanying him were two drivers, as well as a GM dealer from Laurel, Maryland, from whom Donovan was buying the vehicles. On the return trip to Washington, Donovan had what he called at the time "a little trouble." One bus required sixteen quarts of oil for the 300-mile trip. On the second bus, things went fine until the accelerator spring snapped. This meant that the driver had to put the transmission into neutral, find a place to pull over, get out, lift the hood, and, with the engine still roaring, try to adjust the throttle spring with a pair of pliers. The third bus worked well until dusk, when the driver tried to switch on the headlights. They didn't work.

All of this irritated Donovan, but he understood that kinks are part of a new product and no cause for alarm. Except for rattling transmissions, Donovan's buses functioned normally for three days. He and his wife were proud of the buses. They had risked most of their savings on them and believed that no finer company existed than General Motors. Donovan named the buses after his wife, Virginia, and their daughters, Regina, who was three, and Colleen, just six months old.

In mid-September, as required by law, Donovan took the vehicles to be inspected before using them to carry children. One bus passed, two did not. One rejection was caused by a faulty brake-hose suspension. GM, Donovan believed, either had not installed the right part or had not installed any part. Thus, the brake hose, which is essential for stopping and which should be suspended several inches away from the wheel, was rubbing the wheel drag line on turns. Amazed that a slip like this could occur, Donovan was nevertheless grateful that the inspectors had caught it. "Thank God," he said to his wife. "Otherwise, the rubbing eventually would have broken the hose, and the brakes could have failed."

The second bus did not pass inspection because the exhaust-pipe hanger was faulty. It allowed the long exhaust pipe to dangle, thereby increasing the chances of its snapping. If it broke, carbon monoxide would seep out beneath the passenger compartment. "I thought the inspectors would be astonished, as I was," said Donovan, "that two brand-new General Motors buses, serviced by a GMC dealer, would fail to pass inspection. But they weren't surprised at all. They just said, 'Go get them fixed and come try again.' "

His amazement and annoyance slowly turned to dismay, for Donovan was serious about his responsibility for the lives of the children who rode his buses. Besides the Huntsville tragedy, Donovan knew of other failures of GM buses. Only the year before, eighteen children from the Accotink Academy in Springfield, Virginia, were riding in a new GM bus on Highway 236 in Annandale. The brakes failed. Somehow the driver managed to steer clear of traffic and coast the bus to a stop without an accident. The brakes were subsequently fixed three times by GM. The next year, another Accotink bus, a 1969 GM, was being driven along a highway in Fairfax County, Virginia, when the brakes failed completely. The driver steered into a pasture, and the bus lurched to a stop. *Those were new GM buses,* Donovan thought to himself, *and these three buses I just bought are new GMs, too.* His mind easily pictured one of his buses, full of children, crashing into a tree or into an oncoming car or truck. He became even more determined to do all he could to keep his three new buses in the best condition possible.

That commitment was made early in Donovan's ordeal, even though he had no way of knowing exactly what it would cost him—in loss of money, time, and peace. Between September 6 and December 6, 1969, according to Donovan's diary, he spent more than 225 hours either repairing the buses himself or hauling them to Central Motors, a GM dealership in Alexandria, Virginia. This averaged out to more than two hours daily, seven days a week. Additionally, he had to pay three of his drivers to do an extra ninety hours of repair work and hauling. A pattern emerged. When the buses finished the afternoon run about 4:30 or 5 p.m. and came to the parking lot in Washington, Donovan would ask what, if anything, had broken or malfunctioned that day. The drivers would tell him, for example, that the clutch had burned out for the second time, or that the left rear tire had leaked air for a second day, or that the bolts were falling out of the motor mounts the way they had last week, or that the wheels were wobbling, or that a gas tank was leaking, or that the power steering had failed.

The walking nightmare would now begin. Donovan would get into the broken bus and head for Central in Alexandria. Donovan's wife and two daughters would follow in the family car, so they could take him home when the bus was dropped off. It was a half-hour trip each way from Donovan's apartment in northwest Washington to Central Motors. After telling the mechanics what needed repairing, Donovan and family would return home. The girls would be fed and put to bed. He and his wife, staring at each other numbly, would have supper and wait for a call from Central—which stayed open until 2 a.m. The Donovans would wake the girls—no sitters were available at that hour—dress them, get in the car, and head for Alexandria. Donovan would pick up the repaired bus and drive it to the lot in Washington, his wife and children tailing. Donovan's records show that they made this trip approximately twenty-five times in the first three months of ownership. When two buses malfunctioned on the same day, two round trips were needed. Sometimes, since he needed to be up at 5:45 in the morning to call the drivers for the morning run, Donovan slept only three hours. During this period, both he and his wife lost weight, and friends found them unsually snappish. Donovan and his wife went out to dinner only twice in three months, and to a movie not at all.

The repairs made at Central Motors were seldom covered by the warranty. Trying to plug the dike through which money was beginning to flood. Donovan traveled to Laurel to talk with the dealer from whom he had bought the buses. "The dealer," said Donovan, "told me my buses were obviously special cases, that these problems certainly weren't universal." Nothing could be done, said the dealer except to notify the factory representative. Donovan called the GM public relations office in Washington and was told the man who would help him was John Nickell, the truck-and-coach field representative for that area.

Between the breakdowns of his buses, Donovan tried locating Nickell. He called several garages that were, according to the local office, on Nickell's list of places to stop. The response was always the same: Nickell either had just left or was expected at any minute. Donovan never found his man this way. Finally, in a stakeout, he went one morning to the leader's garage in Laurel, where the owner had said. Nickell was scheduled to appear that afternoon.

He did. Donovan momentarily elated at talking to a live GM face, detailed the problems, from the burned-out clutches to the leaky gas tanks. According to Donovan, Nickell's reaction at this meeting, and at several to follow, was astonishment—no other operators in his area were having these troubles; therefore, aside from warranty work, GM could not be held responsible. "It must be my drivers, Nickell told me," said Donovan.

Up against a wall and wanting his conscience to be clear if any of the buses ever crashed and perhaps killed someone, Donovan wrote a letter to the parents of the children he served." In order to facilitate safe transportation for your children with a minimum of maintenance expense," said the letter, "I purchased three new 1969 GM buses in September of 1969. It verges on the impossible to run the routes safely and on time. The reason is that these three new GM buses continue to break down. The vehicles have been fixed, refixed, and refixed. These malfunctions are not minor. They are major mechanical failures that often involve the safety of your children." He listed the problems and concluded: "If this patterns continues, we will have to discontinue the service."

A copy of this letter happened to come my way. I called Donovan and asked if I could examine his records and look at his buses. After several meetings in his apartment, I concluded that his complaints were valid. In any event, his anguish was real. He and his wife had put their savings into the buses, and now they appeared lost. One evening after school, Donovan asked me to take a drive with him in one of his lemons. "I'm only going to get it up to twenty miles an hour," he said, "and then I'll put on the brakes." When he applied the brakes, the bus halted with an abruptness that threw me forward. "We were only going twenty," said Donovan, opening the door and going around back. On the road were two black skid marks. The two rear wheels had locked when Donovan put on the brakes. "Can you imagine what happens," he asked, "when a bus is going fifty or sixty and the driver has to stop suddenly?"

After again looking through Donovan's material, I approached General Motors to get their side of the story and give them a chance to be heard. I tried contacting John Nickell. I left my name at his office several times, but my calls were never returned. I visited Central Motors one morning—"He'll be there all

day," said a secretary in his office—but like Donovan before me, I did not find Nickell that day or any other day. Workers at Central said that Richard Lockwood the service manager, coordinated with Nickell and that he perhaps could help me.

I approached Lockwood. He preferred not talking about Donovan's problems. "General Motors has official spokesmen for questions from the public. You ought to ask them." When pressed for any explanation of why so many parts on Donovan's buses kept breaking or malfunctioning, Lockwood said, "some of Donovans' problems are real, some are faniciful." Asked for an example of Donovan's fancy, Lockwood recalled a visit to him by Donovan when he asserted the clutch on one bus needed fixing. "We drove it around for a road test," said Lockwood, "and there was nothing wrong with it." When informed of Lockwood's statement, Donovan agreed; the mechanic did drive it around. "So I took the bus home, with no repairs made. Maybe Lockwood was right that time. But two days later the clutch burned out."

At 6:45 on the evening of December 9, Donovan phoned me at home. "Guess what," he said with elation, the first happy note I had heard from him since our initial meeting, "GM finally knows I exist. Three of their men are coming over to see me in an hour. They said they want to talk things over with me about the buses. That's all they said." Donovan asked me if I could come over and sit in on the meeting; it might be interesting. I said that I'd be there in twenty minutes.

When I arrived, the Donovans' were on the last bites of a meal of meat loaf, canned peas, apple sauce, bread, and milk. Their apartment, a third-floor walkup in a housing project, was in mild disorder, a crib in the middle of the room, a chair holding a drawer filled with Donovan's records, a filing cabinet in a corner, and a card table covered with invoices, receipts, and other papers. I asked Donovan why he thought GM wanted this meeting. "Hard to tell," he replied. "Maybe they see my complaints are real and they finally want to square it all up. I've heard of things like that happening."

"I haven't," cut in Donovans wife, Virginia, "especially not from a bunch like this. The bigger they get, the less they care." A short, sandy-haired woman, second-generation Polish, a user of short-bright sentences, Virginia Donovan was perhaps the wearier of the two. Home all day with the girls, she had to phone the parents when a bus broke down and inform them that their children would either not be picked up in the morning or be late in the afternoon. She had typed the letter to the parents as well as earlier letters to GM president Edward N. Cole, President Richard Nixon, Virginia Knauer, the Presidential consumer adviser, the Federal Trade Commission, and the National Highway Safety Bureau. She also had opened and filed depressing form-letter replies. "It'll be a snow job, John," she said. "Just wait and see. The drifts will be so high, not even a bus could drive through."

Donovan speculated that GM had heard, probably from Richard Lockwood or someone else at Central Motors, that I was looking into the problem. "They hate bad publicity," he said. "Just the thought of a possible story in a major newspaper has flushed them out. It's funny. GM hasn't really been so bad. They've done a faithful job on the work they say is covered by the warranty. The mechanics at Central are superb. I get fast service; they're courteous. The eerie thing is that I can't find any one who'll take responsibility for what's gone wrong."

At 7:30 the GM men arrived. Donovan, putting the infant in the crib and the three-year-old on a chair, went to the door and opened it. "Hello, Mr. Donovan," said the out-front man. "I'm Webb Madery of General Motors." Round-faced, heavy in the waist, he rubbed his hands briskly and commented on the cold outside. Madery introduced Jerry Fender and John Nickell. Donovan invited them in. The three were cheery, almost bouncy. Donovan introduced them to Virginia. Madery, with a large smile, said that he was happy finally to meet Mrs. Donovan and that everything her husband had said about her certainly seemed true. The woman did not respond to Madery's pleasantry. She knew her husband had spoken with him on the phone several times, but she was also sure her husband wouldn't have mentioned her. "What a nice little place you have here," said Madery, not letting up. He was unaware that the housewife didn't consider her apartment "nice" at all; she had told me five minutes before that her famliy would have moved into a house that fall if repairing the three buses had not consumed so much of their money, time, and emotions. Still icy, she took the gentlemen's coats and hung them up.

Of the trio, Madery was the oldest—sixty-two—and, as the Washington zone manager, was highest on GMs' ladder. His career in the automobile industry began in 1933. After one year of college at William and Mary, he worked for International Harvester, then Chrysler. In 1958 he accepted an offer from General Motors to become heavy-duty truck manager in the Detroit zone. A year later he moved to Washington.

Fender was a trim, short-haired man of fifty-eight, with the longest GM service of the three, having begun in Oakland, California, as a twenty-four-year-old factory helper. Slowly rising from the bottom, he became shop clerk, parts manager, and to on, eventually moving to Washington as zone service and parts manager.

Nickell, forty-nine and gray-haired, had started with GM in 1940 on the assembly line in the Pontiac truck plant. He also went to school at that time, earning a B.A. in history from the Detroit Institute of Technology. Then he became a parts supervisor and began his climb.

Standing in the uncarpeted living room of the Donovan apartment and not yet down to business, the three GM men continued their cheeriness. They said they had just come from a delightful meal whose main dish was pheasant under glass. "You'd really like pheasant," said Madery to Mrs. Donovan with an overwarm smile, apparently determined to thaw her somehow. The woman could still taste the meat loaf she had just cooked and eaten, so the news about pheasant had a contrary effect upon her.

Moving from the living room into the adjoining part of the L-shaped area, Donovan introduced the three officials to me. I stated clearly that I was a *Washington Post* writer and had begun investigating Donovan's troubles. Still engaged in the busy work of cordiality, the GM men did not seem to notice the significance of having a newsman on hand while they went about the work of customer relations. Only John Nickell, an alert, lively-eyed man, looked twice at me. My name may have been familiar, perhaps from the message slips of my phone calls. Yet, after shaking hands with me at the Donovan apartment, Nickell lowest of the three in corporate power but closest to Donovan's daily problems, seemed to let the fact of my presence pass. If his superiors weren't concerned, why should he be?

Everyone gathered around a small dining room table, everyone except Mrs. Donovan. She sat on a living room chair within hearing and took out yellow scratch paper, ready to take down in shorthand the important remarks of the conversation. The GM men produced a folder of records covering what they said was the past twelve weeks of Donovan's ownership of the three buses. As the senior official, Madery led off, explaining amiably that the reason for calling the meetings was that "GM wanted to make things right." He said that his corporation had a long record of being concerned about producing safe vehicles, especially those that carry children, and that since Donovan was concerned about safety, GM was most concerned about him. GM, he said, likes to satisfy its customers.

Impatiently Donovan broke in. "I've heard all that talk before," he said. "What I'd like from GM right now is a detailed record of the repairs you've made on my buses and also the modifications you've made on them." Donovan's request, made in a quiet but firm voice, was based on a desire to keep an accurate maintenance record. He explained that "this is the same as wanting information from your surgeon about what he cuts or takes out while operating on your insides. How can you find out unless the surgeon tells you?"

Madery laughed, saying with a final, happy grin that he had undergone operations where the surgeon never told him what he had fooled with. Donovan didn't laugh. On seeing this, Madery nodded to Nickell. "Mr. Donovan should certainly have his records," said Madery. "That's only fair." Nickell said he would get them to Donovan later that week without fail.

As the GM-Donovan case unfolded during the next year, the company never supplied Donovan the records he repeatedly asked for and GM repeatedly promised. In the week immediately after the December 9 meeting in the apartment, Donovan says, he was told by Jerry Fender that high-level officials in Detroit had made a decision not to release the records "at this time in these circumstances." The circumstances were that the first of my series of articles on Donovan and his plight had just appeared in *The Washington Post* and had been circulated by its wire service. Donovan believed GM refused to release the enormous record or repairs and replacements on the grounds that the public—

specifically other owners—would learn of it and thus expect similar treatment. Donovan never learned precisely who in GM ordered the embargo. The question came up again at a meeting in January 1970 in Falls Church, Virginia, with Robert Stelter, general sales manager for the GMC Truck and Coach Division, who entered the case when it became a public issue. Donovan says he asked Steiter directly why GM had refused to release the records. Steiter, the superior or Madery, said he himself never understood why. He directed John Nickell, also present at this meeting, to pass along the records. Nickell said he would, but he never has.

At the December 9 apartment gathering, the next topic was an itemized reading by Nickell of the repairs made at GM's expense. The list was long—including leaking oil gaskets, broken motor mounts, flawed gasoline tanks, ruptured rear-wheel seals, uneven brakes, bad tires, wobbly wheels, weak tailpipe hangers. Anyone not knowing the whole story would wonder why Donovan was complaining when GM had done all this work free of charge.

"What about those tailpipe hangers?" asked Donovan. Nickell, shooting a confident glance at his boss as if to say the question was a routine grounder and easily fielded, replied that GM had replaced them on warranty. "I know that," said Donovan, "but the replacements were of the same design as the original ones. So where does that take me?" For my benefit, and looking at me, Nickell explained in layman's terms the nature of a tailpipe hanger: a metal, straplike device hung from the frame of the bus and attached to the exhaust pipe to keep it from dragging along the road and breaking.

As this point, the smooth GM presentation showed signs, like Donovan's buses, of falling apart. The customer insisted on getting across his point that replacing a flawed hanger with another flawed hanger, however new, is not really a victory for safety. Visibly annoyed at wrangling over such a small item and apparently sensing a no-win situation, Nickell broke in to admit that "the hangers were just not strong enough. The factory made them too flimsy."

Madery looked sharply at Nickell—either startled or angered at this frank concession. He jumped in to say that studies of the hanger were already under way in Detroit and that a better one was being designed. Donovan said he was happy to hear that. He asked however, if GM was going to warn other owners of 1969 GM buses around the country that this particular part was made "too flimsy." Madery said the decision would have to be made by higher-ups in Detroit. "I'm sure they'll tell the public," said Donovan sarcastically, "because, as you say, GM cares about its customers and the safety of children." (The flimsy tailpipe hangers have never been recalled.)

All GM cheerfulness had now evaporated. The next topic involved the leaky gasoline tanks on Donovan's buses. Nickell reminded Donovan that three weeks earlier, to show GM's good faith, he had promised to repair the leaky tanks free of charge. That was a gesture of pure largess, Nickell made clear, because GM did not make the tank. Madery looked pleased. Nickell's statement backed up Madery's earlier one of wanting "to make things right."

"I'm not impressed," said Donovan, his anger growing. "After you told me that GM didnt make the gas tank that was leaking, I called up Thomas Body [Thomas Body Company, High Point, North Carolina, the firm that had produced the bodies for Donovan's buses and fitted them onto the GM chassis]. Mr. Thomas personally told me—categorically—that his company does not make the tank, GM does."

Nickell could do nothing but admit error. Coming back fast, however, Madery explained to Donovan that, even though Nickell was wrong about the maker of the tank, it actually didn't matter, because the leak was later found by mechanics not to be in the GM-made tank but in the extension from the tank to the exterior of the bus. "That is a Thomas product," said Madery firmly. He said that GM had nothing to do with it.

Donovan could not argue further, at least not then. The next morning, however, he was on the phone again to John Thomas. I also called Thomas within the week. Thomas said, with no equivocation, that his company did not make the tank extension, that it was a GM product. To be certain, I asked him to check his file and read over the phone Donovan's order page for the bus bodies; it was number 9–12202, and the facts again fitted. A few days after the apartment meeting, Donovan reported to the GM men what he had learned from Thomas. The officials, according to Donovan, just kind of passed it off, admitting they were in "error again but attaching no importance to it. But I attached plenty of importance to it.

I was being lied to. Not by the men who had anything to gain from the lies, but because it was corporate policy. Put me down, brush me off, keep me happy—but don't ever tell me the truth or give me new buses."

As the meeting continued, Donovan running through his list of complaints, GM running through their list of solutions, the question came up of whether or not these problems were limited to Donovan's buses. They had to be, said Madery; otherwise, GM would have heard from other owners. "What about Tom Gist and Billy Jubb?" asked Donovan, referring to two owners of 1969 GM school buses in nearby Maryland, with whom he had spoken at length about their mechanical and safety problems. Donovan remarked that both were experiencing difficulties similar to his own and that both said they had seen John Nickell. His memory refreshed, Nickell said that was right, he had seen Gist and Jubb. Their problems, however, were different from Donovan's, said Nickell. Once again Donovan could not refute this with absolute surety. The following day I called Thomas Gist in Sykesville, Maryland, the owner of two '69 GMs. As was so with Donovan's buses, the power steering was bad, riding was rough, the clutches and brakes needed constant adjustment and fixing. I mentioned Donovan's name, Gist recognized it, laughingly saying they were fellow sufferers. Billy Jubb in Pasadena, Maryland, owned four '69s and called them "the worst I've ever owned." Each had a broken clutch. What he said about clutches echoed John Donovan: "I'm always taking the damned things to the dealer to have them adjusted."

"How does GM explain all these failures of clutches?" Donovan asked Madery. "Driver abuse," replied the GM man, starting on a brief monologue about the many ways drivers ride the clutch, pump it unnecessarily, use it wrongly, Donovan replied, again with anger, that this his drivers were not heavy-footed amateurs who loved clutch-riding but were veterans of the road with at least five years' experience in driving trucks and buses. None had ever burned out a clutch on earlier-year buses. Thus, said Donovan, it was unlikely they would have ruined the clutches at the rate they were being ruined on the new buses: Two had already burned out in each of two buses; three had burned out in the third.

The talk went back and forth, Donovan repeating his concern for safe buses because children's lives were involved, Madery cordially reassuring him that GM had made things right with its warranty work and that this was a fluke problem. He had a way of feigning suprise, as if to say wordlessly to Donovan, "you're not actually saying, are you, that GM is not 'the mark of excellence'?" Not once did Madery or his two companions offer sympathy to Donovan or even admit there might be a safety problem. If a problem was admitted, it was inevitably "not safety-related." On specific points the reply was either, "Here, this is what GM has done, so why are you complaining?" or, "Here, you should have done this, and if you had, this problem would never have happened." Nor did the GM ever mention that their buses had been the object of recalls two years running and that this year was an extension of patterns of work developed then.

As the hour neared 10 p.m., Donovan was still spirited, but Madery, Fender, and Nickell, the taste of pheasant long gone, were tiring. As they tried to wind things down, the phone rang. Mrs. Donovan answered. "It's for you, John, from Detroit, person-to-person." Donovan took the phone and was greeted by Robert Stelter, Madery's superior. "He wants to know how things are going with my buses," Donovan remarked to the group. Answering Stelter, Donovan said the buses were just as much broken-down lemons as ever. The two talked for about five minutes, Donovan asking for his records and repeating that he worried about his brakes, clutches, gas tanks, wheels, and everything else that wouldn't stay fixed, no matter GM's diligence in repairing them.

I signaled Donovan that I would like a word with Stelter. Identifying myself and my intentions clearly, I asked Stelter how three new buses could be so flawed. The company, he replied, was doing all it could to make things right. Beyond making things right, I asked politely, would GM make things better and do as Donovan thought it should—replace the buses? The official seemed suprised that Donovan had even thought of such a solution.

After expressing curiosity about what kind of story I might be writing but careful to remain pleasant and assuring, Stelter asked to speak to Madery. As GM Detroit spoke to GM Washington, there was little but "Yes, sir" and "No, sir" from the latter. Madery concluded his conversation by saying he would call Stelter in the morning. The phone hardly back on the receiver, the GM official looked at me in astonishment: "You're a reporter?" I nodded, Nickell nodded too.

Abrupty, the GM began putting away the materials they had spread out on the table during the evening. The phone call from Detroit, apparently meant as final proof to Donovan that GM really cared, because his troubles had reached the ears of high powers in Detroit, had had the opposite effect. GM had learned that rather than having put down a customer, it had had instead fired up a customer, one who had the crust to interest a reporter in his troubles.

Madery rose, as did Nickell and Fender, and recapturing his earlier verve, smiled broadly at Donovan and said that the evening was certainly well spent. Madery even had one last happy word for Mrs. Donovan, throwing her a compliment about "what wonderful boys" the Donovan's two baby girls were. Donovan got the men their coats and saw them to the door.

I remained for a few minutes. Mrs. Donovan said, "Let's get the snow shovels and clear out this place." Her husband saw the evening a little less bitterly. GM now knew, he said, that it could not talk its way out. "They didn't refute a fact I threw at them. That's the test. They would have slapped me down hard if one fact of mine, one record, or one document, was slightly off. But they didn't. Sure, they tried to scare me off, calm me down. What do you expect?

After telling Donovan I would call him in a few days to check whether anything happened, I said good night.

My story of Donovan's ordeal appeared in the *Post* on December 15 and 22, 1969. On the day of the second installment, General Motors and the White House Office of Consumer Affairs held a joint press conference to announce two investigations of the 1969 buses, one by the government and the other by the company. The press conference statements of GM vice president Martin Caserio were oddly similar to the GM presentation at the Donovan apartment. Caserio said there were no complaints about the buses from other owners. Asked about the 1969 school bus that had suffered brake failure and careened into a pasture, Caserio said he believed the braking equipment on that vehicle was not the same as on Donovan's, adding, "I'm not certain about that yet." Like Madery, Caserio stressed GM's concern for safety. Thus, the faulty exhaustpipe hanger should not be classified as a safety-related defect, because if it broke the driver could hear the exhaust pipe clattering along the ground and have repairs made before any harm was done to occupants. (But what if it merely cracked?)

Reporters pressed Caserio on Donovan's problems. For the first time the company gave a little, Caserio conceding that some of Donovan's complaints were legitimate. But always added to these admissions was the qualifier, "They are not safety-related." One reporter listed all of Donovan's problems—from brakes to clutches—and said Caserio's claiming these were nonsafety problems was an "incredible observation." The press conference did produce one memorable statement: "GM," said Caserio, "does not duck any responsibility for the finished product that bears our name."

Two months later, on February 19, 1970, a total of 4,269 school buses were officially recalled by General Motors, including John Donovan's three. Also recalled were 21,681 trucks using the same model chassis. "Some of the vehicles," said the announcement, "will require installation of new brake-hose retaining springs. Some will require inspection and possible inspection and possible alignment or replacement of a rear steel brake line. A few will require both services."

At my request, GM sent me a list of forty-four owners around the country who operated more than five buses. When I called them (four people were not GM owners, and one owner couldn't be reached because he had been dead four years), I found that a recurring theme was clutch problems. One owner was a GM dealer who had so much trouble with his seven 1969s that in 1970 he bought Fords. Asked if he thought it odd for a GM dealer to buy a competitor's product he answered, "What should I do—keep on buying buses that I know are nothing but trouble?"

Within the next year, the GM buses were recalled two more times. The second call-in involved the brakes again—possibly faulty brake-fluid reservoirs that caused the braking fluid to leak out. The third recall was for possibly flawed clutches; the clutch linkage was found to be weak—meaning, in lay terms, that the bus could lock in gear and thus be unstoppaple.

In a simpler day a consumer with a complaint about, say, shoes, had only to visit the local shoemaker to get justice. "Here," the customer would say, "these shoes are falling apart." The shoemaker, because he was ethical or simply aware that word would spread through the village about his sloppy work, quickly repaired the shoes or replaced them. The exchange was straightforward and there

were no evasions. What's more, the shoemaker was *there*, he had a familiar face, he breathed, and the only separation between the consumer and him was his shop counter.

Things have changed. Seeking relief or redress from GM with its 750,000 employees is an agony. So it is with any large bureaucracy. The vice presidents at the top are protected from the consumers' complaints at the bottom by the mass of employees between; the latter will catch it first if the brass learns that the consumers are mad. So the vice presidents do not measure the company's success by the consumers' voice, as the shoemaker did, but by sales reports, profit charts, and the smiles of stockholders. If tens of thousands of cars are sold every year, the high-ups conclude that the public must be happy. Otherwise, why are sales up? When profits aren't up, however, or when management thinks profits can be bigger, the decision often made seems to be to cheapen the product. When such a decision ends in death, then the ethical numbness encouraged by the profit system becomes grimly apparent, and the need for remedy becomes urgent.

John Donovan's friends jokingly called him a "giant killer," since he had taken on GM and won. "Won? How can they say that" he asks. "never got new replacements from GM for my buses. I never got a cent for my lost time. They never compensated my drivers for the overtime spent in hauling the buses to the garage. They never even apologized to my wife for all those nights she spent trailing me over to Central Motors. What's even more chilling, after three recalls, I have yet to hear from the GM crowd even the slightest hint admitting they may be doing something wrong in the way they build buses. But lives are involved; those are not alarm clocks that they're selling.

"That's the true horror of all this—not that they tried to screw one owner like me. It's the corporate callousness. If I were in the business of making school buses—an engineer, a vice president, a local representative like Madery—and someone came along with proof that dangerous defects were in my product, well, I think I'd jump pretty quick to correct them before I had any blood on my hands."□

The Other School Bus Problem

(By Colman McCarthy)

[The Washington Post, Apr. 14, 1972]

As if school buses weren't getting enough national attention already—on school integration the recent crash in Valley Cottage, N.Y., suggests there is another kind of attention school buses ought to be getting: on safety. At Valley Cottage two weeks ago, four students were killed and more than 40 others injured when their bus collided with a freight train at an unguarded railroad crossing. By coincidence, no sooner had federal investigators arrived in Nyack for the inevitable "fact finding" mission than another team weighed in with the facts on an earlier, and bloodier, crash in Colorado. Taken separately or together, the two crashes are sad reminders that the lives of thousands of children are needlessly risked daily because of low standards for school bus safety. Campaigning politicians keep on with clever talk about who should have made any loud demands that the hauling be safe.

With 256,000 school buses operated by 275,000 drivers, and transporting 20 million children each day, the causes of unsafety are many. The Gunnison crash is almost a model in tragedy. First, the bus—a 1971 International Harvester (the same make used in 66 passenger vehicles for Washington public school children) was found by investigators to have had a history of both brake fade and difficulty in gear shifting. In this case, brake fade meant that after the hydraulic brakes were pumped three times—as the runaway bus descended a mountain slope—the braking power diminished. The driver, his brakes gone, tried to shift to a lower gear, but the bus was hurtling too fast for this. In panic, a well-meaning passenger rushed forward to pull the parking brake, but this effort only stalled the engine, putting the vehicle even more out of control. Federal investigators said brake fade was a definite cause of the crash. Although the driver was inexperienced, "this does not exempt the manufacturer (International Harvester) . . . from providing equipment systems with an adequate margin of safety." According to the Department of Transportation, some 1971 Harvester buses are involved in a current recall for possible brake failures.

The Gunnison disaster is only one of many examples of brake problems among school buses. A 1970 government report on a Huntsville, Ala., crash of a

General Motors school bus said the accident "occurred when the brakes failed" as the vehicle came down a hill. One child was killed. In 1970, GM recalled 4,000 buses for possible brake problems. They were recalled twice more, once for clutches and once again for brakes. (A local owner of three 1969 GM buses reports that last month he had GM put new brakes on one bus. The company did, and the owner took them to the safety inspection station. The brakes flunked. He took the bus back to GM for adjusting but they flunked inspection again. And a third time. They passed on number four).

A second abuse is that many school buses are driven by incompetent and untrained drivers. Gunnison is again a model. Investigators report that the 23-year-old driver "had only been driving school buses two weeks, had no previous formal school bus driver training, and had never driven this particular bus before." Parents want the best for their children, but the problem of drivers is one of small pay and awkward hours. Some states and school boards enforce strict requirements before a person is allowed to drive away with as many as 66 passengers, but other states are lax. Then also, driving a school bus is considered menial work. A recent study by Physicians for Automotive Safety says it is anything but. "Not only does a driver take a bus over a sometimes complicated route, and to a time schedule, but often has to keep in mind special instructions such as dropping children off at other people's homes instead of their own. To do all this, keeping order among as many as 100 children, and at the same time drive safely, requires a great deal of ability."

The question of discipline on the school bus has been talked about only in recent years regarding safety. At no other time during the school day, or any day, are so many children allowed to be on their own as on the school bus ride. How can drivers be careful about safety when wild kids are letting loose behind them—fighting, throwing things, bellowing and other reversions to the animal state? Children quickly pick up their parents feeling about the low status of the bus driver, and act accordingly, treating him like a servant. Occasionally, a bus driver, unconvinced of his supposed lowliness, will throw off an unruly student, letting him walk home—or more effective, forcing the child to phone up Dad at the office to come pick him up. Recently, in Norfolk, Va. plainclothes policemen began riding some school buses because more than half the school system's disciplinary problems were occurring on the buses. At Gunnison, a possible cause of the crash "was an internal distraction created by the noisy and rowdy behavior of the student passengers."

A fourth curse among school buses—also found amply in Gunnison—is their flawed design. Injury and death are caused by the lack of structural integrity in the roof and sidewall area of the bus. In laymen's terms, this means the bus shells are poorly bolted and riveted. Children are easily thrown from the bus on impact, or if they stay within, are vulnerable to knife-like edges as they are heaved about. Many believe that seat belts (which few buses have) are the answer, but in collisions, or even sharp stops, even belted pupils still strike the top horizontal edge of the seats in front of them. Faces, necks, chests and teeth are injured. A study at the University of California at Los Angeles said that seats now in school buses are unsafe and should be replaced by high-strength, high-back models.

Because safety costs money, the question of how safe school buses should be made is often left either partially unanswered or not answered at all. The Department of Transportation has limited funds and staff, so priority is given to automobile safety where the death rate is higher data show that there are as few as .05 fatalities per 100 million passenger miles of school bus travel compared to 2.1 fatalities for passenger cars. Yet the cost of safety is hardly prohibitive. Last year, two large companies that make school bus frames displayed in Washington a new type vehicle that met the most rigid standards for structural safety; one company—Ward Manufacturing, Conway, Arkansas—said the cost of its safer vehicle was only $390 more than the regular models, a small sum compared to the average bus price of $9,000 or $10,000. In Congress, Rep. Les Aspin (D-Wis.) has introduced a school bus safety bill that now has 79 cosponsors. Among other sensible proposals, the bill would establish for the first time federal safety design standards for all school buses.

As crashes continue, alibis for inaction become thinner. The problems are known, the technology is available. The undecided question is whether the sources of money needed for safety—school boards, statehouses and Congress—think that saving children's lives unconvinced of his supposed lawliness, is important. Meanwhile the busing issue gets more speeches than busing safety.

COSPONSORS OF REPRESENTATIVE LES ASPIN'S SCHOOL BUS SAFETY BILL

Bella Abzug (N.Y.)
Joseph Addabbo (N.Y.)
William Anderson (Tenn.)
Herman Badillo (N.Y.)
Nick Begich (Alaska)
Alphonzo Bell (Calif.)
Jonathan Bingham (N.Y.)
Frank Brasco (N.Y.)
John Buchanan (Ala.)
Phillip Burton (Calif.)
Shirley Chisholm (N.Y.)
George Collins (Ill.)
James Corman (Calif.)
Dominick Daniels (N.J.)
Ronald Denholm (S. Dakota)
John Dent (Pa.)
Edward Derwinski (Ill.)
John Dingell (Mich.)
John Dow (N.Y.)
Joshua Eilberg (Pa.)
Dante Fascell (Fla.)
Louis Frey (Fla.)
Cornelius Gallagher (N.J.)
Sam Gibbons (Fla.)
Seymour Halpern (N.Y.)
James Hanley (N.Y.)
Orval Hansen (Idaho)
Michael Harrington (Mass.)
Ken Hechler (W. Va.)
Margaret Heckler (Mass.)
Henry Helstoski (N.J.)
John Heinz III (Pa.)
Elwood Hillis (Ind.)
Frank Horton (N.Y.)
Robert Kastenmeier (Wis.)
Jack Kemp (N.Y.)
Peter Kyros (Maine)
Norman Lent (N.Y.)
Spark Matsunaga (Hawaii)
Stewart B. McKinney (Conn.)
K. Gunn McKay (Utah)
Lloyd Meeds (Wash.)
Ralph Metcalfe (Ill.)
Abner Mikva (Ill.)
George Miller (Calif.)
Parren Mitchell (Md.)
Robert Mollohan (W. Va.)
F. Bradford Morse (Mass.)
John Moss (Calif.)
Robert Nix (Pa.)
David Obey (Wis.)
James O'Hara (Mich.)
Alvin O'Konski (Wis.)
Carl Perkins (Ky.)
Bertram Podell (N.Y.)
Melvin Price (Ill.)
Henry Reuss (Wis.)
Robert Roe (N.J.)
Fred Rooney (Pa.)
Benjamin Rosenthal (N.Y.)
Edward Roybal (Calif.)
William Ryan (N.Y.)
Fernand St Germain (N.Y.)
James Scheuer (N.Y.)
John Seiberling (Ohio)
Robert Steele (Conn.)
William Steiger (Wis.)
Louis Stokes (Ohio)
John Terry (N.Y.)
Robert Tiernan (R.I.)
Victor Veysey (Calif.)
Joseph Vigorito (Pa.)
William Widnall (N.J.)
Charles Wilson (Calif.)
Jim Wright (Texas)
John Wydler (N.Y.)
Gus Yatron (Pa.)
Clement Zablocki (Wis.)
J. Herbert Burke (Fla.)

ENDORSEMENTS FOR THE SCHOOL BUS SAFETY BILL HAVE COME FROM THE FOLLOWING ORGANIZATIONS:

American Association of School Administrators, 1201-16th Street NW., Washington, D.C.; Mr. James R. Kirkpatrick, Associate Secretary
Physicians for Automotive Safety, 50 Union Avenue, Irvington, N.J.; Annemarie Shelness
Prince George's County Public Schools, Upper Marlboro, Md.; Mr. Carl W. Hassel
National Education Association, 1201-16th Street, NW., Washington, D.C.; Mr. Stanley J. McFarland
Citizens for a Safer School Bus, c/o Shiver, 56 Brookside Lane, Berkeley Heights, N.J.; Mrs. Marjorie Abramson
Vehicle Equipment Safety Commission, 1026-17th Street, NW., Washington, D.C.; Mr. Harry H. Brainerd
Ward School Bus Manufacturing, Inc., P.O. Box 849, Highway 65 South, Conway, Ark.; Mr. Charles Ward
National Safety Council, 425 N. Michigan Avenue, Chicago, Ill.; Mr. James P. Kielty

Senator COOK. Mr. Charles Pulley, president, American Safety Belt Council.

Mr. PULLEY. Good morning, Mr. Chairman.

Senator COOK. Good morning, Mr. Pulley. I have a task I didn't know I was going to get when I came here this morning.

STATEMENT OF CHARLES H. PULLEY, PRESIDENT, AMERICAN SAFETY BELT COUNCIL, WASHINGTON, D.C.

Mr. PULLEY. OK, sir. I am the former president and vice chairman of Urban Industry which is a development firm engaged in the development and manufacture of automobile occupancy restraints. I am here today in my capacity as the president of the American Safety Belt Council. This is a group representing the manufacture of seatbelts and other occupant restraints.

I certainly appreciate this opportunity to appear before the committee and voice the views of our council on certain aspects of the Nation's highway safety program.

Mr. Chairman, I would like to offer for the record a formal statement, and restrict my remarks merely to a summary of our position on this matter and then be available for any questions.

Senator COOK. The formal statement will appear in the record in full.

Mr. PULLEY. Mr. Chairman, I am not here to offer criticism, but actually to plead for a more rational approach for occupancy safety in the Department of Transportation.

I think every one of us are aggrieved and shocked to learn that in the first quarter of 1972, it was the most gruesome in our highway safety record. There were 11,880 Americans killed in that 3-month period; another 400,000 suffered disabling injuries, and this all at a cost of something like $3 billion to our economy.

The DOT estimates very tragically that at this rate that nearly 58,000 Americans are going to die this year. What is even more frightening is that the rate of these fatalities, the number of accidents or the number of fatalities for a million miles has reversed, or is going up again, for approximately the last 2 years. Needless to say, this is of greatest concern to every one of us and obviously of the greatest concern of all, to the National Highway Traffic Safety Administration.

However, we feel that NHTSA in its zeal has come up with solutions to pass restraints and the American public has been lead by the DOT along a rosy path in the future which includes concepts that are far beyond the current production feasibility.

I think no place is this more evident than in the DOT's own test of air bag operations. This is reported because of the failures. Here you have a case, Senator, where an item ought to work under the most perfect conditions, and if they won't work under those conditions, we are gravely concerned that they will work under the best conditions of real world highway experience.

It is a tragedy that the number of highway deaths is rising, particularly because a large majority of these motorists have available to them life saving belts. In nearly every case, belts were available to these victims in the cars in which they were injured. All along, DOT's interest has always been on new devices rather than getting people to make use of the devices that are proven and available to them right now.

It is really tragic when you consider that we have expected 200,000 more Americans will die on our highways unnecessarily in the years that it is going to take to phase in these devices and make them available to the majority of the people.

In other words, these devices when perfected will not be available for the majority of American motorists for a period of 6 to 7 years from now. It is unnecessary because the technology exists to get people to buckle up now and to get them to use their shoulder harnesses and lap belts.

And we feel, here, Mr. Chairman, that the Federal Government is by far the best agency to bring together all of the resources to cause this to happen.

Up until now, there has never been a real concentrated public education promotion of automobile seatbelt usage. It has been a piecemeal sort of hit-and-miss affair.

We feel that a massive promotional education program sponsored by the Government is one of the most important keys in getting the greater use of these automobile seatbelts in this interim period.

Secondly, we would like to see the Federal Government's urging of mandatory seatbelt laws on behalf of the States. We are gratified that recently Secretary Volpe has included mandatory seatbelts as part of the safety standards for recommendations to the States. We are hoping he will use the means at his disposal to urge and promote this on behalf of the States.

The third thing is the greater use of mechanical means. Public education which is often faulted has really been a great success when you realize that tens of millions of people are wearing belts today. We feel that it is too slow. There are mechanical means of greatly increasing seatbelt use quickly and automatically. I am sure that in the course of these hearings, you have heard or will hear a great deal about DOT's test programs and their programs for passive restraint.

However, my prime purpose here today is to call attention to what we consider a very serious defect in the current passage of standards; namely, it eliminates entirely the requirement for safety belts in cars.

We certainly feel that the best interest of the public is served if at the very least, Federal safety standards require lap belts in all new cars even if they also have passive systems, such as air bags, until it is proven that the passive system will do everything claimed for it. The weight of evidence to date indicates to us that there is a serious question about the reliability of air bags and their effectiveness in all types of crashes. There are many modes of crashes, such as rollovers and so forth, in which the air bag has little or no effectiveness.

And furthermore, even the greatest proponents of the air bag indicate that the use of a lap belt greatly increases the efficiency of that bag system; that is, by keeping the occupant in the proper position to accept the protection of the air bag.

I think you may realize, or you may not realize, that most of our members of our organization are deeply engaged in the research and development of air bags and other passive restraint systems. This has caused us to have a very high regard for the potential of the job they might do, and at the same time, has instilled in us the deep sense of enormity of the problems and the complexities to be resolved.

We realize, Mr. Chairman, that you are proposing legislation that would assure motorists of the availability of safety belts in care that might have passive restraints. We think this is a very meritorious proposal. It seems to me that a most—it could be a very prudent and reasonable approach to this very difficult matter. We concur with you and

believe that air bags, or whatever devices are decided upon, that lap belts be continued to be a mandatory safety equipment in all automobiles. With that, Mr. Chairman, I would like to open myself to any questions that you might have.

Senator Cook. Mr. Pulley, it is my understanding that you have just attended the DOT's auto safety meetings out in California. Can you kind of elaborate on some of the discussions that went on in those meetings?

Mr. Pulley. The meeting itself, Senator, was concerning diagnostic inspection of automobiles. That was the main theme of this seminar.

However, Mr. Toms addressed a group there and Mr. Ed Cole, the president of General Motors, addressed a group.

A couple of very interesting things evolved there. Mr. Cole up until now has been very hard in his position that the air bag could be developed to meet all the requirements necessary, and he has been an outstanding advocate that seatbelts were not required.

We found a very major change in his position. He voiced to the press and to the meeting there that there were still some very serious problems in connection with the development of the passive restraint system, such as air bags. He named three of them and talked about the fact that absolutely no work had been done on rear seat restraints, although the law requires them to be incorporated in the 1976 models. He indicated he is deeply concerned over the aging; namely, that this system has to be able to work, 7, 10, 12 years from now.

And for the first time, he indicated he wasn't sure if and when these problems could be resolved.

And also, this is the first time I have heard Mr. Cole indicate that he and his corporation were very interested in anything that would increase seatbelt usage, and that they would go on record as promoting and advocating mandatory seatbelt use by the States.

This to me seemed to be a major change in Mr. Cole's position. I also found that Mr. Toms in his remarks seemed far more sympathetic to, first of all, the mandatory seatbelt laws, and to interlocks, and means of increasing seatbelt usage.

Up until now, it seems that the DOT had devoted all of its time, energy, and money, to the passive restraint systems. I find now that as these failures come along and they get deeper and deeper into the problems, they begin to realize the problems, and it does seem to be a softening of the very hard position they have had in the past.

Of course, Ford and Chrysler have always maintained that the lap belts are required in order to make an air bag work. I was surprised to learn that the Secretary's own advisory council recommended to him a year ago that under all circumstances lap belts should be retained with any passive restraint system.

Senator Cook. Well, you are right about the success so far, because I talked to Mr. Toms yesterday about the Wayne State Test, and about the Phoenix Test, and also about the fact that they conducted apparently—and I don't like to use the word secret—but a secret test on the 31st of March. My office has attempted, without success, to get data from those respective tests. We have not had them available to us.

One can only assume that their March 31 tests were no more successful than the other two or we certainly would have heard about it.

Mr. Pulley. I checked into that, Senator, because I heard the same

thing and I am told that the March 31 test involved the AMF safety car, and although the statement went out to the press, all systems worked, we are told that the air bag deployment was erratic and was also delayed to the degree that some of the dummies in the car certainly suffered serious injury any may have been killed.

And although it is one thing to say all systems worked, it is another thing to say whether or not the occupants were either seriously injured or killed. So, all the indication that we have is that that first test was also a failure, as well as the subsequent tests, which I think was April 25.

Senator Cook. Well, I think we are getting to it because after all, even in the Allstate ads that we see, the utilization of air bags, you will notice that all occupants always use seatbelts, and to this extent I think they further the argument that you have presented to us this morning.

Do you know if there is any difference in the level of protection that a motorist might have with seatbelts as opposed to air bags alone?

Mr. Pulley. Yes, Mr. Chairman. Actually, the seatbelt or the seatbelt shoulder harness offers superior protection. The air bags does a good job in frontal positions but even the most enthusiastic supporters agreed that they offer very little protection in a side collision or a rear collision or rollovers and most important, Senator, in that second collision.

As you know, the air bag inflates and deflates almost instantaneously and many times maybe you swerve and hit a small tree or something, enough to trigger the bag and it then deflates, and then you have no protection when you collide with another car.

So in these types of accidents, the seatbelt actually offers superior protection.

Senator Cook. As I understand what you are really saying is that if they can perfect an air bag, you are just as enthusiastic about an air bag as anybody else.

Mr. Pulley. Absolutely.

Senator Cook. But what you are really saying to this committee is that an air bag alone is not going to solve the problem.

Mr. Pulley. We see no evidence that it will as yet. Up until now, Senator, there has been no real world testing. Ford Motor Co. has produced 1,000 1972 Mercury's with air bags in it, and they would only buy these cars with air bags provided they also had seatbelts in the front seat and interlock systems, which makes it impossible to start the car unless the belts are hooked up; 200 of these are now being driven by Allstate's salesmen.

This is the first time any real world testing has been done. But they tell us that for a test to be valid, you need a minimum of 200,000 test cars on the road. So, we feel this thing has great potential, but our attitude is let's don't get rid of the proven, available, inexpensive things until it is proven, and more important, let's get the Government behind this now and promote its use.

Do you realize, Senator, last year, had 90 percent of the people been wearing the seatbelts, 19,000 more Americans would have been alive today, to say nothing of hundreds of thousands of people who wouldn't have been disabled and disfigured.

It is so easy to say why people don't wear belts, but it is time that all of us get behind the idea of promoting what is available and proven right now.

Senator Cook. What has been the public reaction to the buzzer warning system introduced this year?

Mr. Pulley. I have just been on a number of television and radio programs, Senator, and I have been amazed to learn how many people say that they bought cars and had never worn a seatbelt before and now are wearing them because of the buzzer. On the other hand, a number of people called in and complained about the warning system. I think a lot of these were put on cars with very little previous information and instruction. The automobile companies, the Government, never bothered to tell people what they were supposed to do. So, a lot of people were irritated.

But on the other hand, we are finding that many, many people who never wore belts before are wearing them because of this buzzer system. The reaction seems to be, Senator, the first couple of times you are irritated by it but then you start buckling up and then it becomes a matter of just adjusting your drive, your air conditioning, or starting your car.

The first results are very encouraging.

Senator Cook. The thing that interests me when you talk about Mr. Cole's remarks to you in California, there seems to be no coordinated effort between the DOT and the manufacturers to get to the dealer level. For instance, all you have to do is buy a car, and the salesman says if you don't like this, all you have got to do is lock it behind you. It seems to me, if you are going to overcome this system, unless you are going to move to the interlock system, that instead of allowing that unit to be locked behind you to cutoff the buzzer, that so much of the strap has to be pulled out that would normally go over an individual or a child that it would be too much before the buzzer could be triggered off.

Mr. Pulley. The answer there requires the hooking up of the buckle. Now, that was originally proposed by our council to the DOT. The DOT went to a cheaper, simpler method. We think going back to the buckle hooking-up requirement will go a long way to overcoming that. And in his speech, Doug Toms indicated that perhaps just detracting would not do the job.

Senator Cook. I find that it is very simple, and if the education program is really going to succeed, it not only has to succeed at the driver level, but it has to succeed at the manufacturing level and at the sales level, first.

It seems to me if we could get one manufacturer to start an intensive program at a dealership level to convince the guy who sells the automobile, frankly, of the safety features of this, and not show him how to get around it, and not, for instance, have that dealer tell you how you can disconnect the buzzer, that instead of having a negative reaction at the dealership level, that if we are going into really an educational program, that DOT ought to get busy at that level.

Mr. Pulley. Senator, I think you are going to see some improvements there. We met with the top officials of Ford about a month ago, and they were frank to say: "We have done a lousy job in telling our customers and telling our salesmen about this warning system

"We will get busy and do a better job now."

They are sending out publicity, sending out news releases to their dealers. At the same time, our council is dealing with the National Automotive Dealers Association and meeting with those groups and talking before their groups in order to promote this.

You are absolutely right there.

General Motors has promised to do a better job on it, too. First they said, "Well, it is in our manual."

As you know, Senator, no one reads the manual until they are in trouble. So they are going to put a sleeve on the sunvisor, and all have agreed that this system has not had the proper promotion and not had the proper publicity that it should have.

And with the starter interlock system coming in the 1974 models, we have got to do a better job, otherwise, the public gets something that they don't know what it is for, except as a source of irritation.

Senator COOK. I don't see why you put a sleeve on the visor. I don't see why you don't put it right on the visor.

After all, they put the name of the automobile all over the automobile. You go down the street—the automobile tires have the name of the manufacturers so prominent on the tires now, they haven't got room enough to put a white sidewall.

You know, you are a riding billboard for the guy that you buy the automobile from.

If you would just like to go buy an automobile and not let anybody know what kind you have got, I don't think there is a way in the world you could do it.

So it seems to me the sleeve is an easily removable thing. I don't see why you don't put it right on the visor itself.

Mr. PULLEY. One of the groups that has helped us is the rental companies, and they have all agreed, because they realize the liability they may have, and all of them that we have talked to have agreed to cooperate in developing these interlock, warning systems, because they see a real benefit to be gained by themselves on it.

Senator COOK. There is one thing that you and Mr. Toms agree on, and that is that if more people would use seat belts, there would be far fewer deaths, far fewer serious injuries. He said the same thing yesterday that you have said this morning.

Now, what you are saying is that it is possible to have a program to get more people to use belts.

Mr. PULLEY. Absolutely.

Senator, on several occasions Mr. Toms has said if we could get seat belt usage up to 75 or 80 percent figures, we wouldn't have to worry about these other systems. And we really believe that through a promotional level at all levels, at the employer, at the school, at the clubs, and sponsored by the Government, with mechanical means such as you and I have discussed, and urging mandatory seat belt laws, that we can get an increase almost immediately, real quickly.

About 14 months ago, Australia passed mandatory seat belt laws. At the end of the first year the reports indicated that seat belt usage had gone from 30 percent to 74 percent in the urban areas, and that the fatalities had dropped something like 24 percent, and this is a result of just the first year in New South Wales.

So the benefits are available almost immediately to us. We don't have to wait. We have got to quit sitting around saying why it won't work and take a positive attitude toward the thing.

Senator, we have paid the bill. There are a half a billion belts out there in the cars. Those bills have been paid for. All we have got to do is find a way to get people to use them.

Senator COOK. What you are saying is it is a hell of a lot more important to have a law in the respective States that it is mandatory to use seat belts than it is to have a law where you get fined $5 for having a defective muffler, and it seems rather silly that you have that law when you don't have a law that says people should protect themselves.

What about passive belts?

Mr. PULLEY. In the past years, they have come a long way; people have reacted, realizing the problems of the passive air bags, and passive belts now offered have definite problems. The only thing is they are most easily used in front seats and bucket seats. We have not solved the problem of rear seat passive belts, but on the other hand, the automotive industry hasn't begun to solve the problem of air bags in the back seat.

Senator COOK. Those air bags in the back seats are going to have to be well hidden, aren't they, because mostly children are in back seats, and that can be quite an explosive toy to have in the back seat of an automobile.

Mr. PULLEY. Also, Senator, the back of the front seat has to be completely redesigned. At least, in the front seat you have got something to fire against, but it means a major redesign of the back of the front seat.

We find no one even concerning themselves with the problem, and it is scheduled for 1975.

Senator COOK. Has your organization considered what role the ignition interlock system might play as a viable alternative to passive restraints?

Mr. PULLEY. Yes. Both the Government and Ford have run very thorough tests on interlock systems. They have found that—we feel that the starter interlock system is a quick, inexpensive means of dramatically increasing this use.

We think it is one of the most easily accessible, quick means of doing it.

But as I understand the DOT regulations, this wouldn't be passive, because they eliminate anything that requires any action on the part of the person, and, of course, we feel that is a case of semantics. If you can't start your car, or you can't put your car in drive unless you are hooked up, we don't see what the difference is, whether it is called a passive system or an active system.

Up until now that system has not been accepted under the docket 69–7.

Senator COOK. I hate to tell you, if we get a lot more regulations that is going to be considered the active-passive system.

Thank you, Mr. Pulley.

We have a rollcall.

We will stand in recess.

Mr. PULLEY. Thank you, Mr. Chairman.

(The statement follows:)

STATEMENT OF CHARLES H. PULLEY, PRESIDENT, AMERICAN SAFETY BELT COUNCIL

Mr. Chairman, my name is Charles H. Pulley. I am president of the American Safety Belt Council, representing manufacturers of automobile seat belts and their components, as well as other occupant restraint systems.

I also am the former president and currently vice chairman of Irvin Industries, Inc., an international firm engaged in the manufacture of safety belt systems, and research and development of passive restraints for automobile occupants.

I wish to thank you for the opportunity to be here today to present the views of the American Safety Belt Council concerning certain aspects of our nation's highway safety program.

The Council was formed a decade ago principally to encourage wider use of life-saving safety belts and thereby reduce highway fatalities. Long before the federal government required the installation of seat belts we made our commitment to providing the most reliable and effective occupant restraints possible.

Through the Council, knowledge derived from our members' research and development activities as well as sponsored research has been focused into comprehensive educational programs for the motoring public and technical commentary for governmental role-making bodies. Our ultimate objective has been and is to reduce the tragic toll exacted on our highways each year by motor vehicle accidents.

Mr. Chairman, I am here today not to offer criticism but to plead for a more rational approach to occupant safety in programs designed and carried out by the Department of Transportation and its National Highway Traffic Safety Administration.

To some degree the American public has been led by DOT along a rosy path into a future that includes concepts in people packaging and auto safety far beyond production feasibility. Unfortunately, these have been so widely and intensively promoted that the public's perspective on reality has been dimmed.

I sometimes wonder if there isn't reason to question the clarity of the Department of Transportation's perspective as well. Perhaps the best example giving rise to doubt was the recent series of tests of the highly-touted air bag conducted by DOT and university researchers—the inflatable cushion we all have been told is going to solve the highway massacre problem. In three tests, two of them involving DOT's hand-crafted Experimental Safety Vehicle, to the accompaniment of much ballyhoo by DOT officials, we understand that the bags failed miserably and the "dummy" occupants were killed and injured. And yet, we were assured by both the Secretary and the Administrator of NHTSA that there is no cause for concern, that the problem was simply a matter of human error creeping into the system.

Human error, Mr. Chairman. No one has yet explained, if we can't produce one-of-a-kind cars by the industry's best experts, how we will mass-produce 100 million a year without human error that may lead to the deaths of many motorists.

We are grieved by reports that the first quarter of 1972 was the most gruesome in highway history. There were an estimated 11,880 people killed, a seven percent increase over the previous year, and some 400,000 people who suffered disabling injuries. March deaths alone were up 12 percent. The estimated cost to society in the first three months was $3 billion. These are National Safety Council estimates. Think what it will be by the end of the year, when we will be faced with the prospect that nearly 58,000 people will have been killed.

The real tragedy in all of this rests in the fact that nearly every motorist on the roadways of our country has a seat belt available to him. And most also have a shoulder belt. If they used them, between 10 and 20,000 people might not be killed each year.

Another part of the tragedy is that in DOT's zeal to find an answer to the problem in the so-called "passive restraint" it has created a question in the minds of many people as to the value of safety belts. Constant promotion of the new, highly sophisticated, extremely technical devices, such as inflatable air cushion passive restraints, has led many people to believe their belts are not helpful, and consequently they don't bother to use them.

Mr. Chairman, we believe the concept of inflatable restraints has great potential, and we wholeheartedly support continued research and testing to perfect them.

Nearly all of the Council's member firms fully expect to be suppliers of air bag systems or components and many have had active air bag development programs for some time. The tens of millions of dollars invested in air bag research, development and testing, and in equipment and facilities, gives evidence that we recognize the contribution these devices can make in the effort to save lives and reduce injuries.

But, our substantial commitment in the field of passive restraints has also given us a high regard for the enormity and seriousness of the problems still to be solved before they become truly viable systems.

I mentioned earlier that the Department of Transportation has crashed two Experimental Safety Vehicles. I have been told that in both the air bags failed to do their job. In the first crash, conducted in private, I have been informed that some test dummies were injured or probably "killed." In the second, the air bags failed to deploy at all, as widely reported in the press, and all the dummies were apparently killed. A third demonstration, conducted at Wayne State University especially for newsmen, also ended in failure.

In its rush to require passive restraints, DOT has decided that safety belts are no longer necessary. Cars made after August 15, 1975, are to be equipped with air bags or other passive restraints and manufacturers are relieved of any responsibility for installing safety belts.

We find this alarming and we are gravely concerned about the safety of million of American motorists because air bags can not be shown to be effective under the most ideal of test conditions, let alone in all crash modes and under real world conditions.

Without safety belts, occupants of air bag equipped cars will not have the same high level of protection against death and injury in all the various kinds of accidents—frontal, lateral, roll-overs, and second collisions. And because air bags or other deployable devices will actuate only above certain speeds, any accidents or other situations in which protection is needed occurring below the threshold speed may put the occupants at the mercy of the crash elements.

This is why the Council is wholeheartedly supporting Senator Cook's proposal to maintain belts with bags until such time as the Secretary of Transportation has sufficient evidence based upon actual use in "real world" situations that the passive restraint is reliable, effective, and efficient.

It is interesting to note that even the Secretary's own expert advisory group, the National Vehicle Safety Advisory Council, has recommended that belts be maintained with passive restraints.

With a safety belt as a back-up system in cars outfitted with passive restraints, the safety of millions of Americans will be assured. I think you will agree with me that we can't be too safe.

But the point can still be raised: People don't use their belts.

To date, we have used only the processes of mass communication to promote safety belt use. And whether you accept the statement that says 40 percent of all motorists regularly wear their belts, or the ones reporting 25 or 17 percent use, when you translate these percentages into the millions and millions of people they represent, you cannot easily dismiss the public education effort of the past five years as a failure.

Gentlemen, a three-point harness system, configured with a sequential logic ignition-interlock, can be as effective when it comes to saving lives, as any "passive" restraint, and the rate of use will be very high.

Tests conducted by the Ford Motor Co. in the cities of Houston and Minneapolis, and a similar program conducted for GSA by the National Highway Traffic Safety Administration have both demonstrated beyond doubt that the ignition-interlock system would dramatically increase safety belt use to the 75–90 percent rate that is desired.

The ignition-interlock is a simple, readily available means of increasing safety harness protection. It requires no extensive long-term development, can be adapted to various model cars, and can be installed in production quantities for very little cost over present systems.

This mechanical device makes use of a restraint system which is fully proven and has the added advantage that it can be retrofitted to older model cars that already have safety belt fittings.

The other means of quickly and dramatically increasing safety belt use is to require at least the drivers of motor vehicles to use their safety belts.

We were pleased to see that Secretary Volpe has taken the lead in this area by approving a revision of the standards which includes a recommendation that states enact mandatory seat belt use laws.

A couple of years ago, such laws were dismissed as unfeasible and unenforceable. Today the climate has changed. Among proponents and supporters of this concept are the National Safety Council, Ralph Nader's Center for Auto Safety, the nation's automobile manufacturers, and many insurance groups.

In Victoria, Australia, where a mandatory use law has been in effect for nine months, fatalities were cut 24 percent. Seat belt use sharply increased to 75 percent in metropolitan areas. Rural use jumped to 64 percent and deaths dropped 13 percent. And New Zealand recently enacted mandatory use legislation.

Authorities find the law no harder to enforce than that of driver licensing or car registration laws. They find that the vast majority of citizens comply simply because it is the law.

Several states have had legislation introduced to require mandatory safety belt use and in view of the success Australia has had with such a law, we expect many other legislatures to consider the matter in the coming year.

The American Safety Belt Council is convinced that mandatory use laws, combined with a comprehensive, national educational program aimed at every segment of the society, and advanced belt systems featuring ignition-interlocks, could save many thousands of lives each year.

Safety belts are the only available occupant restraints tested and proved effective, economical and efficient. The sooner we are convinced to be required to use them, the sooner we will see a marked decrease in fatalities and serious injuries.

Mr. Chairman, under the present timetable for passive restraints, it will be at least 10 years before most people have access to them. It takes time to flush the older cars out of the system. In that period I would estimate that at least another 200,000 people will be needlessly killed in auto accidents.

I am confident that if the Congress actively encouraged DOT to move full speed with promotion of mandatory use laws, encouraged DOT to retain safety belts in all new cars made after the deadline for passive restraints, and provided DOT with the means to carry out a national program to increase belt use, each of you would have several thousand more constituents at this time next year.

(Whereupon, at 11:15 a.m., the hearing was adjourned subject to the call of the Chair.)

AUTO SAFETY OVERSIGHT

TUESDAY, JULY 25, 1972

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C.

The committee met at 10 a.m. in room 5110, New Senate Office Building, Hon. Vance Hartke presiding.

Present: Senators Hartke and Cook.

OPENING STATEMENT BY SENATOR HARTKE

Senator HARTKE. Good morning.

I want to say first that I am sorry I am a little late, but I was over at the Veterans Committee where we have just reported out what we consider to be one the most significant educational bills, in the veterans affairs. It raises the benefits for GI's from $175 a month to $250 a month, and I hope that you will bear with us in trying to take care of them, too, at the same time.

Due to the Senate moratorium on hearings for the balance of this Congress, this morning's session will complete the oversight hearings on the National Traffic and Motor Vehicle Safety Act. We are going to try to condense into today's hearings that which we originally had planned to take 3 days to do, and we may take the rest of the legislation at a later date.

We have also invited Mr. Douglas Toms, Administrator of the National Highway Traffic Safety Administration, to return to the committee so that we may continue our oversight hearings which were begun last Wednesday. I plan to continue our questioning on passive restraints and explore other areas including recalls, schoolbus safety, motor vehicles in use, and defect investigations, just to name a few.

I will be unable to ask all questions and will accordingly submit some of these questions to Mr. Toms to be answered for the record. I also plan to spend some time reviewing with Mr. Toms and members of his staff the National Highway Traffic Safety Administration's Corvair defect investigation report. This study was conducted in response to a petition by Mr. Ralph Nader alleging that the Corvair contains structural defects which result in the vehicle flipping over. Some have called the NHTSA study a "whitewash"; others contend it is a sound technological analysis. Our goal is to review the contentions objectively.

Two witnesses this morning will be challenging the soundness of the NHTSA study. Mr. Ralph Nader, who is accompanied by Dr. Carl Nash and Mr. Clarence Ditlow, has conducted an analysis of the NHTSA study and is prepared to offer his views on it.

Mr. Harley Copp, the designer of the Ford Falcon, will also appear before the committee this morning regarding the Corvair report. Mr. Copp entered the Corvair controversy on his own initiative last year. He wrote to the chairman of this committee, Senator Magnuson, about Ford Motor Co. tests which were conducted in the early 1960's, comparing the handling characteristics of the Ford Falcon and the Corvair. During these tests several Corvairs flipped over unexpectedly.

Our first witness this morning is Mr. Donald Schaffer, who is vice president, secretary, and general counsel to the Allstate Insurance Co. I have asked Mr. Schaffer to appear before the committee to discuss the results of the Allstate airbag fleet test. Briefly, Allstate has acquired the first test fleet of production vehicles with factory equipped airbag systems in the front passenger position. As part of the fleet testing program, the company engaged the Dynamic Science Laboratories in Phoenix, Ariz., to conduct several performance tests on the vehicles. In view of the controversy over the airbag, I thought it would be important for us to review the Allstate testing program.

Mr. Schaffer, you may proceed.

STATEMENT OF DONALD L. SCHAFFER, VICE PRESIDENT, SECRETARY, AND GENERAL COUNSEL, ALLSTATE INSURANCE CO., ALLSTATE PLAZA, NORTHBROOK, ILL.

Mr. SCHAFFER. Mr. Chairman, we appreciate this request to appear and are happy to cooperate with the committee. Allstate is the second largest insurer of automobiles in the United States, and we have an obvious interest in anything that relates to vehicle and occupant safety.

In the complicated equation of the highway, vehicle and safety, there has been injected a new variable, that is the passive restraint or airbag system.

Airbags have fueled a whole new generation of debate. They have sent researchers back to the bookstacks, and into the laboratories, politicians to the podium, consumer advocates to the front page, and auto manufacturers into alternate states of depression, dementia, paranoia, and ecstasy—with a great deal of the first three sensations, and very little of the last.

As an insurance company, Allstate entered the "airbag" controversy with an obvious interest in and identity with any passive restraint system which had the potential to substantially reduce serious injuries and prevent deaths.

Occupant protection is but one aspect of highway safety, but the passenger packaging aspect of the crash phase is of great importance and reasonably quick payoff.

We also entered this controversy with a full appreciation of the need for reasonable cost benefit guidelines, but with an educated cynicism concerning some of the high cost claims being made and some of the engineering difficulties being alleged.

We were especially mindful of the hardships placed upon an innovator attempting to pioneer a specific safety feature. Without the requirement of mandatory installation through a Federal vehicle standard, the reverse competitive impact of additional cost and the difficulty of selling specific safety improvements creates a depressing environment for new safety items.

Attempts to sell safety may deter vehicle sales rather than increase them. Safety items hardly are consistent with marketing efforts for cars with names such as "Fury," and "Barracuda," "Firebird," and "Camaro," "Maverick," and "Mustang, and "Rebel," and "Javelin."

Where did we get our education on the reliability of cost-benefit arguments? When it became apparent that the alarming increase in property damage and collision insurance costs resulted in substantial part from changes in vehicle design which made automobiles subject to major damage in even the lowest speed collisions, we determined that survival of automobile insurance as a private business as well as the public interest required a change in automobile construction to lessen damageability and reduce repair costs. The first obvious step was bumpers of equal height which could take at least a minor bump without $300 damage to each car.

When we attempted to promote this idea—to suggest that maybe the bumper should not be recessed into the sheet metal, that perhaps they could be placed on energy-absorbing mounts, that perhaps some protective material could be placed on the face bar and that equal height requirements were needed we ran into the cost benefit boys.

They appeared in public forums to allege that 5 m.p.h. bumpers would protrude in the front and rear in such elephatine proportions that every garage and parking place would become obsolete, that cost per vehicle might run as high as $600 to $800, that their installation would so alter the crush characteristics of the car as to make them unsafe for human occupancy and the rebound characteristics were so great that the vehicle might depart the struck obstacle in the reverse direction at a speed greater than that of impact.

Now, some of those arguments obviously were greatly exaggerated and I think the coming generation of automobiles has proven they were incorrect.

So in approaching the air bag question, we bring a suspicious attitude to any cost-benefit arguments. We also found that air bags were such a rapidly developing technology that only those in almost daily contact with the newest equipment possessed meaningful information. The developmental costs were such that only a handful of companies were substantially involved—almost entirely auto manufacturers or some of their major suppliers.

Since it seems unlikely that a meaningful aftermarket or retrofit market will develop in the near future, almost the entire effort is aimed at original equipment—which means the auto manufacturers are the only present customer.

With millions invested in a developmental program, no major supplier is likely to speak publicly in a manner designed to alienate the sole customer. This environment left the auto manufacturers as the only business free to speak with seeming authority on the subject.

The only other spokesmen have been a few consumer representatives and the Department of Transportation. In this setting, we were shown impressive private demonstrations of new technology including reduced noise levels, protection for out of position occupants, aspirator systems and cluster bags, and optimistic private reports of reliability factors and injury severity control—while at the same time, reading in the public press, a coordinated and accelerating attack on the safety,

reliability, and performance characteristics of air bags and an even stronger attack on the cost-benefit relationship.

The media got only one side—supported with apparent facts—and their negative response to air bags reflected this slanted input.

At about this time the Insurance Institute for Highway Safety completed its study of observed seatbelt usage indicating that lap and shoulder belts are in fact used even less than previously thought.

The report demonstrated that lap belts were used by only 21.8 percent of surveyed occupants in major metropolitan areas, and only 7 percent in areas of less than 100,000 population. Shoulder belts were used by only 4.8 percent of the surveyed occupants in metropolitan areas, and 0.5 percent in other areas. This accentuated the need for passive restraints.

There has been launched, recently in Detroit, a belated campaign to promote lap and shoulder belts as the answer to the injury problem. It is said that the new interlock warning systems should be given a fair chance to operate, to increase usage and prove their worth. Lap and shoulder belts have a substantial value, but only when used. We certainly support their use and the use of appropriate interlock and warning devices to encourage this use.

However, we do not think the public should be misled concerning their effectiveness or their value as an alternative to passive restraints. The interlocking warning devices are required only for the lap belts in future regulations, not the shoulder belts.

So the injury reduction potential is limited to lap belt results, even if the devices are not circumvented. And there is some suspicion of hypocrisy in this promotion of warning devices, since a survey in March in Washington by the Insurance Institute for Highway Safety, of 11 new-car dealers showed that salesmen at nine of the 11 were willing to show how the warning devices can be either circumvented or disconnected.

In any event the devices are not required to promote use of the shoulder belt and with less than 5 percent usage of this device, the belt systems have no chance to compete with passive restraints (air bags) as an effective injury prevention and life saving device.

Having outlined some of the environment as we found it in the passive restraint area, what did we conclude should be our position?

Looking at the generally accepted seat occupancy rates in accident involved vehicles, it appeared that around 87 percent of such occupants are found in the front seat. It further appeared that 61 percent of the fatalities were front seat occupants of vehicles involved in frontal impacts of the type expected to trigger passive restraints with the present state of technological development.

This provided a large population of lives (several thousand annually, to be saved and disabling injuries (several hundred thousand) to be prevented through an effective passive restraint system in the front seat positions only. We concluded that the real payoff was in the front seat and the major expenditure of time and funds should be to develop effective systems for the front seating positions.

It was also apparent that presently available air bag systems were not effective in roll-overs, second impacts, nonfrontal impacts, and low-speed collisions, and for that reason, the lap belt should be retained and interlocked in a way that required its use in the front seat positions.

I would emphasize that we support at Allstate, retention of the lap belt with the early generation of air bags. In addition, it retains occupants in the most desirable position for advantageous deployment of the passive restraint system.

We were appreciative that in private sessions, a number of automobile manufacturers and air bag system manufacturers demonstrated the state of the art, and were reasonably candid in their comments. We concluded the major developmental problems had been solved for first generation installation, but for reasons I have indicated, none of the solvers would be quoted publicly, nor would they release their data for public use.

Thus there was no private agency freely available as a constituency to speak for and to the public in an authoritative manner, on the air-bag issue. In attempting to bring some of these points before the public, we have been forced to rely on data of the Federal Government and on quotations from Federal officials.

Unfortunately, this gives only a partial and not completely informative picture, but we still felt it necessary to undertake our limited efforts at public education because of the importance of the subject and the informational monopoly which existed.

The potential for saving lives and preventing disabling or disfiguring injuries is so great that mandatory front seat installation should proceed without unnecessary delay. When you buck up against the old "leadtime" problem (maybe 3 years) and add to that, the fact that only one-tenth of the cars are replaced each year—even if we start with the 1976 models, as presently required, this means 100 percent replacement will not occur until well into the 1980's.

With the demonstrated potential of air bags, in our opinion, anyone who fails to support the quickest development and installation of air bags, consistent with commonsense, technical development, and overall safety aims is on the wrong side of this issue.

If passive restraints are to be required, it is not too early for the automobile manufacturers to commence building up public confidence and acceptance of the air bag as an ultimate necessary and ordinary part of the crash-protection package delivered to their customers.

We believe in the reliability and safety of air bags, even in their present state of development. Since early March of this year, Allstate has been operating 200 Mercurys, factory-equipped with right-front-seat air bags. The Allstate Mercurys are production line models assembled and furnished to us by the Ford Motor Co.

The air bag units in these cars were supplied to Ford by the Eaton Corp. and Allied Chemical Corp. to the specifications of the Ford Motor Co. Eaton and Allied, two of the largest suppliers of automotive parts, have confidence in the reliability and safety of this equipment, as does the Ford Motor Co.

Allstate anticipates delivery this fall of a number of cars with air bags in both the driver and front passenger positions supplied by other manufacturers. And we anticipate favorable results from volunteering ourselves for these field tests, or we would not be doing it.

We wanted some independent verification of the reliability and performance characteristics of these air-bag-equipped cars were testing. We picked three of these Mercurys out of the fleet and sent them

to Dynamic Science Laboratories, the same organization doing the DOT tests for the experimental safety vehicles.

We did extreme rough road tests, panic stops, a ramp jump of some 45 feet at 45 miles an hour, and a 5 m.p.h. barrier impact—all of which demonstrated the reliability against inadvertent firing built into the air bag sensor systems in these cars.

We also did some noise level tests, and finally a barrier impact test at 17½ m.p.h., in which the front seat passenger air bag performed perfectly. That is equivalent of about a 35 m.p.h. impact into a parked car of equal size and mass. To our knowledge, this was the first test of a live volunteer in a production-built automobile with an air bag restraint system in an actual barrier crash—and also without any special padding, helmet, or protection; wearing only street clothes and the regular lap belt.

I am sure you will be extremely interested in the brief film footage we will show of some of these very gratifying tests.

With your permission, Mr. Chairman, we would like to show some segments from the test film at this time.

Senator HARTKE. That will be fine. We need the lights dimmed.

(Film.)

Senator HARTKE. What speed was that?

Mr. SCHAFFER. Seventeen and a half miles at the barrier.

(End of film.)

Mr. SCHAFFER. From that, Mr. Chairman, we made three 1-minute commercials that we intended to place on network television. If we could have those shown.

Senator HARTKE. I would like to have those run.

(Film.)

Senator HARTKE. We have a quorum light on. I do not intend to respond at this moment.

Mr. Schaffer, when are we going to see those commercials on television?

Mr. SCHAFFER. There is kind of a history and background to that.

We had approached the three TV networks with the concept we were going to run these tests and going to prepare some commercials from them. If I could speak to the three separately, perhaps, because they approached this problem separately.

CBS indicated that they were in the process of completely restructuring their acceptance procedure, but indicated they would probably refuse all commercials which did not relate directly to a product of the advertiser.

After the tests and commercials were completed, they were submitted to CBS and rejected on June 20, 1972, on the basis that air bags were not an Allstate product.

ABC initially indicated that air bags were controversial and they would not accept commercials relating to this subject. We asked ABC to reconsider this decision and after the tests and commercials were completed, we submitted the finished commercials to ABC and requested approval.

On June 5, 1972, ABC rejected the commercials on the basis that air bags are only one of many systems of passive restraints and are therefore considered controversial. We approached ABC again and they suggested some minor changes in the commercials, not really of sub-

stance. These changes were made and the commercials resubmitted to ABC on July 19, 1972, with a request for reconsideration. This is pending.

NBC was the only network which had indicated in our initial visit that they would run the commercials if the tests proved successful. They, of course, reserved the right to review the finished commercials after their completion.

After the commercials were prepared, they were sent to NBC and the first was scheduled for the May 28, 1972, "Meet the Press" program, which Allstate regularly sponsors.

Senator HARTKE. You sponsor the program, Meet the Press?

Mr. SCHAFFER. That is right.

Senator HARTKE. The commercials were to be on a public affairs program. Now you had a commercial paid for by Allstate which did not deal with selling insurance, but dealt with automobile safety?

Mr. SCHAFFER. Yes. We think that relates to insurance.

Senator HARTKE. It relates to insurance only incidentally.

Mr. SCHAFFER. That is correct.

Senator HARTKE. We saw the commercial, and it made no mention of insurance whatsoever, did it?

Mr. SCHAFFER. It did not relate to insurance as a product.

Senator HARTKE. As a product, is what I mean.

Senator COOK. When you say Allstate, you think about insurance, do you not?

Mr. SCHAFFER. We hope so, sir.

Senator COOK. All right.

Mr. SCHAFFER. We sent these and they were scheduled for May 28, on the Meet the Press program. On May 25, NBC contacted us to ask if we could supply standby commercials for "Meet the Press," since NBC was concerned over the publicity given to the so-called "Wayne State" air bag test failures which had been publicized that week.

I had appeared that week in Detroit on behalf of Allstate to deliver a paper on air bags at the Society of Automotive Engineers Conference on passive restraints. We had participated in a press conference in connection with the conference and had shown our test films and let it be known that we intended to use the test footage in television commercials.

I also disclosed that fact to the Society of Engineers group when I spoke to them. Professor Lawrence Patrick, of Wayne State University, also participated in the press conference, and put on an air bag demonstration in his laboratory. The device he had assembled failed to inflate and this got a great deal of publicity.

Senator COOK. May I halt here, just a minute.

Mr. SCHAFFER. Yes.

Senator COOK. When you say, the device he had assembled, you mean they did not use the ordinary air bags out of production as you used in your Mercurys?

Mr. SCHAFFER. No, they did not, sir. As the question from the press indicated subsequently, Professor Lawrence Patrick of Wayne State was putting on this demonstration as part of this conference, and he said later, that he had taken some parts he had in the laboratory which were between 18 months and 2 years old. They were left over

from another demonstration. They were not parts designed for highway use but were designed for laboratory experiment.

They had since been declared obsolete by the manufacturer. His graduate students assembled the parts the night before. He also responded in answer to questions from the press, that he had made no check of the circuitry, because he did not have the proper type of equipment there to check it. It turned out there was a piece of solder left on this old equipment on a subsequent review, and if he had had a circuit checker, the most elementary check would have told him that air bag was not going to fire when this car in the lab was on the track and the chassis hit this rebound spring.

So that from our concept, that was an irrelevant demonstration. It had no more relevance than if my son was getting old parts and building an automobile engine in the garage and it would not start. And after that, somebody said, automobile engines are not reliable, they will never work, they should not be allowed on the highway.

There was just that much relevance. The Mercurys—which would be required on every production car ever built with an air bag in it—has a built-in circuit tester with a red light, it says "Passive Restraint." You start the engine, that red light lights, and there is a complete check of the circuitry, and the air bag, and the light goes out in about 3 or 4 seconds.

If the light stays on, you then know the air bag probably would not fire in a crash. That does not mean it is dangerous or that it might accidentally inflate. It just means in a crash it would not work and you should get it checked. There is a built-in circuit checker in those. I might say the other publicized failure has been Fairchild Hiller.

In that particular case, I think the wires were reversed in the crash sensor on the bumper. The Fairchild Hiller automobile had an extended bumper designed for the particular experimental safety vehicle.

The bumper was designed to extend out further and further as the speed increased and is for use with the present generation of automobiles such as our Mercurys. It was incorrectly wired. But even the most elementary circuit check there, I think, would have disclosed that the device was not going to fire.

We do not see the relevance of these two experimental vehicles—the relevance of those two cars, to our production Mercurys, built by Ford Motor Co., equipped and checked by them, with units furnished by Eaton and Allied, which have done the most research on air bags of anyone.

Senator HARTKE. Now, in regard to the Wayne State and Fairchild Hiller, did you participate?

Mr. SCHAFFER. We were not a sponsor. We happened to be present at the Wayne State demonstration.

Senator HARTKE. You were present but did not participate in the development or the testing, itself?

Mr. SCHAFFER. We did not.

Senator HARTKE. How many Mercurys have you been testing?

Mr. SCHAFFER. We started with 200 and we have 197, because we crashed three of them. The particular car that you saw off the ramp sustained about $1,800 damage, and it was determined probably should not be repaired. But it, of course, performed very well after it hit, after that impact. You would not expect a car to sustain that type of

impact though. The car that went into the barrier sustained about $2,000 damage.

Senator HARTKE. Was there any television coverage of the Wayne State failure?

Mr. SCHAFFER. I am afraid there was and I am afraid failures get a lot more publicity, relevant or not, than successes do. I guess that is human nature.

Senator HARTKE. Was there at that time any statement made that this was a controversial item?

Mr. SCHAFFER. I do not know that it was.

Senator HARTKE. It was not held off the air because it was controversial?

Mr. SCHAFFER. It was not held off the news programs, sir.

Senator HARTKE. It was on the news programs, rather than on a commercial. As a member of the Communications Subcommittee, and although the fairness doctrine was part of the law prior to 1960, I was the author of that provision which now contains the fairness doctrine. I can tell you it was not intended that the FCC or the networkers interpret it this way.

Mr. SCHAFFER. When informed of the NBC action, I called NBC and informed them of the facts concerning the Wayne State failure and followed this up with a letter. They said they would pull the commercials until they could reconsider the matter.

On June 21, NBC formally rejected the commercials on the grounds that air bags were a controversial subject.

We then contacted NBC to say we could not accept this rejection and requested a meeting with their top management. On July 12, myself, our marketing vice president, and the vice president of our advertising agency went to New York and met with the president of NBC–TV network, the network general counsel, and the vice president in charge of broadcast standards. An extensive and somewhat heated discussion failed to cause them to reconsider.

The NBC people relied upon controversiality and an FCC release of January 11, 1972, in connection with a Ford Motor Co. commercial on air bags. The Commission counsel had ruled on the facts in that case that air bags were controversial but that the Center for Automotive Safety was not entitled to respond to the Ford commercial because the fairness doctrine had not been violated since television had given fair and balanced treatment to the air bag matter.

We felt that NBC misinterpreted the FCC opinion, that we answered every question they raised and that they failed to satisfactorily answer many questions we raised. We do not believe the FCC ever intended to authorize or permit any television network or station to arbitrarily prohibit informative and factual television commercials on air bags, a device endorsed by the DOT and as a matter of Federal regulations to be required on future model automobiles.

The fact that some automobile manufacturers may oppose these Federal regulations does not mean that the airways should be denied to responsible persons of contrary views.

There have been two recent highly publicized so-called air bag test failures, the one being the Wayne State episode to which I referred and the other failure was that of the Fairchild Hiller experimental safety vehicle in crash tests for the Department of Transportation.

The lack of relevance of those test results to the safety, reliability, and performance characteristics of our Mercury air bag units is a fact that certainly should be pointed out to the public.

Let us take the Wayne State failure first. This was a laboratory demonstration put on by a college professor, who, with his graduate students, assembled, the night before; a demonstration unit from some parts which he had in his laboratory. After the failure, the professor admitted these parts were over 2 years old, and were experimental designs.

The designs were as out of date in relation to the air bag units on the Allstate cars, as our first space rockets are to our current Appollo space equipment.

Routine pretesting would have indicated that the system was not properly operative (the Allstate units, as is the case with all modern air bag units for highway use, have a built-in circuit tester with an automatic warning light).

To compare the professor's unit to a modern system, supplied by a reputable company, and installed and checked by the Ford Motor Co. for highway use, to exacting standards of reliability, is obviously inappropriate. This is like saying because an amateur assembled an automobile engine in his garage from old and obsolete parts and it failed to start, that automobile engines are unworkable and should never be allowed on the highway.

Next, let us look at the so-called DOT failure. This was a Fairchild-Hiller experimental car with a safety bumper designed to extend out as far as 30 inches when the car picked up speed. Because of this extended bumper, the regular type sensor such as is used in our Mercurys and has been subject to such wide-scale testing, is not appropriate and it was necessary to use a new type "crush" sensor, installed in the bumper itself.

Thus the sensor system was totally different from the proven reliable system in our Mercurys of the type being installed in the current generation of automobiles. Even then it failed to inflate in the crash only because the wires had been improperly connected to the sensor.

Thus the DOT test was of an experimental vehicle with an experimental sensor system unrelated to the type of system ready and available for highway use today.

We are convinced that the installation of air bags is not being delayed because the technology is not ready, or because the cost outweighs the benefits. Rather their installation is resisted for politico-economic and philosophic reasons unrelated to their technical merits or their ability to save lives and prevent injuries.

It is easy for an opponent of air bags to raise questions and doubts, to scare the public, to bluesky the costs, to get the hot-rodders and other free spirits, outraged.

A proponent is severely limited in the resources available. We have attempted to demonstrate our faith in the most effective way we knew how—by using ourselves as confident guinea pigs.

So we find ourselves in the position of being strong believers that the public interest requires early development and installation of air bags in the front seat positions, of having pioneered the first test fleet, using such a system in the passenger position, of having run successful road and crash tests with these first, production-line units, of

having filmed these tests and produced informative commercials therefrom, of having been willing to pay to give the public the opportunity to view these demonstrations, and of being denied access to the television networks for these purposes.

We cannot believe it is appropriate policy with the quality of the commercial messages seen daily on television that worthwhile tests such as the ones we have conducted, cannot properly get an appropriate place in the schedule of messages transmitted to the American public.

Senator, I am glad to hear you say that because as strongly and heatedly as I could say it, I said the same thing to NBC, ABC, and CBS, without any results up to this date.

With NBC we furnished the data that distinguished the failure and the Fairchild-Hiller failure, as I have outlined it here; we did not consider them relevant, they did not affect our tests. We then requested these commercials be run on NBC as they had indicated they would originally. They then wrote us a letter and said these were controversial. Air bags were controversial.

We said we could not accept that decision, and asked for a meeting with their top management. I went with our marketing vice president, the vice president of our advertising agency, met with the president of the NBC–TV network, the network general counsel, head of the broadcast standards division, the vice president in charge of that.

We spent about 2 hours in a rather extended debate over the fairness doctrine and network policies and what the public was entitled to see, and the importance of air bags, and that in our opinion, we were dealing with lives and injuries, and this was too important a subject for us to fold up on; and just tuck these commercials away.

So at the conclusion of that time, they said that the fairness doctrines, the FCC decision in particular, in January of 1972, that related to some 1970 commercials Ford Motor Co. ran, which included statements about air bags, that the fairness doctrine applied under that decision to air bags.

We responded that that decision did say air bags were controversial. They may have been so at that time, but we did not think our treatment of air bags was controversial and a lot of water had gone under the dam technologically since the original Ford commercials, and at that time in relation to the FCC decision, FCC said there had been a balanced presentation and there was no right to respond to the Ford commercials under the fairness doctrine.

Our position was that this situation had since become unbalanced. The Fairchild-Hiller and Wayne State items had been reported and all we wanted to do was balance it with some positive scientific test data reports woven into our commercials.

They (NBC) said they didn't think they could accept them under the FCC doctrine.

Senator HARTKE. Was there any contention by the networks that part of your testing program was not in accordance with scientific procedures?

Mr. SCHAFFER. No, no one has ever alleged that. Perhaps someone will in the future. But when I presented these same films that the committee saw, I presented them to the Society of Automotive Engineers in a meeting on passive restraints and nobody contested the procedures at that time as far as I know.

I don't mean that everybody by their silence accepted them.

Senator HARTKE. They said that the subject was controversial, not the commercial itself?

Mr. SCHAFFER. Well, we'll furnish the letter they wrote to us.

Senator HARTKE. Please, and I also will direct the staff at this time to contact the FCC specifically on these questions. I would like to have them here in person as soon as the moratorium on hearings is either over or we can have other hearings.

Mr. SCHAFFER. I might just add one thing, and that is that with NBC, of course, we said we don't think we have treated—if the total subject of air bags is controversial, we don't think our particular treatment of it is, and they responded, well, the whole subject of safety is controversial. And we said, the whole subject of automobiles is controversial. If you're going to run Aldrin for General Motors and have him point out the side-guard rails and windshields, we ought to put air bags as a better solution on, without paying for them, if that is really what the fairness doctrine means. We don't think that's what it means.

We also said to them that we thought this subject was so important, that if there was a valid invocation of the fairness doctrine—and if they had to put someone on for some balanced response, if that required them to lose any commercial time, would they consider letting us reimburse them for it; and they said they could not accept that offer.

Senator HARTKE. Your position was that you were willing to provide both this commercial and provide for paid time if there was to be a request for equal time?

Mr. SCHAFFER. We are not, of course, an eleemosynary institution, and what we said was, if—we expected them to resist any ridiculous requests or resist requests from irresponsible people or from people who did not have facts to present.

Senator HARTKE. I understand.

Mr. SCHAFFER. But if there were really facts to present, and the fairness doctrine was properly invoked, that we would be willing to consider seeing that the network didn't lose anything by that.

Senator HARTKE. Since 1966, I have been deeply involved with this highway safety system. My sister was killed in 1964. If the car had been equipped with an air bag, it might have saved her life.

What you are saying is that the lap belt must be used in conjunction with the air bag; is that correct?

Mr. SCHAFFER. We think that is important in the first generation of air bags. Now, other people—the air bag will work whether you have the lap belt or not.

Senator HARTKE. I understand that the purpose of the lap belt is to keep the person in position to receive the full benefit of the air bag?

Mr. SCHAFFER. And to operate in situations where the air bag will not inflate. It is about 61 percent of serious injuries that the air bag will operate in.

Senator HARTKE. Yes. It is not to be a complete removal of all injuries, but one item in the field of safety.

Mr. SCHAFFER. It certainly is. We have worked on other items and this is just one, but we think it is a very important one. The public hasn't received any real data or information on it.

Senator HARTKE. The real purpose of the electronic media certainly is to provide a forum for exchange of views, of opinions, facts, new ideas and new technology. Certainly it ought to be willing to display methods of safety for the 57,000 that are going to die in automobile accidents this year.

If you instituted the system on new automobiles immediately, how soon could we have a complete coverage of practically all the automobiles on the highway?

Mr. SCHAFFER. If the 1976 model year remains the standard for installation, and if, as we have suggested, it will be limited to front seat even though presently they are talking about rear seat also, we think it would perhaps expedite further nondelay if we could limit this to the front seat where the big payoff is.

Then you are talking about 10 years thereafter, from the 1976 model year, to replace substantially all the cars on the highway, passenger cars that would be required to have passive restraints. So you are into the mid-eighties. You are in the mid-eighties to really accomplish a large amount with air bags, even though each year you are talking about several thousand deaths and perhaps several hundred thousand serious injuries. The installation, of course—we just don't think because some of the manufacturers might object to this time schedule, that we ought to be denied access to the airways of America with factual commercials.

Senator HARTKE. I have heard there is an advertisement for one of the automobiles about an exceptionally large glove compartment this year.

Mr. SCHAFFER. I read that in the Wall Street Journal, the statement that was in there. I can't say whether it is correct or not. But the story was that that was intended for the air bag to go in if they were required to put them in in this particular model year, and they have now converted that to a very large glove compartment. Now, whether that is a fact or not, I don't know, but that was in the Wall Street Journal a couple of days ago.

Senator HARTKE. Let me cover this question now of the balance. Your feeling is that the information and the coverage given to the Wayne State and Fairchild-Hiller failures is unfair. Thus the impression left with the general public is that air bags are unsafe. Your commercials would be putting it back into balance as to the fact that there is another view which says that air bags are safe.

Mr. SCHAFFER. I think that is perhaps our second position, that we think our commercials are factual in that regard. They result from test procedures. We would think first that the particular treatment we give to these, of the tests and the production line cars, are not controversial because there are no facts to the contrary on this type of device or to these particular vehicles. So I don't think anybody has any tests that show that these ever failed or would not perform as they were supposed to.

Second, we think there is an imbalance on the general subject of air bags, and this would tend to redress it. I would like to point out that both the Wayne State and the Fairchild-Hiller so-called failures in both instances, they were not cases where the air bag went off accidentally or inadvertently.

We think that is almost impossible to happen. But there were cases where in a crash the air bag didn't work, so at least you weren't any worse off with the air bag than you would have been without it in that type crash.

Senator HARTKE. It is just that it didn't work?

Mr. SCHAFFER. It didn't go off in the crash but it didn't go off inadvertently, and cause a crash or anything like that.

Senator HARTKE. I just want to cover one part of your statement and the rest of it can be inserted in the record.

In this report on the Wayne State situation, the final assembly of the unit used was done the night before; is that correct?

Mr. SCHAFFER. That is my understanding. They expected a different unit and did not get it.

Senator HARTKE. They expected a different unit and did not get it. The final assembly was put together by the professor and his students the night before.

Mr. SCHAFFER. There is a report of an investigator from the National Vehicle Safety Advisory Committee which was sponsoring this press conference. I will be happy to furnish that.

There is also a report from people from the Eaton Corp. who had requested that various people go in and look at this thing and report on it, plus the fact that the professor (Prof. Patrick V. Proley) answered the question of the press honestly at the time. This didn't get a full report perhaps in the press, but he answered all these questions frankly, and he had the best intentions and I am sure he feels worse about this failure than anyone.

Senator HARTKE. You didn't want to put yourself on display and then not have the work.

Mr. SCHAFFER. That's correct. This was not intended to demonstrate the present art of air bags, but how they work in a laboratory situation with the particular devices he had.

Senator HARTKE. At this time we will include in the record those reports to which you refer, the document of June 2, 1972, the document from the Center for Automobile Safety on the report of the air bag test failures at the Wayne State Biomechanics Laboratory, and the letter to the Secretary of Transportation, Mr. Volpe, dated June 29, from Mr. Judson Branch, chairman of the National Traffic Safety Advisory Council.

Those will be included in the record.

(The following information was subsequently received for the record:)

NATIONAL BROADCASTING CO., INC.,
New York, N.Y., June 21, 1972.

Mr. RICHARD L. CULLEN,
Leo Burnett Co., Inc.,
Prudential Plaza, Chicago, Ill.

DEAR DICK: As we promised during our recent meetings we have again reviewed the matter of "air bag" controversiality. Our review has reinforced our conclusion that this subject has once more become controversial.

I am sure you will recall that on April 13, 1972 members of my staff and of the NBC Law Department discussed with you, Mike Breslin and Don Schaeffer the nature of the "air bag" situation as it then appeared. We recognized at that time that the "air bag" question might have been controversial (and was so held by the FCC, Broadcast Action Report No. 10384, January 11, 1972), but the staff tentatively accepted your position that the "air bag" question had, thereafter, within a relatively short period of time, become essentially non-controversial.

I understand that you were also advised (as we routinely advise all clients where we feel there is any fairness obligation risk) that a matter such as this could become highly controversial overnight and that, if this should happen, we might, in view of our overall broadcast obligations, be compelled to withdraw approval. It is simply unfortunate that we cannot predict the actual events or the actions of people that can create public controversy where none appeared previously to exist.

Among the indicia of present public "air bag" controversy are the highly publicized test failures of "air bags", public statements by the AAA and other automobile groups strongly opposing present installation of "air bags", and your own brochure (published, I understand, since the April 13 meeting) which refers to the "Air Bag Controversy." You will understand, of course, that the question of public controversy does not turn on the truth or falsity of the views expressed but upon the existence of public views which controvert them, no matter how lacking in actual merit the controverting views may be.

As we mentioned previously, we feel that subject matter which may tend to involve issues of public controversy is more adequately and more properly treated in news and public affairs programming that in the sale of commercial time. Among other considerations, a policy of unrestricted sale of time for discussion of controversial public issues would undoubtedly tend to the advantage of those parties most able to pay without regard to the merits of the issues.

The risk we mentioned that "air bags" could again become controversial has now apparently become a reality with attendant Fairness Doctrine implications. As we advised previously, we are not prepared to accept for broadcast at this time your "air bags" commercials.

Sincerely,

H. TRAVIESAS.

EATON CORP.,
SAFETY SYSTEMS DIVISION,
Troy Mich., July 2, 1972.

Mr. JUDSON B. BRANCH,
Chairman, National Motor Vehicle Safety Advisory Council, U.S. Department of Transportation, Washington, D.C.

DEAR MR. BRANCH: The demonstration of a Wayne State air bag system sponsored by the National Motor Vehicle Safety Advisory Council last May 23 received so much notoriety in the press, particularly here in Detroit, that it could have a very far reaching effect on the main current of air bag development. We therefore believe that this test should be put in its proper perspective compared to the mainstream of air bag work at the automobile manufacturing companies.

The event was given an aura of currency and importance because it was done under the auspices of the council and in front of a wide range of press representatives. We would like to submit our chronological record of our observations of this unfortunate event.

On Thursday, May 18, we were contacted by Professor Lawrence Patrick, who is a member of your council, requesting our air bag display unit to be used at the above mentioned press conference which was to take place on the following Monday. We declined the invitation based on short notice and corporate policy. We asked what the substance of the program would be and it was explained that you would make some preliminary remarks, the Allstate movie of the Arizona air bag tests would be shown, and Wayne State would conduct a sled test with an air bag system. We were told by Wayne State personnel that Wayne State was going to use a Volkswagen vehicle outfitted with an American Safety experimental after-market air bag system, which we understand is being developed by Wayne State under a contract with American Safety. We were not asked to participate in any way in this test.

Eaton Corporation personnel were subsequently invited to attend this press conference through the Allstate representatives because of our participation in their tests of Eaton air bag equipped Ford vehicles in Arizona.

The press conference originally scheduled for Monday, May 22, was postponed to Tuesday, May 23, at 10:00 A.M. At approximately 9:45 A.M. on Tuesday, May 23, the Eaton Corporation personnel arrived at the Bichemical Lab at Wayne State University, the site of the press conference. We noted that the Volkswagen test vehicle was stationed at one end of the sled test track and that a Chevrolet test vehicle was at the other end of the track. We were perplexed and inquired

whether Wayne State intended to run a car-to-car crash demonstration. It was explained by Wayne State personnel that this was not the case but that test runs in preparation for the news conference on the Volkswagen had encountered considerable difficulty and they therefore scrubbed the Volkswagen vehicle test on Monday night. In order to fulfill their commitment to the council, Wayne State decided to substitute a Chevrolet vehicle. We understand that this substitution was made hurriedly in order to be ready for the 10:00 A.M. press conference. Further inquiry of the Wayne State representative revealed that they had elected to use an obsolete Freon gas generator manufactured by Rocket Research Corporation which they had on hand as left-over elements of a contract they had with the D.O.T.

These generators were sold to Wayne State University by Eaton Corporation under a purchase order dated September 14, 1970. The rapid advance of gas generator technology quickly obsoleted this design more than a year ago and no such systems have been supplied for automotive manufacturer activity. These units were supplied with specific instructions on their use. We can supply a copy of these restrictions if requested. The most important restriction was the fact that the inflators were experimental and they were carefully labeled: "avoid inhalation of the exhaust products." These reservations on the use of these units were based on the discovery by Eaton that Freon could be a highly toxic substance under certain conditions. Since this was only a test device, Rocket Research Corporation never pursued the complete validation of this unit. On February 19, 1971, we initiated an internal policy stating that no further units of this design would be sold except to support prior contracts or purchase orders and where they would be used under very restricted circumstances.

Eaton personnel indicated to the Wayne State representative that we were extremely apprehensive with respect to the results we might get from such a system and reminded him that this was designed by Rocket Research Corporation as an experimental workhorse system and was only one design in a multiple path development program.

We further indicated to Wayne State that had we known of the change in plans for the test that morning, we would have supplied them with a current, up-to-date solid-solid gas generator steering wheel system representative of current technology and current OEM activity. We determined further from the Wayne State representative that no check of the gas generator system had been made prior to installation in the vehicle they were to run that morning for the press conference demonstration. Eaton would be glad to supply the council with our normal sled test procedures.

There was considerable discussion among Eaton personnel as to whether we should make a formal request that the test be aborted on the basis of the information we had gathered on this last-minute test structure. However, since we were not officially part of this, we did not do so but our sentiments were made known prior to the test to a member of the council and to Wayne State representatives.

Immediately after the test failure, the press asked numerous questions concerning the demonstration. The Wayne State representative explained that it was a human error in the wiring of the system and took responsibility for the failure. Dr. Henry Hill, a member of the council, indicated that in his view this represented "state-of-the-art hardware." Dr. George Sutherland of Rocket Research Corporation, also a member of the council, refuted this statement saying that this system was not state-of-the-art. We heartily agree with Dr. Sutherland. Dr. Hill then agreed that it perhaps was not representative of state-of-the-art hardware. Subsequent questioning by a member of the press brought out that the design was at least 18 months old.

It is incredible that a test run under highly questionable conditions and employing obsolete, experimental hardware never used by any car company can cast such a shadow over the excellent results achieved by the Ford Motor Company and demonstrated in the tests conducted by Allstate with Ford vehicles.

The Allstate tests *are* representative of the results attained from a *true* state-of-the-art system designed and meticuously qualified to a rigid specification in a production vehicle, assembled and installed on a production assembly line and placed in the hands of fleet operators for field trial. The contrast between the literally thousands of tests of this production system and components to qualify on a Ford vehicle and this single episode is ludicrous.

In view of the fact that a system supplied by us at some time in the past was used in this test, even though it was without our knowledge and consent, we were invited to attend a meeting at approximately 11:30 A.M. on May 24

to ascertain the cause of the failure at the Wayne State laboratory. Attached is out technical report of this meeting.

We brought with us to this meeting a special milliohmeter which is required equipment to test the readiness of a system prior to a deployment. Wayne State does not have this equipment. We, of course, could have made it available to Wayne State prior to the test had they asked. We think it is interesting to note that every 1972 Ford production automobile with an air bag system has a readiness indicator circuit. One of the functions of this production readiness indicator circuit is identical with the equipment which we took to Wayne State to check their installation.

We believe that the council has a responsibility to properly present the true state-of-the-art air bag development to the media and to the public.

In view of the fact that air bag failures are prominently reported by the media, we think it only fair that air bag successes such as the Ford Motor Company 1972 Mercury program and the Allstate test program be given equal attention.

Very truly yours,

W. R. RYBURN, *Marketing Manager.*

(Attachment to Judson B. Branch letter, N.M.V.S.A.C. June 2, 1972)

WAYNE STATE UNIVERSITY STEERING WHEEL SYSTEM DEMONSTRATION

The following is a summary of Eaton Corporation involvement in the investigation of the steering wheel system unit which was used in the demonstration at Wayne State University on May 23, 1972.

The investigating committee gathered approximately 11:30 A.M. on May 24. Three pieces of hardware were exhibited:

Item A.—The 18-barrel gas generator and cushion assembly which had been removed from the sled the previous day (R.R.C. S/N 055).

Item B.—An unused 18-barrel gas generator and cushion assembly.

Item C.—A previously fired 18-barrel gas generator which was intentionally shorted with solder by a Wayne State University technician.

The committee inspected the circuit board portion of the three units with a magnifying glass (the solder shorts were readily visible on Items A and C).

R. Gehrig (Eaton) at the request of Prof. L. Patrick made resistance measurements of the three units using our Model 4328A Hewitt-Packard milliohmeter and contained the following results:

Item A.—(the misfired unit) 0.014 ohms

Item B.—(the unused unit) 0.083 ohms

Item C.—(intentionally shorted unit) 0.016 ohms

(Specification: 0.076 to 0.098 ohms)

Professor Patrick then proceeded to cut away the solder shunt on the circuit board *of the misfired unit* with a pocket knife, and after a visual inspection by everyone, R. Gehrig (Eaton) again measured the resistance which was 0.086 ohms.

Wayne State technicians then installed the system in the Chevrolet buck on the WHAM–III sled. R. Gehrig (Eaton) measured the resistance again and it had not changed. The final electrical connections to the sensor and power supply were made by Wayne State technicians and the sled was fired at 30 mph (no dummy was used).

The system deployed properly and observation of the firing which took place about 12:30 P.M. a cursory examination of the data traces appeared normal.

R. G. GEHRIG, *Eaton Corp.*

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL MOTOR VEHICLE SAFETY ADVISORY COUNCIL,
Washington, D.C.

REPORT ON FAILURE OF PASSIVE RESTRAINT SYSTEM DURING NATIONAL MOTOR VEHICLE SAFETY ADVISORY COUNCIL DEMONSTRATION, BIOMECHANICS LAB, WAYNE STATE UNIVERSITY, DETROIT, MICH., ON MAY 23, 1972

At the special meeting of National Motor Vehicle Safety Advisory Council members, at noon on May 23, 1972, at the Sheraton Cadillac Hotel in Detroit, Michigan, chaired by Vice Chairman Trevor Jones, the writer was asked to investigate the cause of the failure of the passive restraint system used in the demonstration at Wayne State University earlier that same day.

The writer returned to Wayne State University in the early afternoon of the same day and watched Dr. Lawrence Patrick and his staff make a number of electrical tests on the activator for the air bag. The system had been supplied approximately two years earlier by the Eaton Corporation according to Wayne specifications. Eaton secured the activator from Rocket Research. The latter consisted of eighteen detonating-gas generating units arranged in a circle and mounted on a disc type base plate. The detonators were connected in parallel through bus bars on the lower surface of the base plate. The particular activator was one of the first hundred such units made by Rocket Research.

After the failure of the unit to activate during the demonstration, an attempt was made to fire it by applying voltage directly to the terminals of the activating unit but without success. Electrical tests in the afternoon demonstrated that the terminal voltage and current through the unit were adequate to have fired it. The resistance of the unit was about 14 milliohms compared to about 83 milliohms registered by a spare unit. This indicated a short circuit so the unit was disassembled.

Inspection showed a small bridge of solder across the bus bars; thus preventing current from going through the detonators.

Dr. Patrick expressed a desire not to remove this shorting bridge unit until he could show the defect to representatives of Rocket Research and the Eaton Corporation. This was done the following day. The bridge was then removed, and the resistance of the unit increased to about 85 milliohms. It was later successfully fired by repeating the full sled test which simulated a crash at 30 mph. Council members John States and Ivan Wagar represented the writer on the latter occasion during which the air bag was successfully fired.

CONCLUSION

The failure of the demonstration was caused by a short circuit in the detonator activator unit which defect probably occurred at the time of fabrication. It was the type of defect which could have been detected by simple quality control procedures during manufacturing or assembly or by suitable tests prior to use. Unfortunately the type of tests necessary to detect short circuit in squib or detonator units requires a special current-limiting ohm-meter (otherwise the checking process might fire the unit). The Wayne State University BioMechanics Lab did not possess such an ohm-meter, and it was for this reason that such a short circuit test was not conducted. Wayne State University did make a circuit continuity test however, which was satisfactory.

In the writer's judgment, this type of failure would have been extremely unlikely in a production-type unit where reasonable quality control procedures were in effect.

Submitted by Dr. Allen V. Astin, May 31, 1972.

Mr. SCHAFFER. If you would like we can also include the storyboards of these particular commercials.

Senator HARTKE. We have a copy of those. Is this the same thing?

Senator Cook, do you have any questions?

Senator COOK. Mr. Chairman, I have a lot of questions, and I have been tremendously enlightened.

But the Sergeant at Arms has said we better get over and answer that quorum call, and I am wondering whether we should or whether we still insist that we continue.

Senator HARTKE. We will recess and go. We will be back as soon as we answer the quorum call.

(Recess.)

Senator HARTKE. The committee will reconvene.

Off the record.

(Discussion off the record.)

Senator HARTKE. Now, we will proceed back to these things on a more serious note.

Senator Cook, the floor is yours.

Senator Cook. Mr. Schaffer, your remarks and the tests that we have seen have been tremendously enlightening to me, and I don't want to either ruffle your feathers or the chairman's, but I would hope that these oversight hearings into the act itself, we don't get into a basic argument whether NBC or CBS are on trial here. As I view this thing, very frankly, either the media was allowed access to the Phoenix tests and Wayne State or the films were made available to the news media. I assume from these films, the media was not invited to attend the tests that Allstate put on, and obviously the films were not made available, because it was the aspiration of Allstate to use these films for advertising purposes.

So I think there is a difference, and I think what we have to get down to is not a battle between the chairman and the three networks, and obviously Allstate and the three networks, because I assume you are a pretty good customer of the three networks, but the feasibility of air bags as a passive restraint in automobiles.

Now, if it is the determination of this committee that under Motor Vehicle Safety Standard 208, that we ought to move up from 1976 models, and move it up to a more logical date, if that is the determination of the chairman, and that is the basis of the testimony, then this is something that we in Congress can do. But I would say to you, these are oversight hearings on the act itself, and I hope we don't go way out on a limb and decide we are going to get ABC and NBC and CBS in here and talk to them about the fairness doctrine.

Senator Hartke. May I interrupt a moment? Will the Senator yield?

Senator Cook. Yes; I will. I was awfully patient for a long time, but I will yield. Go right ahead.

Senator Hartke. I think the networks do owe an explanation quite honestly.

Senator Cook. Well, may I say——

Senator Hartke. Just a minute. Something is wrong when you cannot have an item of safety displayed even under a paid basis. I am primarily concerned with saving people's lives, and in the event that the media is going to become a censor on availability of life saving devices, we have come toward something the American people would not generally feel was right. If it is the FCC's fault, that is one thing, but if the networks are involved, it is another. Somebody definitely has made a horrible mistake and I am shocked, I don't mind telling you.

Thank you.

Senator Cook. No, Mr. Chairman, I don't have any more questions. Go right ahead.

Senator Hartke. You don't have any more questions?

Senator Cook. Right.

Senator Hartke. All right, thank you. Those are all the questions I have.

Under the Automobile Safety Act there is a consumer information section which is designed to inform consumers. The fairness doctrine must not interfere with that information.

That is all the questions I have of Mr. Schaffer.

(The following information was subsequently received for the record:)

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C., August 9, 1972.

HON. DEAN BIRCH,
Chairman, Federal Communications Commission,
Washington, D.C.

DEAR MR. CHAIRMAN: At hearings before the Senate Commerce Committee on July 25, 1972, Mr. Donald Schaffer, representing the Allstate Insurance Company testified regarding Allstate's attempt to purchase commercial television time to broadcast several pro-airbag commercials. The commercials were compiled as a result of a series of tests that Allstate had performed by an independent testing laboratory in Arizona on the reliability of the airbags installed in an Allstate fleet of vehicles. According to Mr. Schaffer, none of the networks to date have agreed to sell Allstate broadcast time to air the commercial messages.

As a result of a decision by Mr. William B. Ray, Chief, Complaints and Compliance Division, the issue of airbags is considered to be a "controversial" one. Accordingly, a balanced presentation of contrasting points of view is required under the "Fairness Doctrine." Several issues of that decision were appealed to the Court of Appeals of the District of Columbia. In brief, the court concluded that:

"We hold specifically that a flat ban on paid public issue announcements is in violation of the First Amendment, at least when other sorts of paid announcements are accepted. We do not hold, however, that the planned announcements of the petitioner—or, for that matter, of any other particular applicant for air time—must necessarily be accepted by broadcast licensees. Rather, we confine ourselves to invalidating the flat ban alone, leaving it up to the licensees and the Commission to develop and administer reasonable procedures and regulations determining which and how many 'editorial advertisements' will be put on the air."

The decision of the Circuit Court was appealed to the United States Supreme Court and the appeal was subsequently accepted.

Apparently, the determination by Mr. Ray that airbags are a controversial issue was unaffected by the Court's decision. The inability of Allstate to purchase broadcast time for pro-airbag commercials raises additional issues concerning the "Fairness Doctrine:"

1. If the airbag units installed in the Allstate vehicles were reliable, and the commercials only discussed the test results, would this still constitute a "controversial" ad?
2. If the issue itself of airbags is controversial, is the issue of automobile safety in general controversial?
3. Does widespread exposure on news programs of the failure of airbag tests and an adverse statement by Henry Ford regarding the airbag on the *Today Show* (May 31, 1972) mean that a new balance must be struck by accepting Allstate's paid ads?

Sincerely yours,

VANCE HARTKE,
Chairman, Transportation Subcommittee.

FEDERAL COMMUNICATIONS COMMISSION,
Washington, D.C., August 30, 1972.

HON. VANCE HARTKE,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HARTKE: This is in reply to your letter of August 9, 1972 concerning air bag commercials.

As you have indicated, the Broadcast Bureau in a recent case *The Center for Auto Safety*, 32 FCC 2d 926 (1972) held that the subject of air bags was a controversial issue of public importance at the time the commercials, which were the subject of that complaint, were aired. That case was not appealed. In an unrelated case, the Commission in the *Letter of Business Executives' Move for Vietnam Peace*, 25 FCC 2d 242 (1970), held that stations were not obligated to sell time to the group Business Executives Move for Vietnam Peace (BEM) to present paid commercial announcements against the United States' policy in Vietnam. That decision was appealed and the Court of Appeals reversed the Commission's

ruling in *Business Executives' Move for Vietnam Peace* v. *F.C.C.*, — U.S. App. D.C. —, 450 F. 2d 642 (1971) and held that:

> . . . a flat ban on paid public issue announcements is in violation of the First Amendment, at least when other sorts of paid announcements are accepted. We do not hold, however, that the planned announcements of the petitioners—or, for that matter, of any other particular applicant for air time must necessarily be accepted by broadcast licensees. Rather, we confine ourselves to invalidating the flat ban alone, leaving it up to the licensees and the Commission to develop and administer reasonable procedures and regulations determining which and how many "editorial advertisements" will be put on the air.

The court also ordered the Commission to develop reasonable guidelines to aid broadcasters in determining whether to accept editorial advertisements.

The Commission asked the Court of Appeals for a rehearing and stay of the mandate. That request was refused by the Court of Appeals. The Commission then applied to the Supreme Court for a stay of the mandate. Initially the Supreme Court on January 24, 1972, denied that motion and the Commission published a further notice of inquiry soliciting comments on the procedures and guidelines necessary to carry out the mandate of the Court of Appeals.

However on February 28, 1972, the Supreme Court granted certiorari and also stayed the mandate of the Court of Appeals. The Commission then withdrew the notice of inquiry soliciting comments. Thus, the Court of Appeals' decision voiding the flat ban of paid public issue announcements is an abeyance at the present time pending a Supreme Court decision.

You ask "If the airbag units installed in the Allstate vehicles were reliable, and the commercials only discussed the test results, would this still constitute a 'controversial' aid?" In a recent court case, the United States Court of Appeals held that commercial announcements for large cars and leaded gasoline implicitly discussed one side of a controversial issue and therefore raised fairness doctrine obligations. *Friends of the Earth* v. *F.C.C.*, ——— U.S. App. D.C. ———, ———F. 2d ——— (Decided August 16, 1971, Case No. 24, 5556). It should be noted that the subject of whether, in general, commercial announcements which implicitly discuss controversial issues of public importance raise fairness doctrine obligations is under consideration by the Commission in its fairness doctrine inquiry. *Notice of Inquiry*, F.C.C. 71–623, released June 11, 1971, However until resolution of that issue, the Commission must decide complaints in light of *Friends of the Earth, supra.* Therefore, depending on the content, a commercial announcement about air bags might be considered either an explicit or implicit discussion of one side of a controversial issue of public importance. In any event, the Commission does not normally rule on cases of this type unless it is in possession of all the facts from each of the parties concerned.

You also ask whether the issue of automobile safety in general is a controversial issue of public importance, and whether widespread exposure on news programs of the failure of air bag tests and an adverse statement by Henry Ford regarding the air bag on the *Today Show* (May 31, 1972) mean that a new balance must be struck by accepting Allstate's paid ads? As you know, the fairness doctrine requires a station which presents one side of a controversial issue of public importance to afford reasonable opportunity for the presentation of contrasting views in its overall programming,which may include news programs, interviews, discussions, debates, speeches and the like. The purpose of the doctrine is to promote the fullest possible robust debate on public issues. The fairness doctrine does not require precise equality in opportunity such as is required for candidates for public office, but rather that reasonable opportunity be afforded. Moreover, the licensee has considerable discretion in determining whether a controversial issue is involved, and if so, the manner and timing of presenting contrasting views. Therefore before a determination can be made as to what obligations a licensee has in presenting the opposing side, it is first necessary to know what the licensee has done in its overall programming on the issue.

It is hoped that the above information is fully responsive to your inquiry and, inasmuch as you may wish to retain your enclosures, they are being returned. Should you desire any further information concerning this matter, please do not hestitate to call on me.

Sincerely,

DEAN BURCH, *Chairman.*

85–820 O—73——7

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C., August 14, 1972.

Mr. ARTHUR TAYLOR,
President, Columbia Broadcasting System,
New York, N.Y.

DEAR MR. TAYLOR: At hearings before the Senate Commerce Committee on July 25, 1972, Mr. Donald L. Schaffer, Vice President, Secretary and General Counsel of the Allstate Insurance Company testified that the Columbia Broadcasting System to date has refused to accept paid advertisements depicting Allstate's successes with the airbag. Mr. Schaffer stated that CBS indicated that they were in the process of completely restructuring their acceptance procedure for commercial messages, but indicated that it would probably refuse all commercials which do not relate directly to a product of the advertisers. Mr. Schaffer further states that after the tests and commercials were completed, they were submitted to CBS which subsequently rejected them on June 20, 1972, because airbags were not an Allstate product.

It has been the continuing interest of this committee to further the cause of automobile safety. Because of my involvement as Chairman of the Surface Transportation Subcommittee, I am deeply concered at circumstances which appear to have prevented Allstate from airing at its own costs, commercial messages honestly and openly designed to promote the cause of automobile safety.

I would hope that CBS would explain how the public interest standard Congress promulgated to guide your activities will be served by your action.

I have enclosed a copy of Mr. Schaffer's statement for your information.

Sincerely yours,

VANCE HARTKE,
Chairman, Surface Transportation Subcommittee.

CBS TELEVISION NETWORK,
New York, N.Y., August 29, 1972.

Hon. VANCE HARTKE,
U.S. Senate,
Washington, D.C.

DEAR SENATOR HARTKE: In reply to your letter of August 14 to Arthur R. Taylor, President of CBS, Inc., there are several reasons why the CBS Television Network declined to sell time to the Allstate Insurance Company for presentation of their commercial announcements on airbags. I should like to note at the outset that there apparently has been some misunderstanding on the part of Allstate regarding our position.

According to the statement of Donald L. Schaffer, Vice President, Secretary and General Counsel for Allstate, which you provided, he stated that "CBS indicated they were in the process of completely restructuring their acceptance procedures, but indicated they would probably refuse all commercials which did not relate directly to a product of the advertiser." Our acceptance procedure for commercial announcements is continually examined and altered as products change and knowledge increases. However, there is no complete "restructuring" either underway or contemplated.

The second part of Mr. Schaffer's statement misinterprets a portion of that acceptance procedure. Commercial time on the network is available for the selling of products or services, but not for the advocacy of positions of controversial issues. (The exception to this, of course, is in the political area.) As Mr. Schaffer notes in his statement, "airbags have fueled a whole new generation of debate . . ."—a recognition that the subject of airbags may well be considered a controversial issue. It is a subject that has been covered, as appropriate, in news.

It would in our view disserve the public interest if we were to sell air time in the market place to advocates of controversial issues. The advocate with the fattest purse would obviously have greater opportunity to put forth his views. Equally important, as with any controversial issue, the fairness doctrine and CBS' own standards require treatment of more than one point of view. Therefore, to carry an Allstate advertising schedule in favor of airbags might conceivably force us into some sort of "balanced treatment", possibly by paying inordinate or unnecessary attention to the negative aspects of airbags in news or other programming. This position is not new to CBS. We have long refused to sell time

to individuals, organizations, and companies who wish to promote one side of a controversial issue.

In rejecting the airbag announcements, the CBS Television Network Program Practices Department also believed that the message might be misleading. The thrust of the Allstate commercials as submitted was that the airbag provides the best possible passive restraint system. However, no airbag was demonstrated on the driver's side of the vehicle. When we asked, a representative of the advertising agency told us that as yet a foolproof airbag had not been developed for the driver. In itself, this is misleading to the public and would be so until the driver enjoys the same protection as that apparently provided the passenger. It also would be misleading to have the viewer believe that the airbag may be the ultimate answer without telling him—as Mr. Schaffer did in his prepared statement—"that presently available airbag systems were not effective in rollovers, second impacts, non-frontal impacts, and low-speed collisions, and for that reason the lap belt should be retained and interlocked in a way that required its use in the front seat positions." I am sure that it was not Allstate's intention to mislead, but I am equally sure that many would be misled.

While you may disagree with our position in this matter, I wish to emphasize that we rejected this commercial only after thoughtful consideration of the copy claims, both explicit and implicit, and in our genuine interest to serve the public as best we know how.

Cordially,

ROBERT D. WOOD.

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C., August 14, 1972.

MR. ELTON RULE,
President, American Broadcasting Co.,
New York, N.Y.

DEAR MR. RULE: At hearings before the Senate Commerce Committee on July 25, 1972, Mr. Donald L. Schaffer, Vice President, Secretary and General Counsel of the Allstate Insurance Company claimed that the American Broadcasting Company refused to accept paid advertisements regarding Allstate's successes with the airbag. Mr. Schaffer stated that ABC initially indicated that airbags were controversial and they would not accept commercials relating to this subject. Upon reconsideration, Mr. Schaffer stated that ABC once again rejected the commercials on the basis that airbags are only one of many systems of passive restraints and are therefore considered controversial. Mr. Schaffer stated that the commercials were resubmitted to ABC a third time on July 19, 1972 after some minor changes and this request is still pending.

This Committee has been deeply involved over an extended period of time in efforts to promote automobile safety. Because of my involvement as Chairman of the Surface Transportation Subcommittee, I am deeply concerned that circumstances appear to have prevented Allstate from airing, at its own cost, commercial messages honestly and openly designed to promote the cause of automobile safety.

I would hope that ABC would explain how the public interest standard Congress promulgated to guide your activity will be served by your action.

I have enclosed a copy of Mr. Schaffer's statement for your information.

Sincerely yours,

VANCE HARTKE,
Chairman, Surface Transportation Subcommittee.

AMERICAN BROADCASTING CO.,
New York, N.Y., August 22, 1972.

HON. VANCE HARTKE,
Chairman, Surface Transportation Subcommittee, Committee on Commerce, U.S. Senate, Washington, D.C.

DEAR SENATOR HARTKE: Your letter of August 14th to Mr. Elton Rule, President of American Broadcasting Companies, Inc., has been referred to me for reply.

At the outset, let me assure you that we at ABC are in full accord with the goals of the Senate Commerce Committee in promoting automobile safety.

With respect to your specific inquiry, we have rejected proposed commercials for the Allstate Insurance Company regarding the airbag safety device, because, in our opinion, the proposed advertising copy constituted a discussion of a con-

troversial issue of public importance for which, as a matter of general policy, ABC does not accept commercial orders and because we felt that the copy should mislead viewers as to the degree to which airbags have actually been perfected.

For your information, we are continuing to work with Allstate's advertising representatives in the hope that with revisions the commercials will comply with ABC's standards. In this regard, I am enclosing herewith copy of my letter of August 16, 1972 to Mr. Richard L. Cullen of the Leo Burnett Company, Inc., advertising agency for Allstate Insurance Company, which gives the specific reasons why ABC has been unable to approve the proposed airbag commercial for telecast.

For your further information, we have approved for telecast a commercial announcement on behalf of another advertiser in which the copy refers to the development of airbag restraint systems that hopefully will save lives in a manner which does not, in our opinion, involve the discussion of a controversial issue.

I trust this explains the position we have taken with respect to the proposed Allstate Insurance commercials.

Sincerely,

ALFRED R. SCHNEIDER,
Vice President.

AMERICAN BROADCASTING CO.,
New York, N.Y., August 16, 1972.

Mr. RICHARD L. CULLEN,
Leo Burnett Co., Inc.,
Chicago, Ill.

DEAR DICK: I have your letter of July 19, 1972, requesting a reaction to your revised copy of the Allstate air bag commercials.

We have reviewed your revised scripts and still believe that the commercials could mislead viewers as to the degree to which air bags have actually been perfected as a reliable safety device. For instance, it is my understanding as expressed by you at our recent meeting that air bags have been developed for the front seat passenger only. Your commercials do not make this point clear and, in fact, create a contrary impression.

In addition, we still believe that the efficiency of the air bag is a controversial issue. The issue has not finally been resolved in several areas, including the ability to maintain reliability when the device is placed in mass production.

We would be happy to continue working with you and will consider any further revisions you might care to submit. I might suggest that a possible direction might be to emphasize the potential promise of this device for the future and the impressive start which has been made.

Sincerely,

ALFRED R. SCHNEIDER,
Vice President.

NATIONAL BROADCASTING CO., INC.,
Washington, D.C., August 8, 1972.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Commerce,
U.S. Senate,
Washington, D.C.

DEAR MR. CHAIRMAN: At the recent hearings of the Senate Commerce Committee concerning the National Motor Vehicle Safety Act of 1966, Mr. Donald Schaffer, Vice President of All State Insurance Company, testified concerning his company's interest in the broadcasting of air bag spots. Mr. Schaeffer, at several points in his testimony, mentioned a meeting he had attended with executives of NBC to discuss the question.

Because of this, and in order to make your hearing records more complete, may I request that the enclosed letter of Mr. Herminio Traviesas, Vice President, Broadcast Standards for NBC, be included in the permanent record of those hearings following the testimony of Mr. Schaeffer.

Thank you for your assistance.

Sincerely,

PETER B. KENNEY,
Vice President.

Enclosure.

NATIONAL BROADCASTING CO., INC.,
New York, N.Y., June 21, 1972.

Mr. RICHARD L. CULLEN,
Leo Burnett Co., Inc.,
Chicago, Ill.

DEAR DICK: As we promised during our recent meeting we have again reviewed the matter of "air bag" controversality. Our review has reinforced our earlier conclusion that this subject has once more become controversial.

I am sure you will recall that on April 13, 1972 members of my staff and of the NBC Law Department discussed with you, Mike Breslin and Don Schaeffer the nature of the "air bag" situation as it then appeared. We recognized at that time that the "air bag" question might have been controversial (and was so held by the FCC, Broadcast Action Report No. 10384, January 11, 1972), but the staff tentatively accepted your position that the "air bag" question had, thereafter, within a relatively short period of time, become essentially non-controversial.

I understand that you were also advised (as we routinely advise all clients where we feel there is any fairness obligation risk) that a matter such as this could become highly controversial overnight and that, if this should happen, we might, in view of our overall broadcast obligations, be compelled to withdraw approval. It is simply unfortunate that we cannot predict the actual events or the actions of people that can create public controversy where none appeared previously to exist.

Among the indicia of present public "air bag" controversy are the highly publicized test failures of "air bags", public statements by the AAA and other automobile groups opposing present installation of "air bags", and your own brochure (published, I understand, since the April 13 meeting) which refers to the "Air Bag Controversy." You will understand, of course, that the question of public controversy does not turn on the truth or falsity of the views expressed but upon the existence of public views which controvert them, no matter how lacking of public views which controvert them, no matter how lacking in actual merit the controverting views may be.

As we mentioned previously, we feel that subject matter which may tend to involve issues of public controversy is more adequately and more properly treated in news and public affairs programming than in the sale of commercial time. Among other considerations, a policy of unrestricted sale of time for discussion of controversial public issues would undoubtedly tend to the advantage of those parties most able to pay without regard to the merits of the issues.

The risk we mentioned that "air bags" could again become controversial has now apparently become a reality with attendant Fairness Doctrine implications. As we advised previously, we are not prepared to accept for broadcast at this time your "air bags" commercials.

Sincerely,

H. TRAVIESAS.

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C., August 14, 1972.

Mr. JULIAN GOODMAN,
President, National Broadcasting Co.,
New York, N.Y.

DEAR MR. GOODMAN: At hearings before the Senate Commerce Committee on July 25, 1972, Mr. Donald L. Schaffer, Vice President, Secretary and General Counsel of the Allstate Insurance Company testified that the National Broadcasting refused to accept paid advertisements depicting Allstate's successes with the airbag. Mr. Schaffer stated that NBC had earlier indicated that the commercials would be run if the tests on the airbags proved successful. NBC reserved the right to review the finished commercials after completion. Mr. Schaffer stated that the first commercials were scheduled to appear on May 28, 1972 on Meet the Press. But three days later, NBC contacted Allstate to ask if stand-by commercials could be supplied. Mr. Schaffer stated that on June 21, NBC formally rejected the commercials on the grounds that airbags were a controversial subject.

This Committee has been deeply involved over an extended period of time in efforts to promote automobile safety. Because of my involvement as Chairman of the Surface Transportation Subcommittee, I am deeply concerned at circumstances which appear to have prevented Allstate from airing—at its own cost, commercial messages honestly and openly designed to promote the cause of automobile safety.

I would hope that NBC would explain how the public interest standard Congress promulgated to guide your activities will be served by your action.

I have enclosed a copy of Mr. Schaffer's statement for your information.

Sincerely yours,

VANCE HARTKE,
Chairman, Surface Transportation Subcommittee.

NATIONAL BROADCASTING CO., INC.,
New York, N.Y., August 31, 1972.

Hon. VANCE HARTKE,
Chairman, Surface Transportation Subcommittee,
U.S. Senate, Washington, D.C.

DEAR SENATOR HARTKE: We appreciate your letter of August 14, and it has received our full consideration. We are, of course, aware of your concern about automobile safety, and it is a concern we at NBC share fully. Our record of news coverage and public service announcements over the years attests to this.

The particular issue raised by Mr. Donald L. Schaffer of Allstate Insurance Company in his testimony before your Committee July 25 is filled with so many complexities—some of them seemingly unrelated to the question of whether automobiles should be safe—that I have requested a detailed reply be sent to you by the senior NBC official most closely involved, our Vice President and General Counsel, Mr. Corydon B. Dunham.

I believe his explanation will satisfy you fully about NBC's dedication to serve the public interest.

With best regards,

JULIAN GOODMAN, *President.*

Enclosure.

NATIONAL BROADCASTING CO., INC.,
New York, N.Y., August 30, 1972.

Hon. VANCE HARTKE,
Chairman, Surface Transportation Subcommittee,
Committee on Commerce, U.S. Senate, Washington, D.C.

DEAR SENATOR HARTKE: This is in reply to your request (which we received on August 21, 1972) for an explanation of the circumstances requiring NBC to reject the air bag commercials of the Allstate Insurance Company. Julian Goodman has asked me to respond since I have been deeply involved in the Fairness Doctrine proceedings of the Federal Communications Commission for quite some time.

By letter dated June 21, 1972 (copy of which is attached) NBC informed Allstate's advertising agency that the commercials in question appeared to present one side of an issue of significant public controversy and would not be accepted for broadcast because of the Federal Communications Commission's Fairness Doctrine.

As we noted in the attached letter, the FCC staff had previously held that air bags were controversial under the Fairness Doctrine. This was in response to a two minute Ford commercial on automobile safety which contained what we regarded as only a passing reference to air bag development and reliability. Based upon our belief that the commercial was not controversial, we accepted it for broadcast and did in fact carry it on the network three times. The FCC staff decided that it was controversial but that we had presented sufficient news and public affairs coverage of the air bag question so that the air bag reference in the three broadcasts did not create an imbalance. A copy of both the Ford commercial and the FCC ruling are attached.

But for the fact that NBC had given significant news and public affairs coverage to the air bag question generally, under the FCC's ruling, these three minor references would have required that NBC either conform its public affairs programming to balance the schedule of a commercial advertiser, or perhaps run counter commercials directly opposing the Ford commercials. Thus NBC's public affairs programming could be dictated by the advertising policies and schedules of its major commercial advertisers should NBC accept commercials which are deemed controversial under the Fairness Doctrine.

As you may know, the Federal Communications Commission is now conducting proceedings (Docket No. 19260) looking toward the formulation of compre-

hensive rules concerning applicability and compliance with the Fairness Doctrine. These proceedings have been quite extensive, including five full days of public hearings (from March 27 through 31, 1972) and the filing of hundreds of briefs and reply briefs exhaustively exploring every aspect of the Fairness Doctrine in ways that are much too complex to be touched upon in this brief letter.

In addition to the FCC ruling that commentary on air bags was controversial when the Ford commercials ran. Allstate has indicated that it presently considers the air bag commercials to be controversial. Please note for example Mr. Schaffer's statement before your committee that "As an insurance company, Allstate entered the air bag controversy," and "air bags have fueled a whole new generation of debate." Allstate has even, we understand, published a brochure which is entitled "The Air Bag Controversy." These and other indications mentioned in our June 21 letter clearly establish, we believe, the presently controversial nature of the topic.

In your letter you relate Mr. Schaffer's statement that NBC had earlier indicated the commercials would be run if certain tests on the air bags proved successful. Actually, NBC had previously agreed to run, and in fact did run, a very light schedule of Allstate commercials which mentioned air bags. But on April 13, 1972 Allstate asked for approval of the present group of air bag commercials which it intended to have broadcast by NBC on a relatively heavy schedule.

On April 13, NBC staff discussed with Mr. Schaffer whether the air bag question may have by that time become non-controversial. As our letter of June 21 states, a tentative decision was made by the staff that perhaps the commercials could be accepted, but that it would depend upon our agreement that the air bag issue was not controversial. Acceptance was not in any way made dependent upon tests. The test failures which almost immediately followed, however, resulted in public reactions which together with other indicia illustrated that the air bag issue was in fact still highly controversial.

It has always been NBC's policy to present subject matter which may tend to involve issues of public controversy in programming that can deal fairly with the issues by indicating the significant contrasting points of view. Virtually insurmountable problems are encountered in trying to balance controversial issue arguments in one minute or 30 second commercials. For one thing, there are seldom just two opposing points of view. In fact, with regard to air bags, there appear to be several opposing points of view. How does NBC choose among these, and among competing spokesmen?

Another problem of attempting to balance under such circumstances is that the contrasting announcements will necessarily appear at somewhat different times over a different period of time, with each within itself being patently one-sided, and with no assurance that the same viewer who sees one of them will see any of the other contrasting ones. Thus the so-called "balance" is largely theoretical insofar as individual viewers are concerned.

A more pernicious problem is that to allow advertisers who have the resources to purchase national television advertising time to use that time, without limitation, to promote controversial editorial views, as opposed to the straightforward sale of products or services, would give a very definite advantage to the side of the controversy which has the most money regardless of the merits of that particular point of view.

Of course, without the straight jacket of recent FCC and court rulings on the Fairness Doctrine, there could perhaps be more flexibility in the acceptance of some types of commercials which might touch upon an issue of some public significance. However, under present circumstances, NBC's discretion is extremely limited when faced with commercials of the nature presented by Allstate, as the FCC ruling on the Ford commercial illustrates.

Incidentally, NBC's decision not to carry advertising promoting air bags is not quite so broad as may appear from all of the discussions and statements that have taken place. NBC would carry, and has in fact agreed to carry, commercial advertising by concerns which make or sell air bags and which refers to air bags without engaging in editorializing or presentation of any particular view which might be a present matter of controversy.

While we applaud your concern for automobile safety we feel that where matters in public controversy are involved. NBC as a broadcaster cannot promote "good" causes by accepting commercials arguing one side of the controversy. On such matters, we seek to inform public opinion through our programming, acting neither as the arbiter of what is "good" for the American people or the willing

instrument of others who seek to advocate an editorial position in their commercials. This, of course, does not depend on personal views NBC officials might have of the merit of the causes being espoused.

We appreciate your giving us this opportunity to present our views on a matter which is of great concern to us and which, we believe, should be of great concern to the Congress and the general public.

I hope you will see from the above that this is not a legislative oversight matter in the fashion in which it was raised by Mr. Schaffer. It is essentially a matter of the Fairness Doctrine of the Federal Communications Commission and of the related and complex issues which it has spawned.

Sincerely yours,

CORYDON B. DUNHAM.

Senator HARTKE. Our next witness will be Mr. Douglas Toms, who is Administrator of the National Highway Traffic Safety Administration. Mr. Toms was with us at length last week. I indicated at that time we had a whole series of questions which we did not ask. His opening statement was given at that time and this is a continuation those hearings.

Good morning, again.

STATEMENT OF HON. DOUGLAS W. TOMS, ADMINISTRATOR, NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Mr. TOMS. Good morning, Mr. Chairman.

That was a very interesting testimony this morning. I compliment the committee for their interest in this subject.

Senator HARTKE. Do you have a statement to make?

Mr. TOMS. No; Mr. Chairman.

Senator HARTKE. I want to continue the passive restraint section which we did not cover the other day.

The National Highway Traffic Safety Administration has concentrated solely on the air bag development to comply with the passive restraint requirements of standard 208; is that correct?

Mr. TOMS. Concentrated solely——

Senator HARTKE. Have you ignored other passive systems?

Mr. TOMS. No; we are also very interested in passive belts, Mr. Chairman.

Senator HARTKE. Pardon me?

Mr. TOMS. We are very interested in passive belts.

Senator HARTKE. All right.

Mr. TOMS. We have also done a considerable review of blankets and nets.

Senator HARTKE. How much money has NHTSA spent on air bag development?

Mr. TOMS. I would have to supply that for the record. I don't know that.

Senator HARTKE. Do you have an idea?

Mr. TOMS. I really don't. The issue of air bags, structure of the automobile, and other types of restraints are intermixed. It is not uncommon for us to run tests where perhaps we use bags and belts, intermittently.

(The following information was subsequently received for the record:)

DESCRIPTION OF ALL CURRENT TESTING AND DEVELOPMENT EFFORTS RELATING TO OTHER TYPES OF PASSIVE RESTRAINTS

On May 5, 1972, a contract was awarded Beta Industries to evaluate worthwhile passive restraint systems other than air bags. Evaluation is being made on the basis of performance simplicity, reliability, adaptatbility, apparent effectiveness, and consumer acceptability. Those systems which appear to be the most promising will be studied in greater depth to determine if they warrant further development and testing.

Also, the Research Institute of NHTSA is currently conducting a test program on passive belt restraint systems at the Naval Air Development Center, Philadelphia, Pa., under contract HS–063–1–0811A where a test sled, anthropometric dummies, and human volunteer subjects are available. Letters of invitation to participants in this program were issued October 1, 1971, to all members of the American Safety Belt Council and to those foreign manufacturers that had submitted information or comments to the Dockets on FMVSS 208 and 209.

Participants and/or invitees as of July 1972 are as follows:

Foreign manufacturers.—Takata-Kojyo Co., Ltd., Tokyo, Japan; Volkswagenwerk AG, Wolfsburg, Germany; Volvo, Inc., Goteborg, Sweden; Coenan-Wingaard, The Hague, Holland; Triumph Motor Co. Ltd., London, England; Auto Restraint Systems, Ltd., Witney, Oxon, England.

Domestic manufacturers.—American Safety Equipment Corp., Encino, Calif.; Hamill Manufacturing Co., Washington, Michigan; Irvin Industries, Inc., Greenwich, Conn.; Ford Motor Co., Dearborn, Michigan; General Motors Corp., Warren, Mich.

Phase I dummy tests are being conducted at speeds of 10, 20, 30, 35 and 40 mph. For those systems which indicate good dummy kinematic performance during Phase I, Phase II testing with human volunteers will be conducted at speeds up to the tolerance levels of the volunteer subjects. Subsequent barrier crash tests using dummies are contemplated.

A test program is also contemplated to provide comparative performance data for those passive restraint systems that do not fall into either the belt or air bag categories. Two such systems have already been developed such as the padded, moveable arm system developed by Accles Britax, Ltd., Surrey, England, and the passive bolster system developed by Minicars, Inc., Santa Barbara, Calif.

Air bag restraints.—Approximately $1.6 million.

Senator HARTKE. Does the experimental safety vehicle have funds allocated to that project?

Mr. TOMS. Yes, that is correct.

Senator HARTKE. Are those funds part of the passive restraint funds?

Mr. TOMS. No, the experimental safety vehicle is separately funded.

Senator HARTKE. What is the relative cost for the experimental safety vehicle as compared to the passive restraint research?

Mr. TOMS. I would guess that we are spending more on the experimental safety vehicle. Between $12 and $14 million have been expended for that program over a period of years.

Senator HARTKE. What percent of the experimental safety vehicle expenditures are involved in the passive restraint system?

Mr. TOMS. 10 or 15 percent.

Senator HARTKE. 10 or 15 percent. Is there research currently to upgrade the seat belt system to make them more effective at higher speeds?

Mr. TOMS. Yes. We have participated in seat belt development. We have, in addition, encouraged activity on behalf of the manufacturers of seat belts to experiment with shredding devices stitched into the webbing, various tubular types of webbings, that will stretch under a controlled rate, and also, various types of attachment hardware that would manage energy. I think the Philadelphia tests, Mr. Chairman, which are going on right now, where we have four or five—perhaps more—different types of belt systems with human volunteers, is our best program in that category.

Senator HARTKE. You contracted out for other passive restraint systems, is that right?

Mr. TOMS. Yes. Our Philadelphia work is with the Navy Department.

Senator HARTKE. Can you give us the names and amounts of those?

Mr. TOMS. We would be pleased to submit them for the record.

Senator HARTKE. They are not in your possession?

Mr. TOMS. No.

Senator HARTKE. How many contracts do you have for passive restraint systems at the present time?

Mr. TOMS. I don't know exactly. I could only give you an estimate.

Senator HARTKE. Would you provide for the record the names of those contracts, the amount of each, and the specific items to which they pertain?

Mr. TOMS. I would be pleased to.

(The following information was subsequently received for the record:)

Passive restraints

[Estimated funds in thousands of dollars]

Contract number:	
FH-11-6962 (air bag)	100
FH-11-7574	219
FH-11-7607	215
HS-024-1-164	125
HS-024-1-165	120
HS-053-1-168	320
HS-053-2-280	212
HS-113-2-484	215

SUMMARY OF THE RESULTS OF AIR BAG TESTS CONDUCTED DURING THE PAST SEVERAL YEARS

Fiscal Year	Contract	Title	Remarks
1969	FH-11-6962, University of Michigan.	Integrated restraint development.	Demonstrated 30 m.p.h. frontal protection capability.
1970	FH-11-7574, CAL	Advanced IORS development.	Conducted applied research to support 50 m.p.h. goal.
1970	FH-11-7607, Wayne State.	Air bag restraints for drivers.	Demonstrated 35 to 40 m.p.h. frontal protection capability.
1970	PO-1-6618, Holloman AFB.	"Impact biomechanics and protection system studies."	Tests were conducted on the Daisy decelerator impact sled with baboon subjects restrained by an air bag/lap belt combination and an air bag alone. Although the baboons suffered some abdominal injuries from the lap belt during tests with the lap belt/air bag combination, the baboons restrained by an air bag suffered no serious injuries. The maximum crash severity of these tests was 60 m.p.h., 120 G. Tests were also conducted on the Daisy decelerator impact sled with human subjects restrained by an air bag/lap belt combination, and the subjects had no medically reportable injuries. The maximum crash severity was 18 m.p.h., 12 G.
1971	HS-017-1-017IA, Holloman AFB	"Impact biomechanics and protection system studies."	Air bag tests were conducted when human subjects were in various seated postures and various seat locations in a stationary vehicle. These tests were mechanically equivalent to an air bag being inflated in a vehicle moving at constant veolcity. The purpose was to determine the effects of air bag inflation on out of position occupants, i.e., leaning forward toward dash, legs crossed, etc. 41 tests were conducted without serious injury. 35 tests were conducted on the Daisy decelerator impact sled with human subjects restrained by only an air bag, and subjects had no medically reportable injuries. The maximum crash severity was 31 m.p.h., 22 G.
1971	HS-024-1-164, Southwest Res. Inst.	Improved air bag restraints for subcompact car drivers.	Demonstrated 30 to 35 m.p.h. frontal protection capability.
1971	HS-024-1-165 Southwest Res. Inst.	Improved air bag restraints for subcompact car occupants.	Demonstrated 30 to 35 m.p.h. frontal protection capability.
1971	HS-053-1-168 CAL	Inflatable occupant restraints for rear seat occupants.	Demonstrated 45 m.p.h. frontal protection capability.

Senator HARTKE. Now under the requirements for standard 208, there is no requirement for belts, is that correct?

Mr. TOMS. 208 is purely a performance standard, Mr. Chairman, and does not contain any language that would specify a type of restraint.

Senator HARTKE. Does the Administration take a position in regard to the necessity of lap belts with the air bags?

Mr. TOMS. Yes. It is our belief that with an aspirated bag, a lap belt is necessary. Any type of bag that is high-mounted, that is, mounted in the notch between the windshield and the dash panel, requires a lap belt to control the lower portion of the body.

There are alternatives to the lap belt. You could also use a knee belt, as Volkswagen advocates. You can also use a knee bar. But you have to use something of this type together with a high-mounted bag to control the lower torso. We think that the aspirated bag and a lap belt might be one of the lowest cost systems. But we don't believe that we should require a lap belt or require a three-point belt or any other type of belt, or knee bar or knee belt, because there are so many different kinds of restraint systems, and different approaches to the problem at this stage of development. It is important to encourage this development and innovation.

Senator HARTKE. Do you have any further comments that you would care to make on the testimony you have heard this morning?

Mr. TOMS. We compliment Allstate. As you know, we have worked closely with them.

Senator HARTKE. I know you have.

Mr. TOMS. We think this is a sincere effort to acquaint the public with the other side of the question. This is something that we in the Government cannot directly do. We give them high grades. We think it was very carefully done and tells the story objectively.

Senator HARTKE. All right. Fine.

Senator COOK. May I speak?

Senator HARTKE. Yes, Senator Cook.

Senator COOK. First of all, you say that you don't think that seat belts would be required, and yet Allstate says they think they should be.

Mr. TOMS. No, we think they may be necessary together with a high-mounted bag, Senator Cook. We think both are important.

Senator COOK. All right, let's take some of the pictures we saw in which there was not a point of jarring an air bag loose, which was tremendously important to me. You saw them go over rough terrain, you even saw them go over a mountain. I hope not very many people do that at 45 miles per hour. But you must admit that without the deployment of the seat bag, you could have serious repercussions if there had not been lap belts.

Mr. TOMS. Our performance standard requires protection for lower speed impacts. We think the manufacturer should have a choice to provide a belt or padding; but he must meet these performance requirements. It should be the manufacturer's jurisdiction to determine what device he uses and we think that that selection——

Senator COOK. If you say that is his jurisdiction, and yet you are imposing a restriction that air bags be in all automobiles, or some passive restraint be in all automobiles by the 1976 model, why do you take

the position that you can impose one on him, but you can't impose the other on him?

Mr. TOMS (continuing). Because the requirement for 1976 also provides the same standards for the low-speed impacts as well.

Senator COOK. What do you think of Allstate's determination that air bags should be deployed in the front seat only at this stage of the game?

Mr. TOMS. It is true——

Senator COOK. And this should be the paramount objective to be reached?

Mr. TOMS (continuing). I think we substantially agree with them.

Senator COOK. You see, what bothers me about it, you say they conduct a test that somehow or other you can't conduct. I can't quite figure out in my mind why you have spent such tremendous amounts of money, let's say on the automobiles that you tested at Phoenix, when in fact you could have been testing standard models, when you were involved in the Wayne State tests——

Mr. TOMS. We were not involved in Wayne State.

Senator COOK. (continuing). You were not involved in Wayne State. But you did have tests on March 31, I believe, or sometime in March—March 30?

Mr. TOMS. The ESV, yes, we had the ESV tests.

Senator COOK. Let me say this. I have requested on several occasions the results of those tests. They have not been made available, and I'm now going to ask you to put the results of the Phoenix test in this record, put the results of the March test in this record, because at least that is one way we will get them in, and one way we will see them.

Mr. TOMS. If you did not receive them, it was because they were not yet ready, it was not because we were not desirous of giving them to you.

(The following information was subsequently received for the record:)

ESV TESTING

The AMF and Fairchild ESV's were delivered on schedule in January and February 1972 to an independent test contractor in Phoenix. Both cars generally satisfied the ESV specifications in the accident avoidance areas of handling, steering, overturn immunity, and visibility. With regard to braking, however, the Fairchild vehicle did not meet requirements under the stringent test conditions due to failures in the system that occurred during testing.

Both vehicles met the front and rear, low speed (10 mph), no damage requirement with no difficulty.

On March 21, 1972, the AMF vehicle was barrier crash tested at a velocity of 49.7 mph. All systems functioned, including front and rear airbags. Forces on the anthropomorphic dummy simulating the drivers were within specification requirements. The structural integrity of the vehicle was also outstanding.

The Fairchild ESV was barrier crash tested at a velocity of 48.95 on April 18, 1972. The air bags did not function and the three dummy occupants were "killed." Detailed analysis revealed that a human error in wiring was the cause of the malfunction. After a crash of this magnitude, the condition of the vehicle structure was very impressive.

The Fairchild and AMF ESV's were crashed into a pole on July 14, 1972, and July 25, 1972, respectively, with the center of the right, front door as the point of impact. Velocity of the Fairchild vehicle was 14.49 mph and AMF's was 14.85 mph. No significant intrusion and no serious injuries or fatalities occurred in either vehicle.

Results of the ESV testing, with the exception of the pole crashes, were presented at the Third International ESV Conference in Washington, D.C., on June 1, 1972.

Senator Cook. Now, when were the Phoenix tests?

Mr. Toms. They were in April.

Senator Cook. And you have not completed your findings in those tests yet?

Mr. Toms. Have they submitted the final report? If the report is ready, we would be pleased to deliver it to you. I have not yet seen it myself, Mr. Chairman.

Senator Cook. We have requested it, and obviously somebody has seen it. We have not been able to get a copy of it.

Mr. Toms. We have seen parts of it, but I don't think the contract has been closed yet. Dynamic Science is still probably in the process of evaluating some of the massive amounts of data that were collected.

Senator Cook. When do you——

Mr. Toms. I might also add, Senator Cook, that the ESV really was not a near production effort. We considered this to be a "blue sky" effort. This was stretching out the boundaries of knowledge in this subject field. We intend in the future to have two kinds of experimental safety vehicle programs. We are now embarking on a near production program, which would be closer to what you saw from Allstate this morning. We are also continuing the pure experimental type of program that we have been involved in. This would be crashes in a 50–60 mile per hour barrier range. We think this is a proper role for the Government to play, to attempt to break the barriers of technology, and get into fields that do not relate themselves, at this point in time, directly to production cars.

Senator Cook. The thing that bothers me—and maybe this is one of the areas I'll agree with the chairman—is that here these tests were conducted by Allstate on ordinary automobiles that can be bought off the end of the line, and they proved to be rather remarkable tests. And yet the tests that were conducted that were aired to the public were not only aired for the airbags, but they were aired for extension bumpers, they were aired for a multitude of things, and as a result of the air bag not inflating, all the bad publicity was geared to that particular item and no other.

Now, this seems to me something that your agency could have overcome. I think we should overcome it in the public mind, for instance, now that we hear equipment was put together the night before on the Wayne State experiment. It was equipment that was not standard. It was equipment that was outmoded, that was 18 months to 2 years old, that this is another item that could have been overcome.

Mr. Toms. Well, Senator Cook, the council which did conduct the tests at Wayne State conducted an investigation and presented a white paper discussing the results of that inquiry. It was made available to the press and the public. We had no role in it. Because they are our advisory council, we naturally were a little bit reluctant to try to step in and take a piece of their action.

Senator Cook. Let me say this, now. You are the administrator of this agency and you have been an ardent, enthusiastic backer of air bags.

Mr. Toms. And passive belts.

Senator Cook. And passive belts. But the point I am trying to make is here are two major tests made available on a news item basis to the public, when in fact your agency should have immediately, immediately counteracted not by a white paper, but by a very, very strong

public statement as to the problems that occurred as a result of those tests.

Mr. SCHNEIDER. Senator Cook, if I may respond to your statement, sir, we did issue a press release. There is no way to control what disposition the media makes of our press releases.

Mr. TOMS. Nor do we want to.

Mr. SCHNEIDER. I agree. But our press release, after the Phoenix test, went out within a matter of 24 hours, I believe. I could double-check on that—it just wasn't picked up by the media.

Senator COOK. The point of it is, if your press release was 24 hours later than the film, you were already dead.

Now, frankly, if that film went on national television that night and you issued a press release 24 hours later, then I want to tell you you weren't even in the ball game.

Mr. SCHNEIDER. Senator Cook, the press release addressed itself to why the failure occurred. At the time the car was crashed no one knew why the bags did not deploy. As soon as we knew, we issued a statement.

There was a press conference immediately after the ESV crash. Mr. Toms and Secretary Volpe conducted that press conference. This matter was discussed. However, the media chose to highlight the failure.

Mr. TOMS. We are just as concerned, let me assure you, Senator Cook, about those failures as you are.

Senator COOK. Mr. Toms, let me tell you. I think the real problem was that the Federal Government spent—how much money did each one of those vehicles cost?

Mr. TOMS. About $4 million.

Senator COOK. $4 million a car, and yet somebody frankly just stole the whole show from you by getting 200 automobiles off the end of a line with standard equipment and conducting tests that wound up being successful.

Mr. TOMS. We are talking about two very different efforts. The ESV was not designed principally to develop passive restraints. The major objective was to prove that the vehicle structure was capable of withstanding the 50-miles-an-hour barrier crash while providing survivability for the occupants. We believe that the press that we received with the ESV crashes in April was probably a great deal more than has been generated on this subject.

Senator COOK. Just remember, nobody remembers when you do right; everybody remembers when you do wrong. And you had a $4 million vehicle, and we still haven't seen the results of the test on the other parts and the other functions that test was to perform. But the whole Nation found out that an airbag didn't work.

Mr. TOMS. I should also state this: whereas our cars cost about $4 million, some of the cars that were produced by the domestic manufacturers and our overseas manufacturers each cost as high as $8 to $12 million. So we feel that the Government, in the process that they employed, did get a reasonable value for the dollar invested.

Senator COOK. I have no objection to that. But the customer who wants to buy an automobile didn't get any value for a test on a $4 or $10 or $18 million vehicle. He is interested in exactly what we have been watching here today—whether we are going to overcome the basic fear that these will not work, that they will work at the wrong time, or

whatever the case may be. And it is unfortunate that as a part of Phoenix tests, frankly, you had to add an airbag. It is too bad that you didn't run those tests on the structural value of the automobile and not become involved in the situation that became the paramount issue of the tests after they were through, regardless of whether you or anybody else in the department tries to downgrade the fact that this was not the paramount issue of the test.

Mr. SCHNEIDER. Senator Cook, we are about to engage in a fleet test of our own. We have been trying for many, many months to work out an arrangement with Ford Motor Co. to get some of those same cars that you saw on the screen today, 125. We finally—and, believe me, after extensive and complex negotiations——

Senator COOK. How come it was so complex for us and it was so easy for Allstate?

Mr. TOMS. Thank you for that question. We wanted to make that point.

Mr. SCHNEIDER. It was very difficult for us because of certain conditions that Ford Motor Co. was placing upon us.

Senator COOK. You mean those same conditions, whether you know or——

Senator HARTKE. What were the conditions?

Mr. SCHNEIDER. They related primarily to the issue of liability. As most of you know, the Government cannot enter into a hold-harmless agreement. Ford wanted us to have a hold-harmless argeement. For the nonlawyers who are here, that would have meant if anything went wrong and Ford were sued and there were a judgment against Ford, they wanted Uncle Sam to pick up the tab. We couldn't do that. It would be illegal for us to do that.

Senator COOK. Is Mr. Schaffer here?

Did Allstate enter into a hold-harmless agreement with the Ford Motor Co.?

Mr. SCHAFFER. Yes; we did, and we wrote the liability coverage for the Federal Government on that.

Mr. TOMS. It was Allstate that came to our rescue.

Mr. SCHNEIDER. Allstate came to our rescue after weeks of working out the problem. Allstate was tremendously cooperative and Allstate wound up insuring, in effect, Ford's hold-harmless problem.

Senator COOK. In fact, as a lawyer, and lawyer to lawyer, wouldn't that be a logical way to overcome the Government's hold-harmless requirement, its lack of being able to hold-harmless a manufacturer?

Mr. SCHNEIDER. That's correct, sir.

Senator COOK. It wouldn't take weeks of negotiation to know that you could insure that responsibility, would it?

Mr. SCHNEIDER. No, sir. However, if you were to live through, sir, what I lived through, I think you could appreciate the time involved. It took a heck of a lot of time to obtain agreement among all parties.

Senator COOK. It is too bad it takes the Government longer than it takes a private enterprise in the United States to accomplish the same thing.

Mr. TOMS. We would really appreciate it, Mr. Chairman and Senator Cook, if the Congressmen help us to get around some of this red-tape from time to time. But many of these requirements are imposed upon us by the Congress of the United States.

Senator HARTKE. This is one reason why, during our earlier hearings, I insisted we have an increase in funds, and provided $6 million above what the Office of Management and Budget asked for.

Senator COOK. But even the increase in funds does not overcome the governmental responsibility of not being able to hold-harmless. Now, is that not correct? Because even then, you had to cover it by liability insurance.

Mr. TOMS. That's correct.

Mr. SCHNEIDER. But the liability insurance was a cost incurred by Ford, or a cost actually borne by Allstate, because Allstate was extraordinarily generous in the premium they charged Ford to get the coverage that they were getting to take care of the hold-harmless problem.

Senator HARTKE. You do not feel that Allstate in any way has interfered with your development program, do you?

Mr. TOMS. No; they have assisted us, they have been very supportive.

Senator HARTKE. The experimental safety vehicle deals with much more than just immediate passive restraints, correct?

Mr. TOMS. The airbag is really a very small part of it.

Senator HARTKE. Senator Cook says that they stole the show from you. I am not interested in who steals the show. I am interested in who saves the lives and this is your interest also.

Mr. TOMS. That's correct.

Senator COOK. Let me say, Mr. Chairman, that I don't want it understood that you and I don't have the same thing in mind. I am merely saying that it is unfortunate that as far as the ordinary commercial sale of vehicles on the highway every day, that your organization did not go into that field of testing long before it went into the testing of the sophisticated automobiles that you are now testing for items of manufacture in the future that have much more significance and latitude, really and truly, than the unfortunate significance of the one item on that vehicle that didn't work at the time it was tested.

Mr. TOMS. Let me tell you, Senator, one of the things that would probably be of interest to you. When I first got into this job, I became very irritated that some of the human testing that we had been doing and some of the baboon and dummy testing that we were doing could not be used as shorts on television. As a matter of cost and efficiency, we refrain in our testing work from using motion picture grade film and spending the money for cameras and the kind of equipment that can be used on evening news shows. Enormous amounts of money are saved by the Government by using plain black and white, low cost film footage. I, at one point, said why can't we make that change and why can't we go ahead and use it so that we can tell our story better afterwards.

Well, it is the judgment apparently of many people who preceded me that this was an unnecessary use of the taxpayers' money. So there are restraints like that one and hundreds of others that prevent us from preparing a commercial and presenting it to the American public to try to sell an idea. As a result, this is something that we have to depend on organizations like Allstate to do.

Senator HARTKE. Mr. Toms, does the law prohibit you or does the availability of funds?

Mr. TOMS. It is policy and——

Senator HARTKE. Doesn't the law under the consumer information section provide that you could do this?

Mr. TOMS. In consumer information we bring to the public information by means of public advisories or reports. We cannot go out and conduct major crash programs such as those with our human volunteers and the baboons and dummies for the sole purpose of attempting to sell an idea.

Mr. SCHNEIDER. Mr. Chairman, I may be wrong in this, but it is my understanding that we are legally prohibited from using appropriated funds for the purpose of buying TV time.

Senator HARTKE. Could you use legally appropriated funds to prepare the commercials to be used free by the networks?

Mr. SCHNEIDER. Yes; and we do that.

Senator HARTKE. All right.

Mr. TOMS. The significant difference between the ESV and Allstate's work that you saw, Dynamic Sciences, is that they hired a professional film crew that were in the business of making public commercials. Our people are technicians. They are only interested in capturing the immediate point of impact. Further, very often these films are totally unsuited for use as commercials.

Senator HARTKE. I want to discuss mandatory recall, all right? How many automobiles were recalled yast year, Mr. Toms?

Mr. SCHNEIDER. 14 million.

Senator HARTKE. 14 million?

Mr. SCHNEIDER. Yes, sir.

Senator HARTKE. How many vehicles have been recalled since the implementation of the act of 1966?

Mr. TOMS. About 30 million.

Senator HARTKE. How many?

Mr. TOMS. About 30 million.

Senator HARTKE. 30 million. Almost half of the total recall were recalled last year; correct?

Mr. SCHNEIDER. By last year, we mean the last fiscal year, sir.

Senator HARTKE. With regard to the Corvair heater defect, do you remember how many vehicles were subject to the notification requirement?

Mr. SCHNEIDER. 760,000.

Senator HARTKE. How much would it cost the consumer to effectuate the repair on the Corvair?

Mr. SCHNEIDER. $180 to $200 a car.

Senator HARTKE. Did General Motors pay for the cost of those repairs?

Mr. TOMS. They did not.

Senator HARTKE. They did not. How much again?

Mr. TOMS. $180 to $200.

Senator HARTKE. What percent of Corvair owners took their vehicles to the repair shop to be inspected or repaired?

Mr. SCHNEIDER. The latest figures, at least that I know from memory, sir, are about 39,000 or 40,000.

Senator HARTKE. 39,000 or 40,000 out of how many?

Mr. SCHNEIDER. 760,000 letters were sent, but a lot of letters came back with "address unknown," which resulted in, as the committee staff knows, our urging GM to send a second followup letter to owners. Only 150,000 responses were received.

85-820 O - 73 - 8

Senator HARTKE. 150,000 responses and about 40,000——

Mr. SCHNEIDER. People actually took their cars in.

Senator HARTKE. About 6 percent of the total, right?

Mr. SCHNEIDER. That's correct, sir.

Senator HARTKE. In other recalls where the manufacturer offered to pay for the repair, what percent of the owners had their vehicles repaired?

Mr. SCHNEIDER. A significantly higher percent.

Senator HARTKE. Do you have an estimate?

Mr. TOMS. It ranges, Mr. Chairman, from as low as 10 percent up to as high as 50 or 60 percent.

Senator HARTKE. If the repair is to be done at the manufacturer's expense, then there is a higher participation?

Mr. TOMS. No question about it. That is probably as good an illustration of human nature as you can get.

Senator HARTKE. All right.

Mr. SCHNEIDER. But in fairness, and I am not trying to defend GM on this, believe me, we are in litigation with them on other matters. The age of the cars made it difficult to obtain really accurate information on identities of the current owners. To get the current names and addresses of present owners of 12-year-old vehicles any manufacturer has to go through contracts or to the State motor vehicle departments, and those lists aren't always correct.

Senator HARTKE. You are saying in substance that the Corvair was an older model car, therefore, it was much more difficult to locate the owners.

Mr. SCHNEIDER. That's correct, sir.

Senator HARTKE. All right. At the committee's Corvair heater hearings in February, Mr. Toms, you endorsed a bill which was to remove all unsafe vehicles from the road. What is your position on that amendment at this time?

Mr. TOMS. Well, the Department is favorably disposed toward the general concept of mandatory recall and remedy. We don't believe the need for legislation is quite as critical since the recall performance of the industry has been fairly good. Nevertheless, should the Congress be disposed to enact legislation, we believe that certain procedural safeguards should be included.

Senator HARTKE. That is your official answer. Well read. I'm glad counsel prepared that for you.

What is the Office of Management and Budget's position?

Mr. TOMS. I will let counsel answer, Mr. Chairman.

Mr. SCHNEIDER. I will speak to that.

Mr. Chairman, that is the official administration position.

Senator HARTKE. At the February hearings there were indications that the DOT supported the bill, while the Department of Commerce opposed it. Did Commerce win out?

Mr. TOMS. We think we won a partial victory, Mr. Chairman.

Senator HARTKE. A partial victory.

Mr. TOMS. Larry believes that, considering the circumstances, we probably won.

Senator HARTKE. In order to insure that as many defective vehicles as possible are recalled, the manufacturer must be required to repair the defective vehicle that he has marketed. Not only the cars in the

future, but also those on the market at the present time. You have stated again that you have no objection to that type of law being passed.

Mr. TOMS. That's correct.

Senator HARTKE. Do you object if we make this retroactive to April 1970? That was the date that the House conferees rejected my provision in the Senate bill, which would have required that the defective repairs should be effectuated at the manufacturer's cost.

Mr. TOMS. That is a very provocative question, Mr. Chairman. I would like to think on that and take a look at what it would do before I respond. I think that is very interesting.

Senator HARTKE. You will provide that for the record?

Mr. TOMS. Yes.

(The following information was subsequently received for the record:)

RETROACTIVE RECALL AND REMEDY

The NHTSA would not be favorably disposed to a retroactive mandatory recall and remedy provision. By making manufacturers liable for the costs of all recalls after April 1970, we would be subjecting manufacturers to a liability which did not exist at the time the manufacturer originally agreed to a finding of a defect.

Senator HARTKE. You said there had been about 30 million cars recalled in the last 6 years, is that correct?

Mr. TOMS. Yes.

Senator HARTKE. Then between one-fifth and one-fourth of every car on the highway has been subject to some type of recall, is that fair?

Mr. TOMS. I think that is a fair statement.

Senator HARTKE. Why such a large number? Are the automobile engineers sloppy? Are the manufacturers and the quality control practices inadequate? Just tell me, to what do you attribute this relatively high degree of defective vehicles on the highway?

Mr. TOMS. I think the quality control is a real factor. Also, the model changeover is a factor. In years past, there were significant changes such as total design changes every 3 to 4 years, and significant body and trim work changes every year. At such a rapid pace of turnover, it is very difficult to get your quality control down pat. The nature of competition in this country is such that the industry was scrambled to put in new engines, new drive trains, and many new mechanisms. Any time something is new, it takes a while to get the bugs out of it.

We have vigorously pursued the solutions to the problem of defective vehicles. Some defects have also been brought to our attention by people like Ralph Nader, Consumers Union, and many others. We have tried to get these vehicles recalled. There has been a considerable amount of effort in this area, and it has——

Senator HARTKE. Doug, have defects always existed, but we have never really sought them out?

Mr. TOMS. Correct. That is my belief. Secondly, I don't think the motoring public, Mr. Chairman and Senator Cook, really were conscious of defects, and people tended to just accept this. Now, the public attitude is changing. People feel that when they pay a lot of money for an automobile, it ought to function properly. Consequently, we are getting better reporting now, than we have ever had.

Senator HARTKE. Mr. Toms, I would like you to supply for the record a breakdown of the numbers of cars recalled by each manufacturer, indicate what percent of that manufacturer's total production since the 1966 act has been the subject of a defect recall campaign. In that report, if there has been any one automobile which has been recalled more than once, treat that as a separate incident and not as a combined.

Mr. TOMS. We would be pleased to do that, Mr. Chairman.

(The following information was subsequently received for the record:)

TOTAL PASSENGER CARS RECALLED VERSUS TOTAL PRODUCTION, SEPTEMBER 1966 THROUGH JUNE 30, 1972

Manufacturer	Production figures taken from automotive publications	Number of vehicles recalled	Percentage of recalls to production
American Motors Corp	1,755,029	393,429	22.4
Checker Motors Corp	36,400	1,458	4.0
Chrysler Motors Corp	7,912,635	1,088,955	13.8
Ford Motor Co	18,604,105	7,203,304	38.7
General Motors Corp	32,377,401	16,505,948	50.9
Alfa-Romeo, Inc	10,152	12,650	124.6
Bayerische Motern Werke	63,675	22,754	35.7
British Leyland Motors	406,429	210,510	51.8
Fiat Motor Car Co., Inc	207,984	69,446	33.4
Foreign Distributors Division (General Motors Corp.)	468,953	61,873	13.2
Mercedes-Benz of North America	180,259	29,147	16.2
Nissan Motor Corp. in U.S.A	1,528,097	519,711	34.0
Peugeot, Inc	29,778	10,750	36.1
Porsche-Audi	110,352	34,619	31.4
Renault, Inc	113,058	11,323	10.0
Rolls Royce	2,091	3,139	150.0
Saab Scaina of America	70,907	67,409	95.1
Saubura of America, Inc	31,461	1,494	4.7
Toyota Motor Sales, U.S.A	852,204	585,915	68.8
Volkswagen of America, Inc	3,351,336	761,562	22.7
Volvo, Inc	260,023	58,442	22.5

Senator HARTKE. What about the cars subject to recall, that have had nothing done about them?

Mr. TOMS. These are issues that concern us. I think an issue that also concerns us is the person who has a car with a defect who tries to get it fixed and who can't. I think both of these problems need a remedy.

Senator HARTKE. I am having lunch with the National Association of Automobile Dealers today in regard to the question of repairs. I am trying to get some type of high standards, or at least some standards. One of the most frustrating things is taking your automobile in. You do not know whether you have a reliable repairman.

Mr. SCHNEIDER. Mr. Chairman, one of the problems here, of course, is that a recall usually encompasses a large vehicle population. The difficult thing that is the unknown is how many cars within that population have the defect. Until an inspection is made, there is really no way of knowing. This is why we insist on having the broadest scope of recall and the manufacturers generally agree to have all such cars brought in and checked. Oftentimes, the car doesn't have to be fixed because the defect isn't there. But as Mr. Toms has pointed out, we are very concerned that in some recalls there is no way of knowing the number of such cars that are really defective.

Senator COOK. Isn't there really another problem as you deal between the manufacturer and the dealer that the chairman referred to just a minute ago, that there is a real problem of the distribution of

cost in the repair of these automobiles between the manufacturer and the dealer, and unfortunately, quite frequently the dealer takes it in the neck in the repair of these things, even though he is forced to do it?

Mr. TOMS. This is one of the principal issues, I think, whether the dealer is repaid by the manufacturer for the work done by the dealer and at an adequate level to encourage the dealer to do that work.

Senator COOK. I think the chairman will find out this noon that that is one of the real big problems.

Mr. TOMS. We are getting reports from the consumers that they get the runaround from the dealer and we suspect the major reason is the dealer is not being properly remunerated for his work.

Senator COOK. I don't think there is any question about it.

Senator HARTKE. I want to direct your attention to section 108(b)(1) of Public Law 89–563. Bureaucratic language; right?

Mr. TOMS. Right.

Senator HARTKE. Congress specifically mandated the Secretary to establish uniform Federal motor vehicle standards applicable to all used motor vehicles. Now we are being told that instead of standards being developed, motor vehicle criteria, criteria for vehicles in use will be established in conjunction with the prototype State inspection system. I want you to explain the status of the motor vehicle in use system.

Mr. TOMS. The difference between used vehicle standards and used vehicle inspection criteria is largely semantic. We recognize the Congress' intent in the vehicles in use program. We agonized over that problem for a long, long time, and tried to develop meaningful and cost-beneficial programs to apply standards for vehicles in use. All of the data that we compiled and all of the professionals and authorities to whom we went suggested to us that the cost-benefit ratio was very poor, that the payoffs were not good.

We recognize the need to get the unsafe vehicle off the road and to do something meaningful with cars in use. As we continued to pursue this program, it was our judgment that the best program would be a vehicle inspection program operated at the State level. For this reason, we have assigned primary responsibility for our vehicles in use program to traffic safety programs, since implementation must be accomplished under the State and community part of the act.

I would also like to have Jack Goldberg make a few comments. He has been very close to the development of this program.

Mr. GOLDBERG. Mr. Chairman, I would like to address the subject first of used vehicle standards and inspection criteria.

We changed the name from used vehicle standards to inspection criteria primarily to avoid confusion with new vehicle standards whereby we have direct regulatory control over the new auto industry, and a used vehicle standard, whereby our means of implementation is basically through State inspection programs.

There was a confusion. We attempted to eliminate that confusion by addressing inspection criteria as representative of how this program will in fact be implemented. Otherwise, as far as I am concerned, a inspection criteria—and they will be for the safety critical components which we have discovered in our research, brakes, steering, suspension, and tires—will look the same, feel the same, and have the same effect as the used vehicle standards would.

Senator HARTKE. Let me explain my great concern here. There is a tendency to downgrade the so-called vehicle in use operation. I know you are going to contend that is not so.

Mr. TOMS. That isn't our intent. Our intent is to try and find the type of program that would be cost-beneficial.

Senator HARTKE. I know.

Have you conducted any cost-benefit studies?

Mr. TOMS. Yes. Definitely. As a matter of fact, Jack has been personally heavily involved in this.

Senator HARTKE. Will you submit those for the record?

(The following information was subsequently received for the record:)

COST BENEFIT STUDIES ON VEHICLES-IN-USE

Attached herewith is a copy of the recent study made by NHTSA on the subject of the relationship between vehicle inspections and fatality rates. This study concluded that there was no significant reduction in highway fatalities attributable to periodic motor vehicle inspections. This is the principal NHTSA study made on available vehicle-in-use data to date.

Periodic Motor Vehicle Inspection Effectiveness Evaluation—Two Staff Reports, May and November 1971

STAFF REPORT NO. 1—EVALUATION OF THE HYPOTHEIS THAT PMVI IS EFFECTIVE IN REDUCING HIGHWAY FATALITIES

ABSTRACT

At issue is the question whether State Periodic Motor Vehicle Inspection programs are significantly associated with a reduction in highway fatalities. Four studies have been cited as providing evidence of PMVI effectiveness in fatality reduction.

Analysis

During the 1950's, the average fatality rate of States with PMVI were significantly lower than States without PMVI. In the 1960's, the difference began to narrow and since 1966 the two rates have been essentially the same.

The claim of the superiority of State-operated inspection systems is not substantiated by available data.

For the seven States adopting PMVI between 1955 and 1965, fatality rates three years before adoption and three years following were analyzed. Individually, the States showed no distinct pattern either before or after. Collectively, the seven State average showed a slight decline prior to PMVI and a constant rate thereafter.

Conclusions

The current analysis fails to demonstrate that PMVI significantly reduces highway fatalities.

The condition of the vehicle appears to be only one of many factors influencing fatality rates and is not statistically discernible in the analysis.

The recent emphasis on comprehensive safety programs may have had an aggregate effect on fatalities, but coincidentally, the marginal effectiveness of individual countermeasures may be reduced.

A multivariate analysis should be made on the most recent data available.

EVALUATION OF THE HYPOTHESIS THAT PMVI IS EFFECTIVE IN REDUCING HIGHWAY FATALITIES

1. Background

The National Traffic and Motor Vehicle Safety Act of 1966, among other things, requires the establishment of uniform Federal motor vehicle safety standards applicable to used motor vehicles and expressed in terms of motor vehicle safety performance. The Highway Safety Act of 1966 provides a means for implementing such standards by requiring States to have highway safety programs in accordance with Federal safety standards. One of these is the PMVI standard.

The primary purpose of the periodic motor vehicle inspection safety standard, therefore, is to increase the likelihood that every vehicle operated on public highways is properly equipped and is being maintained in reasonable safe working order, thereby reducing defects or failures which cause or contribute to accidents, injuries and deaths.

II. Problem

A major question at issue is whether periodic motor vehicle inspection programs cause or are significantly associated with the reduction in the occurrence of fatalities (and if so, presumably also a reduction in injury and accident rates). Conclusions contained in four studies have provided the basis for recent claims of PMVI effectiveness in fatality reduction:

1. Mayer and Hoult, Motor Vehicle Inspection: A Report on Current Information, Measurement, and Research, 1963.—When the various States are categorized by type of inspection on a 4-point classification, there appears to be a 1) positive relationship between vehicle inspection and low highway death rates (fatalities per vehicle miles), and a 2) positive relationship between low highway death rates and inspection systems with greatest potentiality for rigour and uniformity. The State-owned inspection system is considered to be the most rigorous of all.

If between 1948 and 1960, all States had had vehicle death rates as low as those States with State-owned inspection systems, 168,381 Americans would not have died in motor vehicle accidents. Thus, it is possible to save almost 15,000 lives a year, if factors accounting for the differential can be isolated and knowledge applied throughout the United States.

Additional research is needed to refine measurement and isolate influencing factors.

2. Baxbaum and Colton, "Relationship of Motor Vehicle Inspection to Accident Mortality," The Journal of the American Medical Association, 1966.—The role of mechanical failure in automobile accidents in 1960 is examined by comparing motor vehicle mortality (per unit of population) among men, age 45 to 54, in States which do and do not require motor vehicle inspection. It is at this age that the greatest difference between white and nonwhite mortality appears.

Inspection is found to be associated with lower mortality, and this association prevails under varying conditions such as region, income, population density, vehicle registration density, and gasoline consumption. Further, comparison of white to nonwhite death rates reveals that nonwhites are at consistently greater risk. One factor of explanation is that older cars are more likely than new cars to be involved in accidents, and among car owners, nonwhites are more likely than whites to own older cars.

3. Fuchs and Leveson, "Motor Accident Mortality and Compulsory Inspection of Vehicles," The Journal of the American Medical Association, August 1967.—The relation across States between motor vehicle accident mortality and compulsory inspection is examined by regressing age-standardized highway death rates on inspection and ten other variables (such as income, education, population density and fuel consumption). The data period is 1959–61.

Inspection is negatively related to mortality, but more than two thirds of the gross differential between States that require inspection and those that do not is statistically explained by the other variables. The regression results should best be interpreted as indicating an effect of inspection in the range of 5 to 10 percent. In calculating the economic value of such effect, it is suggested that the total economic benefits might exceed the estimated costs, but the margin may not be extraordinarily large. The reduction in mortality alone is probably not sufficient to justify compulsory inspection.

4. Coverdale and Colpitts, Report on Evaluation of Motor Vehicle Inspection, 1967.—Evidence is given that fatalities per 1000 registered vehicles over the years (particularly the period 1950–1964) have had a persistent downward trend, no matter whether the fatality rate is considered for all States, States with MVI, or the non-MVI States. The condition of the vehicle is one of several factors listed as influencing this trend.

In 1964, States practicing MVI had a fatality rate nearly ten percent lower than those not practicing MVI. Assertion made that if the effect of MVI could have been brought about in all the States in that year, the number of deaths in U.S. could have been reduced by 2,700. If fatalities could be so reduced, all the other kinds of accidents also would be expected to decrease—perhaps by a half million or more out of some 13 million annual accidents.

III. Analysis

The conclusions of the foregoing studies were evaluated by two statistical approaches: (1) long-range comparisons between States, updated to the most recent data available, and (2) before-after comparisons of a State's fatality rate upon adopting a periodic motor vehicle inspection program (hereinafter called MVI).

Trend analysis

The average fatality rate of States with a MVI program was compared with the average rate of the remaining States. Since none of the four studies cited above had data subsequent to 1964, the trend analysis also served to update the statistics to the most recent figures available. Two rates were calculated: fatalities per 1,000 registered vehicles and fatalities per 100 million vehicle miles. In order to relate data more directly to the MVI program, fatalities were attributed to the State in which the victim resided rather than the State in which the accident occurred.

The results of the two rate calculations are shown in Figure 1 and 2. Both graphs reveal the same trend: during the 1950's there is a fairly constant absolute difference between the rates of States with and without MVI. About 1960 the difference begins to narrow and after 1964 the two rates converge rapidly. In 1966–67 the lines cross and remain in this reversed position through 1968, the last year data on fatalities by residence are available. As a check on the trend noted, a tabulation was made of fatalities rates using place of occurrence by mileage and registered vehicles years, although here the Staes with MVI have a fatality rate equal or just below the others. The general conclusion from the four different computations is that there is presently no significant difference between the fatality rates of States with and without MVI.

The updating of this trend analysis raises questions about the current applicability of all four studies used to justify the MVI program. Certainly the conclusion of two of the studies—Mayer and Hoult, Coverdale and Colpitts—is disputed with more recent data: simply applying the rate of MVI States to the nation as charted in Figures 1 and 2 would cause a slight increase in fatalities. The other two studies took additional factors into account, such as State income, density, fuel consumption and the age of victims, and are not clearly invalidated by a convergence of the rates. However, an updated analysis using their methodology would be in order before their conclusions can be used to justify MVI under present conditions.

A secondary conclusion of the Mayer and Hoult study was the greater effectiveness of State-operated inspections in reducing fatalities. The conclusion was examined by computing the trend in fatalities for each of the three jurisdictions with State operated inspections—New Jersey, Delaware and the District of Columbia. These trends are illustrated in Figure 5. As is obvious from the graph, the average rate of all three systems is virtually identical to that of New Jersey alone. The rates for Delaware and D.C. fluctuate markedly, and in the most recent years of 1967–68 are as likely as not to equal or exceed the fatality rate for all other States. The claim of superiority for State-operated systems is in essence based on a comparison of one highly urbanized, Northeastern State with the remainder of the country.

The conclusion that States with MVI have not had a superior record in recent years is supported by several independent analyses. For example, an analysis of mileage fatality rates for 1964–68 was made in terms of States above the national average for all five years and States below all five years. (Table 1). There was no statistically significant difference between those States without periodic inspection systems in those five years and those who had inspection throughout the period. Similarly, a multiple regression analysis of 1969 rates (registered vehicles),[1] and a rank-order correlation based on TSP ratings of compliance with the the Motor Vehicles Inspection Standard and changes in mileage fatality rates both produced no relationship of fatalities to the existence of an MVI program.[2]

An additional finding of Buxbaum and Colton was that MVI appeared to cause a greater reduction in fatalities among nonwhites than whites, presumably because the former drive older cars which are more susceptible to defects and have a higher accident involvement. This supposition is disputed in a study (Little and Hall)[3] which found that there was no relationship between vehicle age and crash involvement.

---

[1] Draft report by ARINC Research Corp., April 1971.

[2] The precise rank-order correlation, based on Kendall's tau, was —.10. The period 1967–69 was used to measure the change in fatality rates.

[3] Joseph W. Little and William K. Hall, "The Association of Accident Severity and Frequency with Vehicle Age," Accident Analysis and Prevention, May 1970.

Before-After comparison

For the seven States which adopted an MVI program between 1955 and 1965 it was possible to make a comparison of fatality rates three years immediately preceding and following the initiation of the program (Figure 6). Other States either had initiated their program before data were systematically collected or so recently that adequate "after" data is not yet available. This "before-after" comparison provided a basis for evaluating the Buxbaum and Colton finding that States adopting MVI between 1950 and 1960 experienced a 10 percent decrease in fatality rates over the 10 year period whereas States with no inspection experienced a 10 percent increase. The implication of this finding was that MVI was able to reverse a generally upward trend in fatalities.

Analysis of the seven States individually reveals no pattern either before or after adoption of MVI. The average of the seven States (dominated to some extent by New York's experience) indicates a slight decrease prior to initiation and a constant rate thereafter. The implication that these States were on an upward trend prior to MVI and a downward trend afterwards is not supported by this analysis.

If the Buxbaum and Colton finding was a valid cause-effect inference, it should obtain in the before-after comparison. It does not. It appears that their finding was strongly influenced by New York's constant downward trend throughout the decade, and cannot be used to demonstrate the effectiveness of MVI.

IV. Conclusion

Both the long-term and short-term comparisons of fatality rates fails to demonstrate any marked influence of a MVI program. If MVI is a factor, it is only one of many which affect a State's fatality record. Clearly, the foregoing analysis is not the final word on the effectiveness of MVI. The comparisons were limited only to fatalities since adequate State-by-State data was not available for items such as disabling injuries or accidents. A further limitation is the inability to determine the effect of other factors, such as income, density, or urbanization. In this respect it is important to note that the States which had MVI prior to 1960 were heavily represented in the Northeastern region while those adopting the program since then have been mainly from the Southern and Western regions where fatality rates are higher than average. This fact alone may account for the recent shift in the long-term trend. In order to take account of factors such as these a multivariate evaluation approach such as was employed by Fuchs and Leveson, should be applied to the most recent data available.

MOTOR VEHICLE FATALITIES PER 1,000 VEHICLE REGISTRATIONS
1950 - 1968

FATALITIES BY PLACE OF RESIDENCE

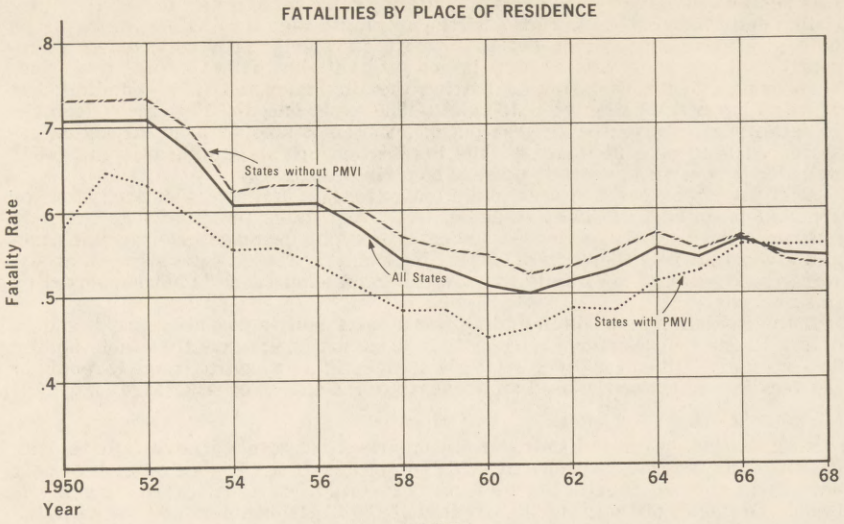


FIGURE 1

MOTOR VEHICLE FATALITIES PER 100 MILLION VEHICLE MILES
1955 - 68

FATALITIES BY PLACE OF RESIDENCE

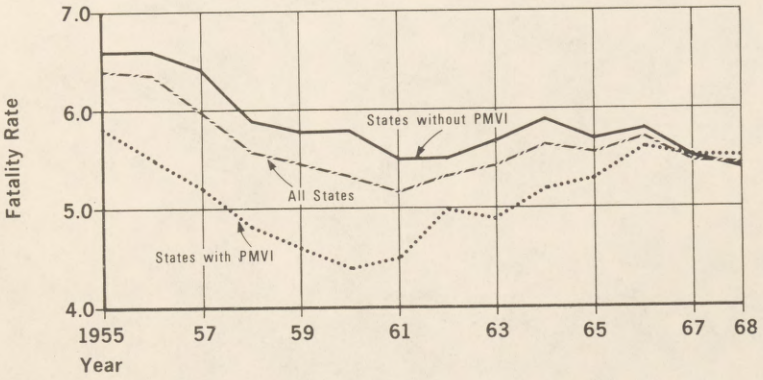


FIGURE 2

MOTOR VEHICLE FATALITIES PER 1,000 VEHICLE REGISTRATIONS 1965 - 69

FATALITIES BY PLACE OF OCCURRENCE

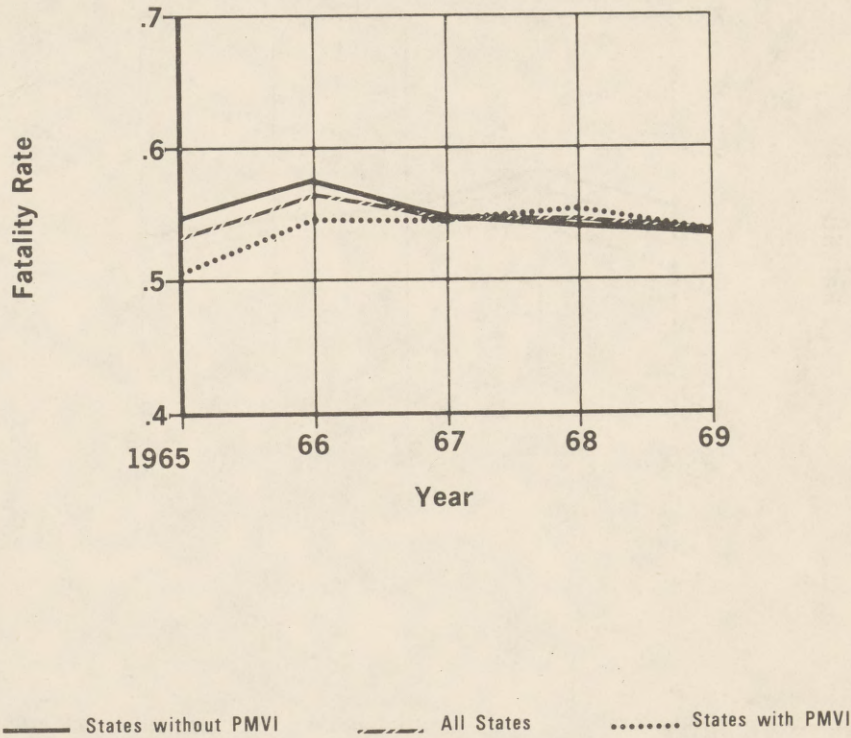


FIGURE 3

MOTOR VEHICLE FATALITIES PER 100 MILLION VEHICLE MILES 1965 - 69

FATALITIES BY PLACE OF OCCURRENCE

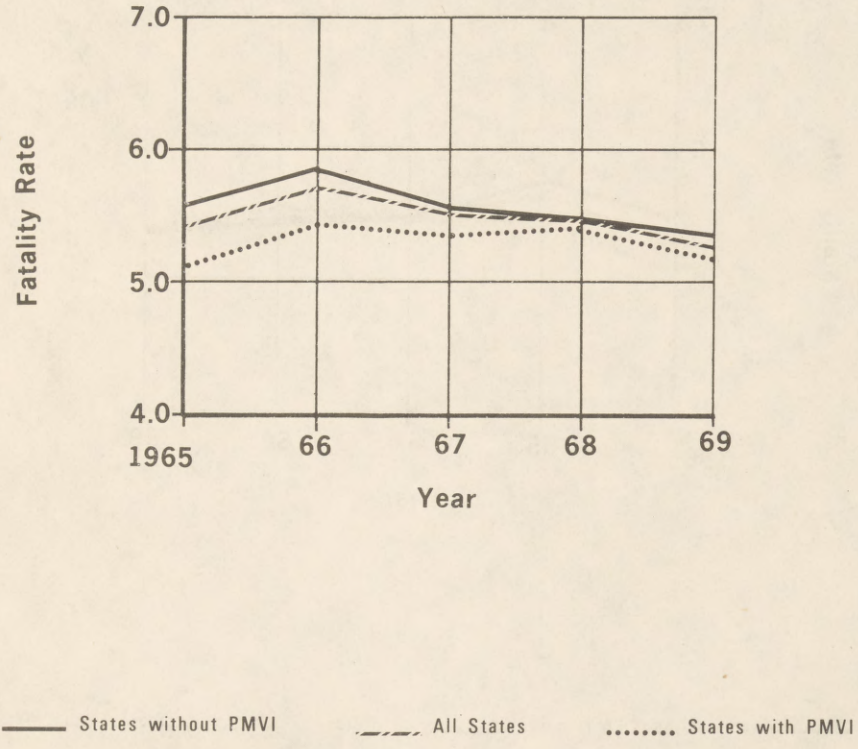


FIGURE 4

MOTOR VEHICLE FATALITIES PER 100 MILLION VEHICLE MILES
STATES WITH STATE-OPERATED SYSTEMS -
DEL., D.C. AND NEW JERSEY
1955 - 68

FATALITIES PER PLACE OF RESIDENCE

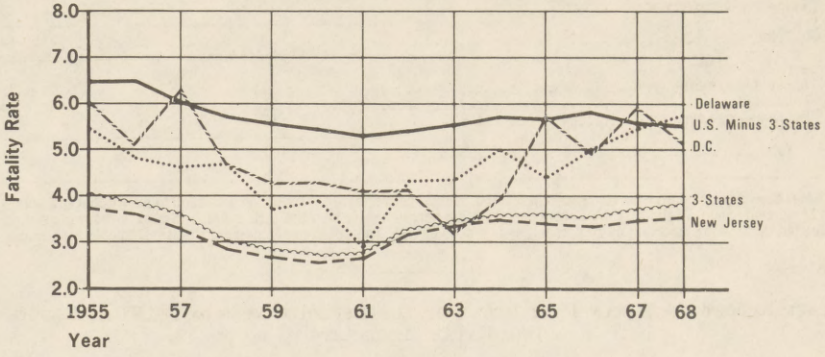


FIGURE 5

PMVI PAYS

Examples

Mayer and Hoult (Wayne State University), 1963.—If * * * all States had death rates as low as those with State operated * * * systems—168,381 Americans would not have died—(12 yr period) 15,000/yr saving

Buxbaum and Colton, 1966.— Inspection is associated with lower mortality—death rates fell * * * 10% * * * in States began inspection 1950 * * * 1960 * * * rose 10% * * * in States which did not * * *

Fuchs and Levinson, 1967.—Inspection reduces * * * mortality * * * by from 5 to 10% * * *

Coverdale and Colpitts, 1967.—Those States practicing * * * inspection * * * fatality rate—10% lower * * * than States not practicing * * *

TABLE 1.—COMPARISON OF 19 STATES THAT HAD STATE INSPECTION REQUIREMENTS AND 25 STATES HAVING NO INSPECTION REQUIREMENTS THROUGHOUT THE 5-YEAR PERIOD 1964–68 IN TERMS OF THE U.S. AVERAGE VEHICLE MILEAGE FATALITY RATES FOR THE SAME PERIOD

Compared with U.S. fatality rate	Inspection status		
	Yes	No	Total
Number:			
Above average every year	5	9	14
Fluctuated	4	7	11
Below average every year	10	9	19
Total	19	25	44
Percent:			
Above average ever year	26	36	32
Fluctuated	21	28	25
Below average ever year	53	36	43
Total	100	100	100

Note: Considering relative percentages below the U.S. average, States with inspection exceeded those without inspection by 17 percent, or in a ratio of 1.47. Considering relative percentages above the U.S. average, States without inspection exceeded those with inspection by 10 percent, or in a ratio of 1.38. The difference in percent is not statistically significant

STAFF REPORT NO. 2—AN EVALUATION OF THE EFFECTIVENESS OF PMVI IN REDUCING FATAL ACCIDENTS

ABSTRACT

This paper estimates the probable effectiveness of PMVI in reducing fatal accidents. Effectiveness estimates are made via two independent analyses: (1) multiple regression which attempts to relate PMVI and other variables to a reduction in fatality rates, and (2) research results indicating the influence of PMVI on defect levels in a State's vehicle population. The results of these analyses are then used to make a cost-effectiveness comparison between a random inspection system (California) and a PMVI system which is felt to be among the most effective (Pennsylvania). Recommendations are made for further research and analyses.

Evaluating the effectiveness of PMVI

Studies on the effectiveness of PMVI as a highway safety countermeasure have employed one of two basic approaches. The more simple of these has been to investigate the direct relationship between the existence of a PMVI program and a State's fatality rate and estimate the extent to which a lower fatality rate can be attributed to inspection. The preferred technique for establishing this relationship is multiple regression analysis. The main criticism of this type of analysis is the difficulty in accounting for all the other factors besides PMVI which can influence the fatality rate. The other approach is less ambitious but more precise: measure the effect of PMVI on the mechanical quality of a State's vehicle population with the ultimate safety payoff in accident reduction only implied.

Both approaches to analysis provide information which can be useful in estimating the effectiveness of PMVI in reducing fatalities and the total societal costs of traffic accidents. Surveys of the mechanical quality of vehicles of States with and without PMVI give a good measure of the direct program output of PMVI and, assuming that defect-caused accidents are reduced to the same degree that defects are reduced, a means for linking PMVI to a reduction in accidents caused by mechanical failure.[1] The regression analyses, in turn, provide a gross measure of total fatality reduction which can be compared with some of the inferences drawn from the surveys of mechanical quality. Since neither approach has as yet provided reliable data linking PMVI to a reduction in accidents, this paper will utilize the results of studies from both methods and make some reasonable inferences of program effectiveness based on the totality of the best information available.

[1] This approach follows the general philosophy set forth in "Causal Chain Approaches to the Evaluation of Highway Safety Countermeasures," by William K. Hall and James O'Day. Presented at ORSA meeting, April 1970, Washington, D.C.

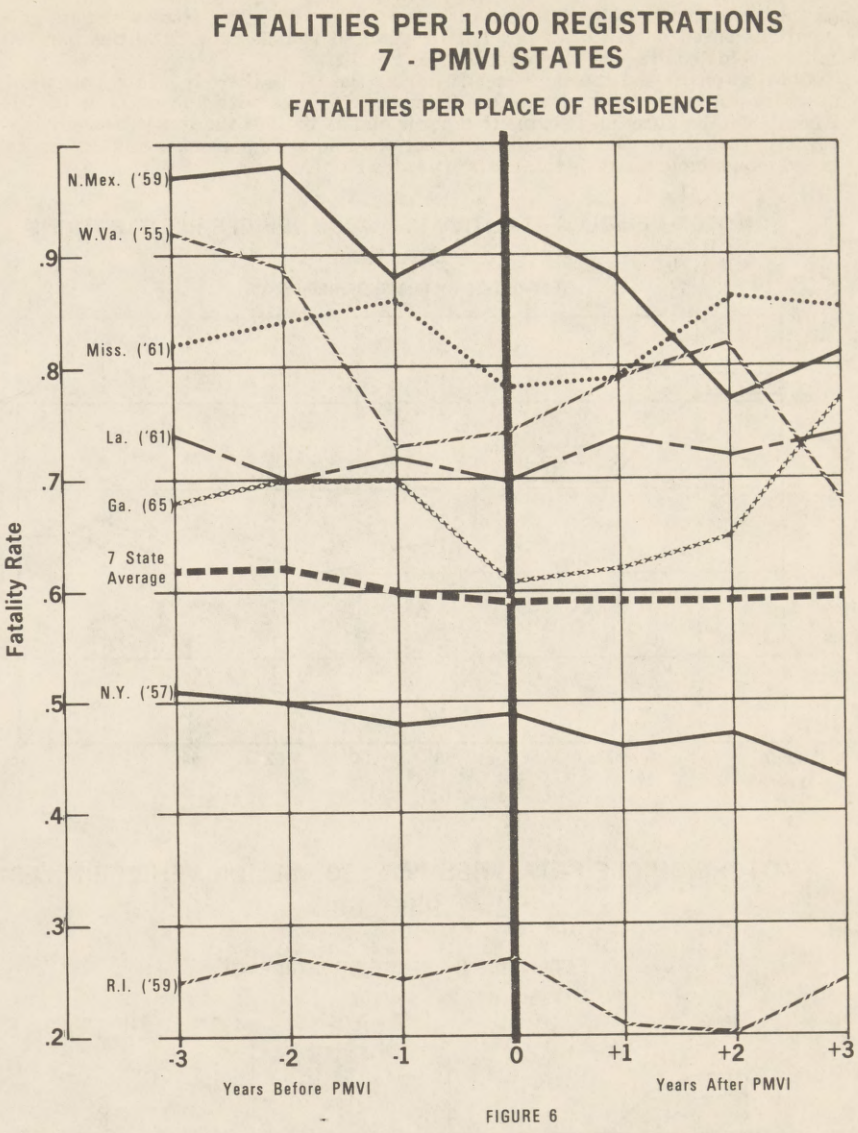


FIGURE 6

1. PMVI and fatality rates

A simple analysis of fatality rates of States with and without PMVI indicates that there is presently no significant difference. Several studies which had looked at these rates prior to 1965 had found that States with PMVI had consistently lower fatality rates.[2] Based on these comparisons one study claimed that as many as 2,700 additional lives could be saved annually if all States had PMVI; the other claimed a potential of almost 15,000 lives saved.

A recent analysis which updated the comparison between States with and without PMVI has called these estimates into question. First, this analysis demonstrated that whatever differences in fatality rates were in existence

[2] Albert J. Mayer and Thomas F. Hault, "Motor Vehicle Inspection : A Report on Current Information, Measurement and Research," Institute for Regional and Urban Studies, Wayne State University, 1963 and "Report and the Evaluation of Motor Vehicle Inspection," Coverdale and Culpitts, 1967.

in the period from 1950–1964 had disappeared by 1966. The results of rate calculations based on fatalities per 1,000 registered vehicles and fatalities per 100 million vehicle miles are shown in Figures 1 and 2.

Both graphs reveal the same trend; during the 1950's there is a fairly constant absolute difference between the fatality rates of States with and without PMVI. About 1960 the difference begins to narrow and after 1964 the two rates converge rapidly. It appears that it is currently not possible to demonstrate any difference based on a simple analysis total fatality rates alone.

MOTOR VEHICLE FATALITIES PER 1,000 VEHICLE REGISTRATIONS
1950 - 1968

FATALITIES BY PLACE OF RESIDENCE

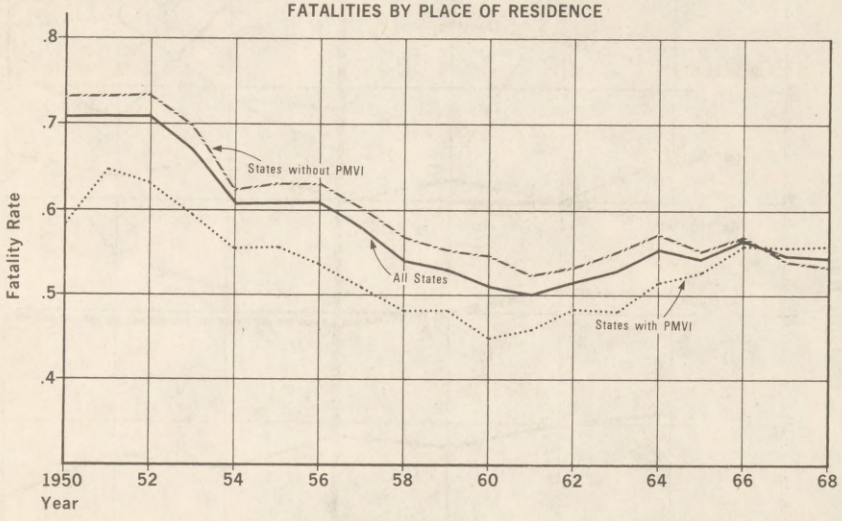


FIGURE 1

MOTOR VEHICLE FATALITIES PER 100 MILLION VEHICLE MILES
1955 - 68

FATALITIES BY PLACE OF RESIDENCE

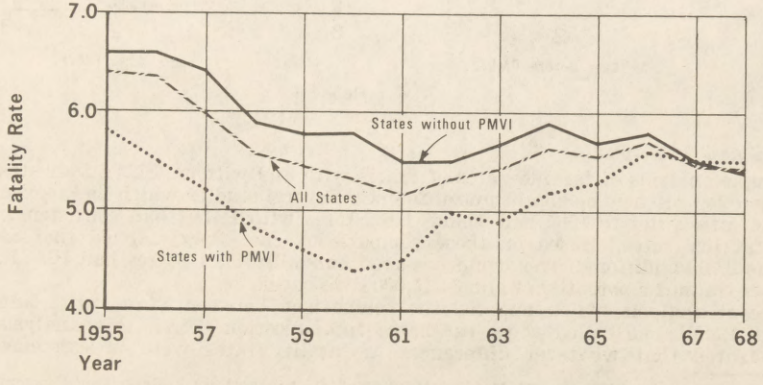


FIGURE 2

Two other published studies have gone a step further and evaluated the effect of PMVI on fatality rates while controlling for other relevant variables. One of these studies [3] examined the 1960 vehicle mortality rates of men age 45–54 and found that comparing States with comparable per capita income, population density and percent urban population that States with PMVI consistently had lower mortality rates. Another study [4] analyzed the average motor vehicle fatality rate for 1959–61 by means of multiple regression analysis and concluded that the results indicated a probable reduction of 5 percent to 10 percent in the fatality rate due to PMVI. Since both of these studies used data prior to the convergence of fatality rates for PMVI and non-PMVI States in the mid-1960's, an updated multiple regression analysis was conducted using 1968 data.

The procedure used was a stepwise regression which allows independent variables to be added in order of their importance for the dependent variable. The following independent variables were used in the analysis:

Income (average per capita income in 1968). This variable is a proxy measure for economic conditions and socioeconomic status, both of which have been previously associated with fatalities.

Percent white. Adjusts for the presumed higher fatality rate among nonwhites.

Other accidents (the mortality rate per 10,000 population for non-motor vehicle accidents in 1968). Fuchs and Leveson found this variable to be significantly related to vehicle fatalities.

Inspection (A dummy variable. States which had inspected all vehicles prior to Jan. 1, 1968 were given a 1; States without inspection were given a 0. Five States (Florida, Idaho, Kentucky, South Dakota and Wyoming) which began inspection in either 1967 or 1968 were omitted from the analysis because all vehicles had not been inspected by Jan. 1.

Rural-urban travel (the ratio of rural vehicle miles driven to urban vehicle miles). This variable adjusts for the higher fatality rate in rural areas.

Alcohol consumption per capita (estimated alcohol consumption in wine gallons—1968).

The last two variables—rural-urban travel and alcohol consumption—were not significantly related (at the .95 level of confidence) to the dependent variable and were not included in the regression computations.

Table 1 contains three measures of the relationship of the independent variables to States' fatality rate. The partial correlation coefficient indicates the correlation of each independent variable when the effects of the other independent variables are controlled. The beta coefficients indicate the relative importance of each independent variable in affecting the fatality rate when the effects of all other independent variables are included. The last column indicates the incremental variation explained after the more significant variables have been included. For example, "per capita income"is the most important variable—explaining 42 percent of the variation in fatality rates by itself. After the income effect has been accounted for, "percent white" accounts for an additional 5 percent; then "other accident mortality" accounts for 8 percent, and after these three variables have been controlled for inspection accounts for an additional 2 percent of the variation.

It is important to note that both the 1959–61 and the 1968 data show that nonprogram factors account for a much larger portion of fatality rate variation than does vehicle inspection. In the 1959–61 analyses more than two-thirds of the variation was explained by variables other than inspection; in the 1968 analyses the comparable figure is about 55 percent. Because of the importance of non-program variables, it should not be expected that PMVI (or any other current accident avoidance program) would reveal anything better than a small reduction in total fatality rates.

Although the results of the two multiple regression analyses provide only an approximation of the effects of PMVI, both indicate a small but positive effect in reducing fatalities. It is evident that if effects of this small magnitude are obtained after controlling for demographic and social variables they would probably be obscured in a simple comparison of fatality rates. The results of the two multiple regression analyses are therefore not inconsistent with the finding that fatality rates of States with and without PMVI indicates no significant difference.

---

[3] "Evaluation of the Hypothesis that PMVI is Effective in Reducing Highway Fatalities," NHTSA staff paper, May 1971.

[4] Robert C. Buxbaum and Theodore Colton, "Relationship of Motor Vehicle Inspection to Accident Mortality," Journal of the American Medical Association, July 1966.

TABLE 1.—RESULTS OF MULTIPLE REGRESSION ON FATALITY RATE BY STATE OF RESIDENCE PER 100,000,000 VEHICLE MILES

Variable	I—Partial correlation coefficient	II—Beta coefficient	III—Incremental variation explained
Per capita income	−0.52	−0.45	0.42
Percent white	−.47	−.36	.05
Mortality rate—Nonvehicle accidents	.39	.31	.08
PMVI	−.26	−.17	.02

PMVI and mechanical quality of vehicles

Two studies have investigated the mechanical quality of vehicles under different types of inspection systems. The first of these studies,[5] conducted by researchers at HSRI, compared the defect rates of vehicles in Cincinnati (two inspections per year), Washington, D.C., (one inspection per year) and Ann Arbor (random inspection). The results from each city are not completely comparable since the Cincinnati and Washington data were obtained from vehicles as they came in for inspection, while the Ann Arbor vehicles were secured at random from street traffic. Nonetheless, the magnitude of differences in defect levels between the PMVI cities and Ann Arbor were significant. 3.0 percent of all components tested in Cincinnati were defective, 5.1 percent in Washington and 15.8 percent in Ann Arbor, indicating substantial differences in mechanical quality between areas with and without PMVI.

Inspections per year	Percent of components judged defective	
	HSRI	Ultrasystems
Random (Ann Arbor/Calif.)	15.8	9.7
1 (Washington, D.C./New Jersey)	5.1	8.5
2 (Cincinnatti/Penn.)	3.0	6.2

A study employing more elaborate experimental controls was recently completed by Ultrasystems, Inc., under a NHTSA contract.[6] This study analyzed the results of in-depth inspections of comparable samples of automobiles in 3 States and confirmed that safety-related defect levels are lower in PMVI States, although the differences in the percent defective were not as great as in the HSRI study. In Pennsylvania (2 inspections per year) 6.2 percent of components related to safety were found defective, in New Jersey (one inspection per year), 8.5 percent and in California (random inspection) 9.7 percent. This three-State study included a number of reliability checks and its results can be accepted with a high degree of confidence. It seems clear that in the locations sampled to date PMVI results in an improved mechanical quality level for the vehicle population.

The relationship between defects and defect-caused fatal accidents

The example that follows attempts to indicate how significant the differences in defect levels found in the Ultrasystems study might be in terms of fatal accidents avoided. The basic assumption of the analysis is that the proportion of all fatal accidents which are caused by defects is directly related to the percentage of safety-related components which are judged defective. This assumption could be tested by examining the defect rates in States with and without PMVI and determining the proportion of fatal accidents in each State caused by defects. NHTSA is undertaking research which will provide data pertinent to this problem but results will not be available for a year or more. In lieu of this more inclusive information, the assumption of a direct relationship between defect rates and the proportion of fatal accidents caused by defects appears to be a reasonable analytical assumption in a vehicle population. However, neither of the two studies make inferences concerning a relationship between the observed defect levels and consequent reduction in accidents, so a major issue remaining to be examined

[5] Victor R. Fuchs and Irving Leveson, "Motor Accident Mortality and Compulsory Inspection of Vehicles," Journal of the American Medical Association, August 1967.

[6] Robert W. McCutcheon and Harold W. Sherman, "The Influence of Periodic Motor Vehicle Inspection on Mechanical Condition," Journal of Safety Research, December 1969.

is how this improvement in defect rates might affect the ultimate payoff in accident avoidance and, further, is this payoff large enough to justify the cost involved in maintaining the program.

The procedure used will be to determine the statistical relationship between the defect rate and defect caused fatal accidents in a State (California) without PWVI and using the following formula estimate the proportion of fatal accidents caused by defects in a State with PMVI (Pennsylvania).

$$\frac{\text{Percent of all fatal accidents caused by defects (California)}}{\text{Percent of safety-related components judged defective}} = \frac{\text{Percent of all fatal accidents caused by defects (Pennsylvania)}}{\text{Percent of safety-related components judged defective}}$$

The effectiveness of PMVI will be estimated by comparing the number of defect caused fatal accidents which did occur in Pennsylvania with a number estimated to have occurred if Pennsylvania had a defect as high as California's.

Based on a study by the California Highway Patrol an estimate was made of the proportion of fatal accidents in that State in which mechanical defects were involved. In that study a sample of rural single-vehicle non-pedestrian fatal accidents it was estimated that 6.6 percent were "caused by mechanical failure and in another 11.7 percent defects were a contributing factor—a total of 18.3 with defect involvement. Since the type of accidents in the California sample constitutes only 30 percent of all fatal accidents and additionally, are characterized by high speeds which would increase the severity of an accident when a defect occurred, the 18.3 percent figure would result in a large overestimate of proportion of all fatal accidents caused by defects. For this reason, estimates of the proportion of fatal accidents caused by defects were made by applying the 18.3 percent findings to all rural single vehicle, non-pedestrian fatal accidents and two estimates—9 percent and 4.5 percent—for the remaining 70 percent of fatal accidents. (Table 2). From this procedure it is estimated that the proportion of all fatal accidents in California caused by defects falls within a range of 8.7 percent to 11.8 percent.

The proportion of defect-caused fatal accidents in Pennsylvania is estimated to be 5.5–7.5 percent. Compared to the California estimates this constitutes 3.2 to 4.3 percent reduction in the States's fatality rate or an estimated 67–97 fatal accidents avoided annually. The results of this analysis therefore falls within the range of estimates derived from multiple regressions analyses. Comparisons of the three separate analyses as they would relate to Pennsylvania's 1970 fatal accident experience.

	Estimated reduction in total fatality rate (percent)	Estimated fatal accidents avoided
Multiple regression (1959–61 data)	5–10	98–197
Defect rate analysis	3.2–4.3	67–97
Multiple regression (1968 data)	2	39

TABLE 2

	Proportion of all fatal accidents		Assumed rates of defect involvement		Defect involvement as a proportion of all fatal accident
High estimate:					
Rural, single-vehicle pedestrian	0.30	×	0.183	=	0.055
Other fatals	.70	×	.09	=	.063
Total					.118
Low estimate:					
Rural, single-vehicle pedestrian	.30	×	.183	=	.055
Other fatals	.70	×	.045	=	.032
Total					.087

Cost effectiveness implications

In the foregoing analysis, Pennsylvania's PMVI system was compared with California's random inspection system. While it appears that PMVI results in additional lives saved, it is also true that the PMVI system requires much greater costs to operate. For example, in 1970 California inspected 1.2 million vehicles while Pennsylvania performed two inspections on each of 5.7 million vehicles. For this reason, cost estimates are important for comparing PMVI to random inspection or other accident avoidance countermeasures in terms of cost to society for each fatal accident avoided.

The cost of operating an inspection program falls into four categories:

1. Cost to the State for administering and monitoring the system.
2. Operating costs of inspectors' salaries, equipment, overhead and depreciation.
3. Cost to the public for time and travel to and from inspection.
4. Additional repair cost and condemnation losses due to inspection.

The estimated 1970 costs for the inspection system in Pennsylvania are estimated at $87.3 million. For California's random inspection system the estimated cost is $5.0 million. Table 3 provides the cost breakdown by each cost category.

TABLE 3.—ESTIMATED COST OF INSPECTION SYSTEMS, 1970

[In thousands]

	California (random)	Pennsylvania (2 inspections per year)
Administrative	[1] $3,200	[2] $800
Operating		[3] 46,000
Time and travel	[4] 600	[5] 26,500
Repair and condemnation	[6] 1,200	[7] 14,000
Total	5,000	87,300

[1] State of California estimate covering both operation and administration.
[2] Based on estimated costs of 67 State police offices, monitoring inspection stations and $120,000 to train inspectors.
[3] Based on estimated $4 per inspection.
[4] Based on estimated 15 minutes per inspection, with time costs valued at $2 per hour. No travel costs involved.
[5] Based on estimated 1 hour and 3 miles travelled per inspection.
[6] Based on estimated average of $1 per inspection.
[7] Based on estimated $1 per inspection in added repairs and condemnation of 100,000 vehicles at $25 in lost value per vehicle.

Since the estimated cost difference between the two systems is $82.3 million, the cost per additional fatal accident avoided through PMVI is approximately $1.2 million for 67 accidents involved (Low Estimate) and $850,000 for 97 accidents avoided (High Estimate).

From the estimated cost of the Pennsylvania PMVI system it is possible to compute a breakeven point, i.e., that percentage reduction in all types of accidents at which the benefits of PMVI would just equal cost. It has been estimated that the cost to society of each fatal accident is $250,000 and that fatal accident costs comprise 24 percent of total accident costs. From these figures the total accident cost for Pennsylvania in 1970 is estimated to be approximately $2 billion. In order to derive benefits equal to its $82.3 million cost, the PMVI system in Pennsylvania would have to reduce all types of accidents by 4.1 percent.

Recommendations for further research and analysis

This paper has attempted to estimate the effectiveness of PMVI in reducing fatal accidents and the social cost involved from the avoidance of accidents in general. Because of the limitations in data and problems in attributing accidents to mechanical failures, the results obtained should not be regarded as anything other than a rough estimate of the general magnitude of PMVI effectiveness. The analysis does, however, highlight the areas where more reliable data could produce a more conclusive analysis. Specifically, a research plan should obtain data for each of the two types of evaluation employed in this paper: (1) estab-

lish the relationship between the existence of PMVI and a State's fatality or accident rates, and (2) establish the causal link between inspection and defect rates and between defect rates and defect causation in accidents.

1. Establishing the direct relationship between PMVI and accidents and fatalities

Although the results of the multiple regression analyses have been used to estimate the general magnitude of PMVI effects, further use of this technique would not contribute significantly to improved estimations. As analyses of both the 1960 and 1968 data revealed, non-program factors, such as income, account for most of the explained variation in fatality rates. For this reason, it would be expected that analysis of additional years' data would yield a PMVI coefficient which accounted for about 5 percent or less of the total variation. Even though this is a small range in absolute terms, in relative terms estimates of benefits could vary by a factor of 5:1. Since the breakeven point for PMVI in benefit-cost terms is 3–4 percent, it is obvious that multiple regression techniques have limited value for further refining estimates of effectiveness useful for decision-making on a benefit-cost basis.

A desirable alternative to multiple regression analyses would be to randomly select a sample of vehicles for inspection and compare the sample's accident, injury and fatality experience with non-inspected vehicles. This type of design could be implemented in a State initiating a PMVI program which scheduled initial inspections by a random procedure such as last digit on the license plate. This design would eliminate the influence of other variables (environment, driver characteristics, etc) and would be simple and inexpensive to undertake. The only weakness in this approach is that it would only evaluate the effect of one State's system and would be impossible for States already inspecting. For the States which currently have PMVI, the causal chain approach relating defect rates to defect causation of accident is recommended.

2. Establishing the link between PMVI and defect rates and defect-caused accidents

As a follow-up to the Ultrasystems study, NHTSA is currently preparing for a research project which will determine the defect rate for vehicles in 6 additional States. This project will examine the influence of different inspection systems, urban and suburban and rural residence, topography and climate on defect rates. This research should provide highly reliable data on the relationship between inspection systems and defect rates. In addition a study in Bloomington, Indiana involving 50 percent of all accidents, randomly selected, will determine the extent to which defects are involved in accident causation while also surveying the defect rates in the city's vehicle population. These two studies taken together should provide a stronger empirical base for establishing the causal chain relationship between inspections, defects and accidents. Further research undertaken should couple measurement of defect rates with estimates in the same locations of defect-caused accidents. If the relationship between these two measurements can be obtained in enough areas, it would eventually be possible to accurately estimate the safety payoff of PMVI systems by periodically checking defect level in a State's vehicle population.

Senator HARTKE. I want to come back to one other item, and I don't think there is any use in pursuing it any further at this moment. But it says that one-fifth of the total fatalities on the highways today are a result of mechanical defects in used automobiles.

Now, if that is true, if we could eliminate it, that would save 12,000 lives 1 year alone.

Mr. TOMS. That is an estimate on the high side. There are dozens of studies and they show a range from one-fifth down to about one-twentieth. I think that tires are particularly critical. They may range almost up to a fifth. But there is always more than one cause of a crash. Therefore, I don't think that if we were to implement this program and

could properly isolate this as a crash factor, Mr. Chairman, that this would reduce a fifth of the fatalities.

Senator COOK. I wonder when you are going to start proposing standards relative to the vehicle that comes off the line and meets all of the standards and it gets into a garage and all of a sudden, it looks like a horrendous edition of what it was supposed to look like, and is so totally and completely removed from all standards, all heights, all dimensions, as to constitute in itself an unsafe vehicle on a highway.

Mr. SCHNEIDER. Senator Cook, as we mentioned briefly last Wednesday when we appeared before you, the way we are presently addressing it is through our authority under the Highway Safety Act, the other basic statute that we administer. We are going to the States and proposing, "As part of your State program for which you receive Federal funds, you have to have a law that prohibits the alteration of a vehicle by anyone so that it adversely affects that car's ability to comply with the standards that are applicable to it."

Senator COOK. How much have you really moved in that direction?

Mr. SCHNEIDER. Well, we are issuing a notice in the Federal Register. I thought it was going to be published on Thursday, but it won't appear until August 3d's Federal Register.

Senator COOK. I wish that you would hurry up and move in this direction, because every once in a while you will see a car come flying by you that is about 3 feet high in the rear end and 3 inches off the ground in the front. It has tires on it that ought to be at Indianapolis and it goes flying by you, and you know, there is no way that we can honestly prescribe to a manufacturer the standards he has to meet, coming off the end of the line, and then to do absolutely nothing about what happens to that vehicle once it leaves the line.

It seems to me that it is a total inconsistency. And yet we have watched the parts industry in the United States, and many of these parts are manufactured by the very same people that manufacture the automobiles—and all you have to do is go down to any automobile parts establishment and you can lower the front end, you can raise the rear end, you can take everything off, you can put everything on—and it is just not even anything similar to the basic standards that you are attempting to establish for the safety of somebody else, not only the safety of the individual himself.

There are some automobiles on the road today which a Volkswagen wouldn't hit the bottom of that car until it got halfway up the bottom frame.

Mr. TOMS. Senator, you are zeroing in on a crucial issue. I think all of us here recognize how difficult it is to determine what degree of modifications is unsafe. We are at work trying to determine beyond what point the vehicle becomes unsafe when it is raked, chopped, or whatever. With the wide variety of vehicles and suspension systems this is very difficult. The Congress ought to give some thought as to how they want to approach this problem. You know, there is a very sizable aftermarket industry in the United States, indeed worldwide. There are a lot of people who like to customize their automobile or add different types of parts or components to the vehicle.

You may have read just recently that a representative of GM made a study about tachometers and add-on instrumentation on the interior of the automobile and how this degraded the performance of collapsi-

ble steering columns. Well, the question being begged is, should we get to a point where we can say to the consumer, you can't add a tachometer, an ammeter or any kind of accessories to your automobile? If we get to that point, I think that a lot of people will indeed be sad. I think the better approach is for the Government to try to determine which modifications are unsafe. But this is a tough job.

Senator COOK. The only thing that bothers me is the outside modifications that make that automobile totally and completely unsafe in its relationship to the other automobiles on the highway.

Now, we sat here last year and we saw all kinds of films on how everybody had to establish standard heights for bumpers so that you could have bumper-to-bumper crashes. You are talking about a 5-mile-an-hour bumper. You are talking about rear bumpers. And then we allow modifications of automobiles so the bumpers wouldn't any more meet than the man in the moon.

Mr. TOMS. States have——

Senator COOK. And you have some motorcycles, by the way, that the front wheel goes around the corner before the rest of it.

Mr. TOMS (continuing). That is right. These vehicles concern us. Many States have bumper height laws which would be a part of our vehicle-use program.

Senator HARTKE. Two quick questions. On July 15 you received a letter from a doctor in New Jersey regarding a 5-year-old boy who closed an electric window on his neck, strangling and killing him. What are you doing to promote standards for electric windows which could prevent this type of accident?

Mr. TOMS. I am not personally familiar with that case. But we do have——

Senator HARTKE. You received the letter.

Mr. TOMS (continuing). Well, I guess I am just not personally acquainted with that letter.

Senator HARTKE. Do you know what I am talking about?

Mr. TOMS. Yes, I understand the type of problem you have described. We have been working on techniques that would enable an electric window to sense the presence of an obstructing object and return to the open position.

I was just looking at Bob to find out exactly the status of that rule. He says he doesn't recall from memory. But I know that we have had a number of our engineers working on it.

There has been a considerable amount of internal communication on it. I don't know whether the problem is the cost or the lack of technology, but it is something on which we have been working hard.

Senator HARTKE. An old item which I can never understand why Congress could not adopt, is criminal sanctions. This administration tells me they support the concept of law and order. If I were walking down the street and without justification somebody hit me over the head and took my wallet, he would be sent to jail. But if a manufacturer knowingly produces a vehicle which could injury, maim or kill a person on the highway, why shouldn't he be subject to the same criminal sanctions?

Mr. TOMS. This has been discussed a good bit, Mr. Chairman.

Senator HARTKE. Discussed? I have put it on the floor and gotten beat every time. Why?

Mr. TOMS. I don't know why. I know that there are a lot of people who believe that they are sincere in attempting to——

Senator HARTKE. If a man sincerely wants to put a vehicle out on the highways that he knows is going to kill me, that type of sincerity I can do without.

Mr. TOMS (continuing). I guess most of the auto industry would say that they don't do that.

Senator HARTKE. I would hope that you would come back with strong recommendations along this line. I hope you can convince the President to support criminal sanction provisions.

The hydraulic fluid standards were adopted before the 1966 act so when we put the safety bill together, we included the hydraulic fluid section into the overall bill. The hydraulic fluid section had a provision that if somebody knowingly put water into that fluid, he was guilty of a criminal act. Now, you can put water into it, and it will make no difference. You are still not subject to criminal sanctions. Correct?

Mr. TOMS. There has been water in hydraulic fluid in recent years.

Senator HARTKE. Fine. At present there is no Federal motor vehicle safety standard for vehicle handling; is that correct?

Mr. TOMS. That is correct.

Senator HARTKE. Why not?

Mr. TOMS. We do not know how yet.

Senator HARTKE. Are you satisfied?

Mr. TOMS. Certainly not. We want one. We have hired some new engineers attempting to determine how this should be done. We, in fact, have engineers in Europe now working on some studies to try to document what we should do in this category and we have determined that it is cost beneficial.

Senator HARTKE. Are those the Highway Safety Research Institute contracts?

Mr. TOMS. They have been involved in it, yes.

Senator HARTKE. Have they fulfilled their contracts yet?

Mr. TOMS. They have fulfilled some of them. I think that there are still several outstanding.

Senator HARTKE. Do you have a time when you anticipate to promulgate handling standards for all vehicles?

Mr. TOMS. Yes.

Senator HARTKE. When?

Mr. TOMS. That is in our motor vehicle program plan. It would be my hope that perhaps within the next 6 months to a year an NPRM would be published.

Senator HARTKE. What was the total cost of the Corvair's stability and handling defect investigation?

Mr. TOMS. We will submit that information for the record, Mr. Chairman.

Senator HARTKE. You do not know?

Mr. TOMS. I don't know the exact——

(The following information was subsequently received for the record:)

The total cost of this investigation is approximately $480,000.

Senator HARTKE. That contract was given to Texas Transportation Institute; is that correct?

Mr. TOMS. That is correct.

Senator HARTKE. Why was it given to them? Did they have previous experience in vehicle dynamic research? Was there competitive bidding?

Mr. TOMS. They had a good reputation in the field and, of course, as you know, we go to bid——

Senator HARTKE. You did not go to bid?

Mr. TOMS. We did go to bid.

Senator HARTKE. There was not a competitive bid. Why not?

Mr. TOMS. I think it was competitively bid.

Senator HARTKE. I don't think it was.

Would you like to reserve judgment on that and supply it for the record, why it was not?

Mr. TOMS. I thought it was.

Senator HARTKE. All right. I think you will find out it was not. Will you just supply for the record why not?

Mr. TOMS. I would be pleased to.

(The following information was subsequently received for the record:)

The input-response test program required several unique conditions for satisfactory performance. A site essentially independent of the motor vehicle manufacturers was desired. Further, this type of dynamic vehicle testing required a large test track complete with supporting instrumentation and service facilities. Several sites were considered; among them were the Cornell Aeronautical Laboratory, Inc., Buffalo, New York, the University of Michigan (Detroit Willow Run Airport), the Bendix Providing Grounds, South Bend, Indiana, and the Texas Transportation Institute (TTI), College Station, Texas. TTI was the only one that satisfied the necessary conditions and the contract was therefore negotiated.

Senator HARTKE. Has Texas Transportation Institute done any contractual work for General Motors?

Mr. TOMS. This I do not know personally.

Frank, do you know?

This is Frank Berndt, our special attorney on Convairs.

Senator COOK. Is that the offensive team moving back and the defensive team moving up?

Mr. TOMS. That's right. We are employing the two platoon system this morning, Senator Cook.

Mr. BERNDT. I might just note, Mr. Chairman, that we did have the contract with Texas, but that it was under the control of our own engineers. They moved down there and they lived down there and ran the whole show.

Senator COOK. Do you have the figures on it, the cost figures?

Mr. BERNDT. No.

Mr. TOMS. We can supply them for the record.

(The following information was subsequently received for the record:)

The cost of the Texas Transportation Institute (TTI) contract was $271,163.20. An additional cost for purchase of vehicles and tires not paid to TTI was $6,177.59.

Senator HARTKE. Did you check to see whether TTI had ever done any work for GM?

Mr. TOMS. It would be my assumption that we did check it. I can't say at this minute absolutely that that determination was made.

Senator HARTKE. Do you know why they had never done any work for them?

Mr. TOMS. Coincidence.

Senator HARTKE. Why were all the tests conducted on a high coefficient dry pavement?

Mr. TOMS. They were done at high coefficient pavement because this condition aggravates the rollover characteristic.

Senator HARTKE. Shouldn't you have used various types of pavement?

Mr. TOMS. The most severe condition is the high coefficient pavement. Obviously, on a lake with a low coefficient, you will just slide.

Senator HARTKE. You should?

Mr. TOMS. Yes. In other words, unless you hit a rut or a crack in the ice, you know, you can't roll a car over on ice.

Senator HARTKE. What year was Corvair used?

Mr. TOMS. 1963.

Senator HARTKE. Why were not earlier models, 1960 and 1961 used? They were the ones that had a higher incidence of rollover.

Mr. TOMS. No. As a matter of fact, Mr. Nader has an authorized or designated representative who suggested the 1963.

Senator HARTKE. He will be here in a minute. We will ask him.

Mr. TOMS. Please do. As we debated this matter we came to decide that the 1963 was the one that would be most characteristic for this type of testing.

Senator HARTKE. What type of tires were used on the Corvair test?

Mr. TOMS. They were the tires available in the market that were closest to the original specifications of the manufacturer.

Senator HARTKE. Did they differ substantially in the make or tread style material from those which came with the original Corvair?

Mr. TOMS. There were differences, but my engineers had told me these differences were not significant.

Mr. BERNDT. With respect to the tires, Mr. Chairman, the tires were recommended by the manufacturers of each vehicle that was tested as those most nearly representative of the tires on the original models.

Senator HARTKE. Did all the vehicles that were tested represent the manufacturers' maximum recommended load?

Mr. TOMS. That is correct.

Senator HARTKE. Why?

Mr. TOMS. Because, number one, again, Mr. Nader's representative suggested that we test them in a fully loaded condition. Number two, the type of instrumentation on the controllers of these vehicles was heavy. In general, it was close to the equivalent of a fully loaded vehicle.

Senator HARTKE. One of the people who you worked with is Mr. Sellers; is that correct?

Mr. TOMS. He was Mr. Nader's duly authorized representative at that point in time.

Senator HARTKE. Is he an engineer?

Mr. TOMS. He is not, to my knowledge. He did consult with and rely upon the advice given to him by engineers.

Senator HARTKE. All right.

Mr. TOMS. This is what we were led to believe.

Senator HARTKE. Did you follow the recommendations of Mr. Sellers just to appease Mr. Nader.

Mr. TOMS. No. We argued with him on a number of points. In the end, we were able to come to an agreement as to what the test program should be like.

Mr. BERNDT. Actually Mr. Sellers was very well advised of the opinion of our engineers. We understand that he had first-rate engineering advice and all of the test procedures that he suggested in his letter to us—it is in the appendix of the Corvair report—were thoroughly reviewed by our people. They concluded that it was indeed a very good recommendation.

Mr. CARTER. Mr. Chairman, if I may elaborate on that a little bit, we established the test procedures after detailed consideration of all material that was submitted by Mr. Nader's organization by working with our contractor, the University of Michigan in this area and our own in-house staff. It just so happens that most of the procedures that were recommended by Mr. Nader were agreed upon by the staff. The University of Michigan generally concurred.

Senator HARTKE. They had no rollovers, correct?

Mr. TOMS. Not on Corvairs.

Senator HARTKE. Did you check the procedures used for accuracy? They rolled over for GM and Ford, but when you tested them you couldn't roll them over?

Mr. BERNDT. We certainly did that, Mr. Chairman. We checked all of the GM films, the films that were brought to our attention by Mr. Nader, and the secret films that were furnished us by GM.

They were thoroughly analyzed over a period of several weeks with cameras that could stop the frame and permit us to analyze everything. We analyzed other films submitted to us, the Ford films which are detailed in the report that we issued last week. Then we conducted our own objective testing.

Senator HARTKE. Did you use an ordinary driver of average skill and just average proficiency?

Mr. TOMS. No, we used a robot or controller.

Senator HARTKE. A what?

Mr. TOMS. A robot.

Senator HARTKE. Driver?

Mr. TOMS. No. It's a machine. We used the machine because of the total inability to validate the variations from one driver or one input in one test to another.

This is the only device known to us that enables you actually and absolutely to reproduce inputs repeatedly on different vehicles under different test conditions.

Senator HARTKE. All right. Through this entire report, of which we have a copy here, there is a reference to a shortage of accident data.

Mr. TOMS. There is a shortage of accident data on Corvairs.

Senator HARTKE. Do you have a network capable of accommodating necessary accident data?

Mr. TOMS. We have been attempting to upgrade this capability for a number of years. As we mentioned in our last testimony, we are hard at work on an accident fatality file. Part of the problem, Mr. Chairman, is that these crashes have to be investigated in the local community by local police officers and then reported to State agencies and from State agencies reported to Federal or national agencies.

It's in this chain that the breakdown occurs.

Mr. SCHNEIDER. We are working to resolve that, if I might add, through our authority under the Highway Safety Act where we issue standards for the States to implement. We have had and are updating the records standard to improve the quality and the identity of the data that is generated as a result of whatever vehicle had accidents.

Senator HARTKE. You had three engineers who served on the review panel, is that correct? How were they selected?

Mr. TOMS. What we did was try to find people not working for General Motors. We tried to find people who had extensive and recognized experience in this field, and who in general among the professional engineering community were considered to be real authorities.

Senator HARTKE. Was Dr. Paul Wright one of them?

Mr. TOMS. Yes.

Senator HARTKE. Did he hold any other contracts with the Administration at the time he was evaluating the study of the Corvair?

Mr. TOMS. To my knowledge, no.

Mr. CARTER. Mr. Chairman, he may have had an accident investigation contract with us. If you look down the list there, we have three people. Since you mentioned Dr. Wright first, I might note that we felt it necessary to have a man with engineering depth, good technical depth plus practice experience in accident investigation.

It was our judgment that he was the best available man in this area. We listed Mr. Caldwell who, as you know, is an engineer and a racecar driver. He has built and driven many cars in many different types of environments.

In addition to that, we had Dr. Ressler from Cornell. He is an internationally recognized expert in this area and principally a theoretical type of man. It was our judgment we had excellent panel members and a good cross section for what we were looking for.

Senator HARTKE. Now, were independent observers permitted?

Mr. TOMS. No.

Senator HARTKE. Why not?

Mr. SCHNEIDER. It's been our policy on any investigation that the investigation is something that is totally within our prerogative and control and if you will, secret, until such time as that investigation is completed. Then everything becomes public.

We have set up a public file that totally discloses what was done during the course of the investigation. It's a longstanding practice. It's a longstanding practice of any agency, at least that I am aware of, that has investigatory authority.

Senator HARTKE. Are these included in your report, all the documents and films?

Mr. BERNDT. All of the films and all of the data——

Senator HARTKE. The studies?

Mr. BERNDT. All were made publicly available except certain information that is proprietary to the manufacturers.

Senator HARTKE. Except certain information which is proprietary?

Mr. BERNDT. That's right.

Senator HARTKE. Is that the usual governmental classification?

Mr. SCHNEIDER. No, sir.

Mr. BERNDT. We follow the Freedom of Information Act.

Mr. TOMS. There are data that we can request of the manufacturer, that they consider proprietary. If we were to release it to the public, they would not give it to us.

Senator HARTKE. Where General Motors employees or representatives present?

Mr. TOMS. No; they were not.

Senator HARTKE. I want you to list the proprietary material. Can you do that?

Mr. SCHNEIDER. Yes, sir.

(The following information was subsequently received for the record:)

The NHTSA has accepted as proprietary from General Motors an index of several thousand work orders, proving ground test reports, and films. From this index, NHTSA selected to review and analyze in depth some 162 proving ground tests and films. Sixty seven (67) of these test reports and films appear in the public files. Ninety five (95) have been accepted as proprietary. In addition to the foregoing, the NHTSA has accepted from GM as proprietary a Corvair litigation summary, and other test reports and analyses. Much of this latter material has been transmitted to us in bulk and has not been indexed. Finally, we have covering letters from GM requesting confidential status for all of the material mentioned above.

In addition to the foregoing, the NHTSA has accepted as proprietary from the Ford Motor Company some 59 similar tests, reports, films, and analyses.

The proprietary information detailed above has not been publicly indexed not placed in the public file, as is customary in all of our investigations. It is believed that any public disclosure other than that made above of a description of the designated documents would violate the integrity of our confidentiality agreement and investigative efforts.

Mr. BERNDT. I might say, sir, the information that is publicly available and the films and the tests and so on, I think, have accurately reflected the handling characteristics of the Corvair.

Now, for example, the two tests that were specifically called to our attention by Mr. Nader in September of 1970, were released by General Motors to the public.

Senator HARTKE. May we see those films?

Senator COOK. When can we see those films?

Mr. BERNDT. Anytime you like.

Senator HARTKE. Would you provide for the record a copy and the administration's analysis of General Motors Report No. PG 69 and PG 693?

Mr. BERNDT. Those are the two films we mentioned, and they are discussed in our report, sir.

The following information was subsequently received for the record:)

Attached is the NHTSA analyses of General Motors' reports PG15699 and PG17103.

The General Motors' films associated with these reports are available for showing at any time the Committee desires. The NHTSA has only one copy of these films and it is retained in our public file.

NHTSA ANALYSIS OF GENERAL MOTORS PROVING GROUND REPORTS, PG 15699 AND PG 17103

In Mr. Nader's letter of December 15, 1970, to Mr. Volpe (Appendix II), he cited two General Motors Proving Grounds reports—PG 15699 and PG 17103—which he asked the Department of Transportation to include in the investigation of the stability of the 1960–1963 Corvair. These two reports including the many

supporting charts, photographs, and movie film had been received from General Motors three months previously.

The General Motors tests, as explained in these reports, were conducted for the purpose of evaluating the roll stability characteristics of different suspension modifications on a 1962 and 1963 Covair.

Ten different sets of test conditions with various modifications were evaluated in PG 15699 and eight test conditions with various modifications in PG 17103.

To conduct the tests and protect the driver the windshield and rear glass were removed, a set of roll bars installed, rear seat removed, and the vehicle interior padded.

The vehicles were equipped with accelerometers and potentiometers to measure the accelerations and motions resulting from the tests. A camera was mounted on the vehicles to record suspension motions.

The vehicles were driven by a professional test driver at increasing speed increments using rapid steering, maximum throttle and torque inputs designed to test the various suspension modifications to the point of rollover or until it was difficult to produce a more violent maneuver.

The vehicle used in run number 120 of PG 17103 was a 1962 Corvair with 1963 production shock absorbers. It had been used for 64 runs in PG 15699 and PG 17103 and had been rolled over 10 times before run number 120. The tenth rollover (run number 117) was a severe one. The vehicle had a set of roll bars installed, the windshield and back glass had all been removed, the rear and front wheel openings were cut out, the rear seat removed and the body had been deformed in the previous tests. The center of gravity had been shifted upward and rearward as a result of these modifications to the vehicle. The conditions described above show that the vehicle was in a test development configuration that was not representative of a 1962 or 1963 production Corvair.

The hydraulic rebound limiting cutoff shock absorber used on run number 73 of PG 15699 was even longer than the 1963 production shock absorber. Also, run number 71 of PG 15699 which resulted in a rollover had exactly the same configuration as run number 73, except the rebound travel in run number 71 was limited by an additional one-half inch. There were many rollovers in PG 17103 in which rebound was restricted even more than in run number 73.

The configuration in PG 15699 that was similar to the RPO 696 package did not prevent a rollover. Also the rebound straps used in the RPO package did not restrict the rebound camber angle any further than the 1963 or 1964 production hydraulic rebound cutoff shock absorbers.

The rebound could not be restricted further than that of the 1963 production vehicles because there would not be sufficient wheelhouse clearance to remove the wheel and tire assembly.

The information contained in the PG reports and films do not represent conditions that would be experienced in the practical driving environment. The maneuvers that the test driver used were maximum throttle-extreme steering inputs designed to produce rollover. It was observed that many attempts involving extreme maneuvers designed to cause rollover were made by expert drivers before rollover actually occurred.

Frame-by-frame analysis of the films clearly established that wheel rim contact with the pavement is not the precipitating cause of Corvair rollover, but occurs in the course of rollover. Similarly, it has been established that while a moderate amount of positive camber and jacking at the rear wheels exists prior to rollover of the Corvair, tuckunder is not observed until the vehicle is well into a rollover mode. Tuckunder, therefore, is considered not to be a major contributor to Corvair rollovers.

In summary, because these development tests were so severe in nature and the vehicles used were in various states of modification these tests were not representative of the practical driving environment.

Senator HARTKE. On page 93 of the NHTSA Corvair report, comments by Mr. Smith, Fonda, and Surgee on the General Motors proving ground report do not provide valid data for determination that the handling and stability of the 1960–63 Corvair is unsafe. That is your judgment, too?

Mr. BERNDT. What page was that, sir?

Senator HARTKE. Pardon me?

Mr. BERNDT. What page of the report?

Senator HARTKE. Page 93.

STAFF. No. 7.

Mr. CARTER. Yes, Mr. Chairman; that is our position.

Mr. BERNDT. That's the report by those three engineers submitted to us by Mr. Nader as analyzed in our report.

Senator HARTKE. Has the National Highway Traffic Safety Administration banned sale to private citizens of the M–151 jeep used by the Armed Forces?

Mr. SCHNEIDER. No. We have not.

Mr. TOMS. It was our recommendation that the Defense Department not release these for sale to the consumer public.

Senator HARTKE. Why not?

Mr. TOMS. We felt the crash experience with that vehicle was such that it would not be in the public interest.

Senator HARTKE. Does it have the same axle as the Corvair?

Mr. TOMS. A swing axle.

Senator HARTKE. Is that why its sale generally is banned?

Mr. TOMS. I think it's the combination of the center of gravity, the general protection afforded in an open vehicle, and the nature of the vehicle's performance.

Senator HARTKE. Is the axle a factor?

Mr. TOMS. One of the factors.

But there are a lot of swing axle cars on the road, Mr. Chairman.

Senator HARTKE. Senator Cook?

Senator COOK. No questions.

Senator HARTKE. Thank you, Mr. Toms.

Mr. TOMS. One of the things you did not ask us——

Senator HARTKE. Go right ahead. We have a whole series of questions we have not asked, but we are going to submit those to you.

Mr. TOMS. We did want to comment on one thing. We are going to send a letter to each Corvair owner. The letter that the Government will send each Corvair owner will discuss the transition from 0.4 g. to 0.5 g., from understeer to oversteer, and will address about some of the special problems that one faces when driving that kind of a vehicle.

Senator HARTKE. Here is that question. We have other questions for you on the need for special maintenance, attention to tire pressure, the nature of understeer and oversteer.

Mr. TOMS. We just wanted to make sure it was on the record we are preparing this letter. We believe this will be a service to the American public.

Thank you, Mr. Chairman, and Senator Cook.

Senator HARTKE. Wait a minute. Is GM sending it out or are you?

Mr. TOMS. We are.

Senator HARTKE. Why not GM?

Mr. TOMS. We can't force them to do this. We think this ought to get there.

Senator HARTKE. Why can't you force them?

Mr. BERNDT. The law provides that the manufacturer must send out a letter if we find a defect, but not if we find there is no defect.

Mr. TOMS. There is a difference.

Senator HARTKE. What?

Mr. TOMS. We can only force them to send a letter to determine there is a defect.

Senator HARTKE. You haven't determined this to be a defect?

Mr. SCHNEIDER. That's correct.

Senator HARTKE. The panel's summary states the Corvair (I wasn't going to ask this, but you got me back into it) can change from oversteer to understeer in a short period of time, when the car is involved in a turning situation, under emergency situations. If the car does what is not anticipated by the driver, is that not a defect?

Mr. TOMS. It happens at lateral g's that are so high that the car is already close to being out of control and it's well beyond the point at which people normally drive their vehicle.

The panel and the professional engineers that investigated this matter felt this transition was so high in the g-scale that this factor together with the other characteristics of the car, including its controlability and crash avoidance maneuvers, were such that no defect was manifest.

Senator HARTKE. In other words, there is a difference between a defect and a situation close to a defect?

Mr. TOMS. There is a difference in the way cars handle. Cars can be designed, particularly sportier types of vehicles, so that the transition from understeer to oversteer is such that some people don't know how to drive them. But properly driven, these cars are probably more controlable or more maneuverable than pure understeer cars.

As a matter of fact, Mr. Chairman, we are moving——

Senator HARTKE. Have you asked General Motors to send out the letter?

Mr. SCHNEIDER. We think it's appropriate for us to send out the letter.

The answer to your question is no, sir. We have not asked General Motors. We think that in view of the unusual publicity associated with this case, the controversy of it over the years, that the Corvair owner has a right and a need to know what we have found. That is why we are sending the letter.

Mr. TOMS. We think the way——

Senator HARTKE. I would agree with that as a general concept, but we tried to make this the law, and we had resistance from every effort. I think that's a great idea. If you give me the language on it, I'll go ahead and write that law.

Senator COOK. You already have that authority. You are doing it, aren't you?

Mr. SCHNEIDER. Yes. We think we have the authority. No one has ever questioned it yet. We think we have the authority to send such a letter.

I might add, Mr. Chairman, I don't want to be misleading, we think this is highly unusual. We don't consider it as precedent-setting. I think we will look very hard at any other situations as to the possibility of sending such a letter in the future.

Senator HARTKE. Thank you, Mr. Toms.

Mr. Ralph Nader.

Mr. Nader, you may proceed.

STATEMENT OF RALPH NADER; ACCOMPANIED BY DR. CARL NASH; AND CLARENCE DITLOW, WASHINGTON, D.C.

Mr. NADER. Thank you, Mr. Chairman.

I would like to introduce on my left Mr. Clarence Ditlow, a lawyer, working in the area of auto safety. On my right Dr. Carl Nash, a physicist, working in the same area.

Mr. Chairman, members of the Senate Commerce Committee, thank you for the opportunity to express some comments on your oversight of the National Highway Traffic Safety Administration.

The only amendment to the National Traffic and Motor Vehicle Safety Act of 1966 said to be under consideration by this committee is renewal of the small volume manufacturer exemption authority of section 123. If any legislation is reported out of this committee this session, then it should be legislation which directly benefits the public rather than the motor vehicle manufacturers.

Such consumer legislation would include mandatory recall authority, extended warranty on equipment utilized to meet the Federal motor vehicle safety standards, and expanded public participation rights in Department of Transportation actions such as intervention rights in defect investigations, among others. The small volume manufacturer question should follow not lead these consumer protection amendments and it should not be an ever expanding loophole in an already swiss cheese style motor vehicle safety act.

Last week I sent to Mr. Douglas Toms, Administrator of the National Highway Traffic Safety Administration (NHTSA) a summary critique of the performance of the NHTSA under his sometime leadership. (A copy of this letter along with a letter of the same date to Secretary Volpe is submitted for the hearing record.) Almost all operations of this agency have been plagued by chronic under-achievement. Particularly noted were the nonsetting of standards for new and used vehicles, the lack of bold use of new technology, the poor enforcement of these standards, the almost total avoidance of issuing consumer information regulations, the practice of not staffing the higher eschelons of the NHTSA with permanent personnel, and the low priority given to defect investigations and the poor quality of those investigations which actually are taken seriously.

This latter criticism was brought well into focus with last week's release of the NHTSA findings on the early Corvair handling and stability. But before I discuss this case in detail I shall fill in some of the details of the NHTSA's other shortcomings.

DEFECT INVESTIGATIONS

Section 113 of the National Traffic and Motor Vehicle Safety Act of 1966 is a mandate to the National Highway Traffic Safety Administration to determine whether motor vehicles, items of motor vehicle equipment and tires contain safety related defects and to require the manufacturers to notify first purchasers and subsequent purchasers to whom a warranty has been extended of any safety defect. This provision has become a pool of quicksand into which controversial defects disappear, only to rise again when the heat of controversy has been removed by the cold sterility of a Government investigation.

This process was employed in an attempt to absolve the 1960–63 Corvair of its handling and stability faults. The lower control arm of 4 million 1965–69 Fords has been immersed in this icy bath for well over 2 years but it refuses to be sanitized. (Correspondence between the center for auto safety, Secretary Volpe, and Henry Ford II describing this defect is submitted for the hearing record.) Indeed, investigations which once took a matter of a few months now take a matter of years. (A June 28, 1972, letter from myself to Senator Magnuson describing the increasing delays is submitted for the hearing record.

All of these letters will be submitted with your permission, Mr. Chairman, for the hearing record. Some defects refused to be absolved by this process as did the engine mounts on 1965–69 Chevrolets which rose above two investigations to become the largest recall in the history of the National Traffic and Motor Vehicle Safety Act of 1966. (Samples of my correspondence with the NHTSA and the DOT describing the efforts to resolve this investigation are submitted for the hearing record.) The Rochester Quadrajet carburetor on 1965–66 General Motors vehicles has been submerged in the waters of an NHTSA investigation for a third time without finding a defect. (Again a copy of this letter to Mr. Toms urging expedited action on this matter is submitted for the record.)

Indeed, when the NHTSA cannot help but find a defect, the finding has all the bite of a toothless kitten. Owners of 1961–69 Corvairs with direct air heaters were initially notified of a lethal CO emitting defect in the engine/heater system which General Motors has silently known about for years, but General Motors callously disregarded the health and welfare of these owners by disclaiming design responsibility and refused to recall the vehicles. In other words, they sent a letter out under a demand by NHTSA to all these Corvair owners, 1961 to 1969, telling them the NHTSA thought there could be a carbon monoxide leakage in the passenger compartment but General Motors thought if they kept the engines in good shape there wouldn't be any problem. That, in effect, violated the effect of the letter.

Senator HARTKE. Wait a minute. Let's get the Corvair situation back in perspective. There are two situations here. One is the rollover situation which you are not dealing with?

Mr. NADER. I will in a moment.

Senator HARTKE. This is the heating defect?

Mr. NADER. That is right.

Senator HARTKE. At this moment there is no dispute for an existing defect; is that correct?

Mr. NADER. I think there is no dispute that carbon monoxide leaks into this compartment. The Government believes it is due to a defect in the heater/engine system. General Motors persists in saying it is when the car is not kept in tiptop condition.

That doesn't hold true for many other cars, but for the Corvair.

Senator HARTKE. Here you have an agency of the Government which has found a defect to exist and under the procedures to be followed, notified the manufacturer of the defect, General Motors. General Motors was then instructed to go ahead and notify the individuals under the law. They did do this but immediately took a waiver that they weren't really responsible and that they didn't agree.

Mr. NADER. That is right.

Senator HARTKE. They said the defect was not really as serious as was indicated by the administration?

Mr. NADER. In effect what they said was they repeated the Government's statement and then in the same letter told the owners it wasn't due to the car; it was due to lack of maintenance and if the owners wanted to bring it back they would have to pay for the changes at owner' expense rather than General Motors' expense.

Senator HARTKE. Then a second letter was ordered in which they were to omit that very provision excusing themselves, but they did not. Is that correct?

Mr. NADER. That is right. In full substance NHTSA ordered GM to send another letter without the disclaimer and once again GM put the disclaimer in the letter; again demonstrating its utter disregard for the law, the NHTSA, and the public.

I might say general counsel was embarrassed that they put this over on them in the first place and came out and recommended a second letter. But GM did virtually the same thing.

Senator HARTKE. Yes.

Mr. NADER. This particular defect I might add has nothing to do with the driver's skill. It is a deadly, ordorless, colorless, tasteless gas that affects rider behavior at lower levels and can be a serious health impairment at higher levels. It is considered, for example, at levels as low as 40 to 50 parts per million of carbon monoxide in the passenger department, inattention and nauseousness begins to set in.

There have been cases with 200 or more parts per million parts of carbon monoxide tested within the passenger compartment.

Furthermore, on November 4, 1970, a defect determination was made as to the three-piece Kelsey-Hayes wheel on 1961–65 Chevrolet trucks but the NHTSA has not even prevailed to the extent that a defect notification has been sent out. It is now bogged down in the courts.

This carbon monoxide situation, Mr. Chairman, highlights, I think, the attitude that prevails in the Highway Safety Bureau now that they have come out with this Corvair report we will discuss in a moment. According to CBS there is an interview a few days ago on the Covair report and the question was asked by the CBS reporter of Mr. Andrew Detrich, who is head of the Defects Investigation Office. The question was asked what would your words be to an owner of a 1961, 1962 or 1963 Corvair. Mr. Detrich answered "Drive it and enjoy it." He might have added and inhale the carbon monoxide as well.

That is the kind of irresponsibility that supposedly is coming from an engineer dealing with this case which is—has now become about as highly emotionalized and polarized for those who favor the Corvair as any issue can be. Those were his exact words. He was asked in front of millions of people by a CBS correspondent what would your advice be, what would your words be to an answer of a 1961, 1962, 1963 Corvair. And he said unqualifiedly, "Drive it and enjoy it."

I would like to turn to school bus safety for a moment.

While the number of children killed annually in school bus accidents is low, recent studies show that school bus injuries are increasing faster than the number of students transported. Injuries to the head, caused by impact with the upper portion of the seat back, constitute a very large percentage of school bus injuries.

There is absolutely no excuse for the continued absence of Federal regulations to protect school bus occupants. We would never package a commercial product the way we package our children, staring at an iron bar. Most of the serious injuries are easily preventable as demonstrated by a 1971 study by Siegel et al. which concluded:

> The absence of load-distributing, energy-absorbing seats, coupled with the absence of bus passenger restraint systems, has and will continue to be directly responsible for the majority of bus injuries and fatalities.

There is no excuse for the continued absence of Federal regulations to protect school bus occupants.

In the face of this clear need for school bus crash-worthiness standards NHTSA rulemaking has bogged down. What is worse, Mr. Toms (even after protest from the Center for Auto Safety) has allowed Mr. David Soule, NHTSA's pupil transportation specialist, to parade about the country denigrating vehicle standards for school buses and ingratiating himself with school bus body manufacturers and State administrators of pupil transportation by singing their tune at pupil transportation gatherings.

Standards for schoolbus operating systems, especially brakes, are in serious need of increased attention by the NHTSA. General Motors alone has conducted nine recalls of schoolbuses for chassis problems since March 1969. Six of these recalls have involved schoolbus brake failures, as Coleman McCarthy of the Washington Post has described so memorably, yet we continue to see little action from the NHTSA.

Senator HARTKE. I submitted a question on why there was just one person in the whole Administration which is assigned to schoolbus safety. That is the man, Mr. David Soule, to whom you referred.

Senator COOK. While you are at it, Mr. Chairman, I might add, Mr. Nader, you said in your opening statement the only amendment to the National Motor Traffic Safety Act said to be under consideration by this committee is renewal of the small volume exemption authority.

I have before me three bills that are under consideration by this committee right now. One of them being S. 2582 introduced by Mr. Nelson for himself and Mr. Proxmire to amend the National Traffic and Motor Vehicle Safety Act of 1966 to authorize safety design standards for schoolbuses to require certain safety standards be established for schoolbuses and to require the investigation of certain schoolbus accidents.

Another bill introduced by Mr. Moss, S. 3306, to amend the National Traffic Motor Safety Act of 1966 to require the establishment of standards related to rear-mounted lighting systems.

Another by Mr. Nelson and Mr. Mondale to amend the National Traffic and Motor Vehicle Safety Act of 1966 to provide for remedies of defects without charge and for other purposes.

Those bills are also before the committee at this time for consideration.

Senator HARTKE. Mr. Cook, let me tell you what the situation is. They are not before this hearing although they are before the committee. The reason they are not before this hearing is Senator Mansfield has issued an order there are not going to be hearings on any bills except those on the floor.

Senator COOK. They are the subject of the hearings that started last week because they were referred to by the chairman on the first day we started these hearings.

Senator HARTKE. That was last week.

Senator COOK. Well, let's not play with semantics. This is a full committee hearing. These bills are presently before us. If Mr. Nader is saying there is under consideration an amendment on the authority of section 123, then I can only say to the chairman that is not under consideration here either.

Senator HARTKE. Let me go ahead without arguing about that seriously. What Mr. Nader is talking about is that we should not put as the highest priority the question of the small manufacturer exemption.

Senator COOK. I don't disagree with Mr. Nader at all. I just want him to know the bills are presently being considered as a result of these hearings, and I am quite sure when we get through with this and back into committee we will take the position that hearings were held on these, as a result of the hearings that are held right now.

Mr. NADER. The distinction is as you both put it, the bills before the committee and the bills before today's hearing.

Senator COOK. We went into great length at the last hearings last week, as a matter of fact, with a distinguished Congressman from Montana relative to school buses and this is a continuation of those hearings.

Senator HARTKE. All right. Proceed.

Mr. NADER. I now turn to the Corvair stability issue. Before I go into it I might say first of all that there will be critiques that will be sent to the committee by vehicle handling specialists from around the country of the Department of Transportation's report and those will probably be forthcoming in a week or two. Second, the warning which Mr. Toms indicated he was going to send out to all the 1960–63 Corvair owners is in effect, I think, a reflection on the fact that they weren't as sure of what their report concluded as they might have thought. I believe Mr. Toms mentioned the phrase "some people don't know how to drive them." Now, this is the core of the controversy in the sense of how much should an average driver adjust to a vehicle's handling characteristics and how much should a vehicle adjust to a driver's handling characteristics.

Senator HARTKE. Is that not the core of the whole problem of highway safety? The question is not what you should do with a race car driver at Indianapolis Speedway, but how to contend with the fact that many people just do not have the capability, the proficiency, or the driving skills of a professional driver.

What we are trying to do is save people's lives after they are involved in the accident. That is the core of this problem.

Mr. NADER. The issue basically is how much burden should a car put on the driver, how much adjustment should a driver have to make to conform to the car? I don't think there is a single engineering dissent from the proposition that you should never design a car whose handling characteristics are significantly dependent on perfect front-rear tire pressure differentials because that in effect delegates the stability of the car to the local service station and to a hundred and one other variables such as whether they got the right tire pressure. General Motors from the first year of the Corvair has recognized that the tire differential pressures have got to be just so. If you are going to build a car, you engineer a level of stability into the car that isn't relying on the vagaries of tire pressure differentials between front and

rear to the extent that the Corvair is, as acknowledged in the owner's manual sent out to owners of Corvairs by General Motors in the early 1960's.

Senator COOK. Mr. Nader, may I ask if it would be possible for the committee to have Mr. Sellers here in the near future relative to the discussion that we have just had with Mr. Toms?

Mr. NADER. I think that would be an excellent idea.

Senator COOK. I would like that very much because I think in all fairness to you, he might be able to give a better evaluation of these tests, having been in some degree consulted by the Department, and we could get a better overview of exactly the degree of acceptability than we could from only an analysis of the report itself.

Mr. NADER. Fine. I am sure he would be pleased to do so.

Senator COOK. Good.

Mr. NADER. On April 24, 1969, I wrote to Mr. Lowell K. Bridwell, Administrator of the Federal Highway Administration, citing the responsibility of the National Highway Safety Bureau to achieve the recall of the Corvair, a defective vehicle which the manufacturer refuses to recognize as such. Shortly afterward, on June 4, 1969, Dr. William Haddon, Jr., then head of the NHSB, recommended to Mr. Bridwell that the Bureau take the following action. I want to quote this briefly to indicate the route taken by the present Administration.

> I would very much like to get to the bottom of this issue. In doing so, I believe it is absolutely essential that the evaluation and sorting out of the issues be done by a group as scientifically and professionally impeccable as possible and not by any group or agency which has already been criticized from any direction on the issue. I, therefore, recommend that we take this to the National Academy of Engineering (coequal to the National Academy of Sciences) and request them, whatever fiscal support they require, and within our limited resources to appoint a blue ribbon ad hoc group which would undertake to answer just as thoroughly and as objectively as possible the questions which have been raised with respect to the early Corvairs.

This plan for action was stillborn. It was partially resurrected in bastardized form more than 3 years later with the appointment by the NHTSA of three engineers with no vehicle handling experience, to review the now existing materials, primarily those provided by General Motors. We have asked, by the way, a specialist in this area whether any of these three gentlemen were known in the automotive vehicle handling area, and they said no.

The charge to this panel of three engineers was the following:

> To arrive at joint panel findings, conclusions and recommendations about past and future NHTSA programs for evaluation of the 1960–1963 Corvair handling and stability.

Point one, they went way beyond this charge which they are not authorized to do. Point two, the word "joint" is prejudicial to their task because they should have been encouraged to dissent if indeed they did dissent, rather than watering everything down to the lowest common denominator.

In the meantime, early in 1971, an investigation was finally initiated by the Office of Defects Investigation to determine whether the handling and stability of these Corvairs was defective under the definition of the National Traffic and Motor Vehicle Safety Act of 1966.

The NHTSA's investigation, carried out with their usual ineptitude, appeared to be moving toward a conclusion of no defect without the

NHTSA's even having done any testing of actual Corvairs. That's an indication of their earlier attitude. I therefore again wrote to Secretary Volpe on February 23, 1971, stating:

> Of necessity, the issue of instability is one that must be answered by something other than a rationale which relies on the staged experimental tests by the party charged with manufacturing the defect.

[That referred to GM.]

With completely uncharacteristic dispatch, the NHTSA let a contract, without even going through the usual bidding process, to Texas Transportation Institute (TTI) to carry out the testing of the Corvair and other contemporary automobiles. Because of the careless speed with which these tests were undertaken, inadequate preparations were made to check the validity of the testing procedure, or the adequacy of the choice of tested vehicles to resolve the Corvair handling and stability question decisively.

One example in all the manufacturers' tests of tires, they use regular drivers, test drivers. No drivers were used in this 1963 Corvair test. As far as I know, there has never been a robot or automatic pilot killed in a Corvair test.

Although the tests were nominally carried out by TTI, the Highway Safety Research Institute (HSRI) of Ann Arbor, Mich., supplied the driving simulators and demonstrated their use to TTI personnel. Further, because TTI had had no previous experience with vehicle dynamics testing, Messrs. Mervyn Lilley and Svein Larsen of the NHTSA, gentlemen of no particular reputation in the field of vehicle dynamics, designed and supervised the tests.

That the tests were highly suspect was made blatantly obvious by the fact that in none of the TTI tests reported on did the Corvair turn over. When the NHTSA was asked why did you pick a 1963 Corvair, why not 1960, 1961, 1962 as well; the answer was that's all they could get. That's all they could find. It was apparently purchased by a lady in Detroit who said her Corvair was unsafe and she wanted to get rid of it. We suggested she send it to the Highway Safety Bureau.

Senator Cook. Mr. Toms testified it was on the recommendation of your Mr. Sellers they used the 1963.

Mr. Nader. No; it was not. The comment by Mr. Sellers was the following: A woman from Detroit told us she didn't like her Corvair because it was hazardous. She asked what could we do with it other than turn it into a compressed footstool. The answer was send it to the Highway Safety Bureau. That's what he was referring to. They presumed they could use all the Corvairs that were given to them, particularly free.

The Corvair had repeatedly turned over for GM engineers in a number of tests reported in their proving ground reports. The Corvair had turned over three times for Ford engineers, according to Mr. Harley Copp, during their early comparative testing of the Falcon and Corvair in the latter half of 1959. The Corvair had turned over for HSRI consistently in 47-mile-per-hour "J" turns, using the same driving simulator provided to TTI for its tests.

I might say sometimes a Ford comment might be considered as self-serving. In this case, I would like to say every evidence is it is just the opposite. Mr. Copp has jeopardized his career for speaking

out. The Falcon is out of business, the Corvair is out of business, and it is hardly something that is going to resound to the company's benefit.

Senator HARTKE. Mr. Copp is here today, and we will have his testimony today.

Mr. NADER. I might say this represents the first time any engineer for an auto company has gone to a congressional committee and spoken his professional conscience. I consider it an historic mark on that ground alone, since this country depends so heavily on engineering.

In fact, the Corvair has turned over for virtually every investigator who has explored the handling and stability characteristics of the automobile, and for a good many private citizens who have not. The fact that TTI could not induce a rollover of the Corvair when "the sequence of inputs was that which HSRI concluded was most apt to place a vehicle in a rollover mode," and "by varying the magnitude and timing of inputs described above, an effort was made to induce rollover in each vehicle tested," makes the entire TTI exercise a farce.

The engineering critiques which will be forthcoming on this point, I am sure will have a comment on that particular facet of it.

At the point where TTI and the NHTSA found that they could not induce the Corvair to roll over in this sequence of programed tests, they should have halted the tests and reviewed the following:

1. The preparation of the vehicle. Was it in a condition which was equivalent to that of vehicles typically in the hands of consumers? Did the fact that the vehicle was fully loaded make the Corvair more stable than it would have been lightly loaded? Since tire technology has advanced considerably since 1959, and since tires must now meet Government standards, were the modern tires used in the tests genuinely representative of tires used on the original Corvairs? For example, most Corvairs were driven on 1960, 1961, 1962, 1963, 1964 tires. They were not driven on 1972 tires. These were tires in virtually brand new shape.

2. The vehicle model and body style. Was the 1963 Corvair four-door sedan of the type used in the TTI tests representative of all types of 1960–63 Corvairs of all body styles, coupe, convertible, station wagon, and bus wagon? Why didn't the NHTSA test the 1960, 1961 or 1962 Corvairs—all of which rolled over in GM or Ford proving ground tests recently made public?

These testing ground tests didn't show a rollover because they were tested in 1963. It might have placed a greater burden on the Government if they had to show that 1961 or 1962 didn't roll over when Ford showed these cars did roll over.

3. The testing procedures. Were the testing procedures carried out correctly, and was the drastic brake maneuver actually "most apt to place a vehicle in a rollover mode?"—using an automatic test pilot, not drivers.

As if this were not enough, the NHTSA and TTI compounded their folly by looking primarily for the vehicle to roll over and ignoring the other major design hazard of the Corvair, its unstable reaction to a quick transient input followed by the normal response of a typical driver which exacerbates the instability of the original stimulus. A Corvair goes from understeer to oversteer in a rather rapid fashion. The sluggish steering of those Corvairs compared to, say, a VW's quicker steering can make a driver—not one of the better drivers on

the road—so handle it as to go out of control. It is probable that such circumstances, even in the absence of rollover, are responsible for a significant number of Corvair single vehicle crashes, if not for the majority of them. The fact that the TTI tests were carried out in driving simulators rather than by drivers, makes it incumbent on the NHTSA to show that the programing of the simulators actually duplicated the normal reactions of typical American drivers in emergency conditions.

The NHTSA has added insult to incompetence in their handling of the rest of the investigation. Without apporaching Dr. B. J. Campbell of the Highway Safety Research Center in Chapel Hill, N.C., to obtain his latest accident data which is highly damning of the early Corvair and Volkswagen, the NHTSA report discounts his earlier findings as being offset by contrary findings of Cornell Aeronautical Laboratories in a more limited study.

Concerning film presented to this committee by the Ford Motor Co. after one of their leading engineers spoke up, the NHTSA said, "It is concluded that the film and Mr. Copps' [sic] analysis is [sic] not a valid evaluation of the handling characteristics of a 1960 Corvair." He will be able to answer that, I am sure.

Worst of all was the choice of a panel of engineers, at least two of whom have a conflict of allegiances, to add an air of legitimacy to the NHTSA's whitewash. To the slight credit of these engineers, they were not completely taken in by the NHTSA. Although they exceeded their charge in doing so, they recommended that owners of early Corvairs be advised about the vehicles' unusual handling characteristics, and cautioned about the need for extraordinary maintenance and attention to tire pressures.

One of the engineers, by the way, has had a career in auto racing. If there is anything prejudicial against the critique of the Corvair it is auto racing service. The other individual had a contract with the Government. If they wanted to find someone completely arm's length, they would hardly find someone who goes out and investigates crashes in terms of drivers and other inputs under a Department of Transportation contract.

Further questions are raised by this investigation. Since the VW and the Renault were found to be worse than the Corvair, will there be a further investigation into the handling and stability of these vehicles, or into the VW Microbus and the Subaru 360? And if these vehicles were found to be defective, how would the NHTSA justify ignoring the Corvair?

The entire Corvair investigation has been carried out in a political spirit as though the prmary reason for the investigaton was to rebut my declarations. The NHTSA seems to have lost sight of the original purpose of this investigation: The protection of a major segment of the public who are in daily jeopardy while using these vehicles. Most of the early Corvairs are now driven by the very young or the poor. My letters to the Secretary of Transportation and to the head of the NHTSA have been attempts to prod the agency into resolution of this tragic episode.

Consider the following: Mr. Carl Thelin, a former GM engineer who was part of the testing team on the Corvair for that company, has previously documented testing which was done at the GM proving grounds in which it was found that the handling of the Corvair was

seriously deficient when compared with other contemporary automobiles, and with GM's own standards. Given the lurid intrigue and deception surrounding the Corvair litigation on the part of General Motors that has so tainted the judicial process—as shown in many documents and testimony—it is shocking to witness the groveling, minion-like kneebends of Mr. Toms and his agency abiding by GM instead of serving the innocent victims of this automobile.

It is useful to ask what would the NHTSA have had logically to do if it had found the Corvair to be unacceptably hazardous: 1. It would have had to demand that GM recall these early Corvairs, which it has no authority to do under the existing law. It can recommend it, but it can't require it. 2. It would have had to seriously consider doing the same for similarly culpable VW's and Renaults.

Senator HARTKE. We passed that in the Senate.

Mr. NADER. They took it out—so you have to consider it again. I understand the administration is not going to favor a recall. That would have involved international repercussions. 3. It would have exposed GM to legitimate litigation by legitimate plaintiffs, instead of shielding it from such litigation as they have done; and 4. It would have alienated Ed Cole, father of the Corvair and president of GM, who has been dangling interest in the air bag in front of Mr. Toms in return for repeated concessions on other matters. Note that Mr. Cole has been keeping his options open; that he has not committed GM to the air bag on a given date, but simply tantalizes Mr. Toms who has little beyond the air bag proposal to show for his 2 years at the helm of the NHTSA as absentee administrator. He is putting all his marbles on the air bag.

The Corvair is nowhere as important in his judgment. Indeed the statement was made in his report that the Corvair is being phased out by attrition and hence does not get the significance it demands. It is important to note how the higher priority of the air bag by Mr. Toms has driven him in his concessionary relationship with GM.

I might say this is such a hot issue as far as Mr. Cole is concerned that when Mr. Copp made the commentary on the Corvair, vis a vis the Falcon—according to Thomas Whiteside who concluded an investigation on this issue in a book that he has released—Mr. Ford in effect called up Mr. Roche of General Motors and apologized. Apologized because one of his engineers had had the effrontery to state he thought the Falcon was safer than the Corvair. That's a reflection of how people realize the sensitivity of this matter to General Motors.

Given these consequences, it is not surprising that the NHTSA took the cowardly way out and chose the Corvair over its casualties. It would be important to request that the NHTSA provide for the public record all test data, test procedures, parties who had any relation to the foregoing in an employee, consultant, observing, and reviewing capacity; and a list of all contacts—in person, by letter, and by telephone—between GM personnel or their representatives and agents. Notice there are letters included in this report but no communications dealing with General Motors or other parties.

I might add, Mr. Chairman, that GM has conceded by practical policy in numerous sizable settlements, a number of them over $100,000, with plaintiffs on rollover and casualty cases. It is doubtful they would have settled if they felt they could sustain their burden after

the release of these proving-ground documents of GM showing these rollovers which was about 2 years ago.

The fact General Motors offered optional equipment in the form of suspension limiting devices, front antiroll bars, and improved shock absorbers for their 1962 and 1963 models, that the suspension was extensively modified in the 1964 models to eliminate the worst of its deficiencies, and that the 1965 Corvairs were redesigned with a dual link suspension system, is testimony to the defects in the original equipment 1960–63 Corvairs. For all of these subsequent engineering improvements were known to GM engineers in the 1950's.

It was not like discovering new things. They knew about it in the 1950's. After their experience with the early Corvairs, they put them on their later Corvairs.

The NHTSA has previously found a defect, admitted by GM, in the heating systems of the 1961–69 Corvair—a defect which causes drivers and passengers to be drugged into inattention and an inability to react quickly in an emergency. This is the carbon monoxide and other combustion gases leaking into the passenger compartment. GM is requiring owners to pay for repairs of this defect, however.

GM secretly settled, about 8 years ago, for $125,000 one such case, described in sworn testimony before your committee by the victim's lawyer, on condition that there be no disclosure of the settlement and its cause, and that all documents and evidence be turned over to GM for disposal by the defendant corporation.

Senator HARTKE. We heard that in hearings, and it has been printed in the official records.

Mr. NADER. Exactly.

In summary, despite authenticated GM proving-ground test documents from 1962 showing spectacularly consistent Corvair instability and rollovers by company test drivers on flat pavement under the kinds of conditions that can be expected to occur on roads and highways; despite the testimony of former GM engineers who were involved in the testing program confirming the unique hazards; despite the recent disclosures by a former GM lawyer that the chief counsel for GM in the Corvair litigation thought back in 1964 that the Corvair should be recalled; despite unrebutted Ford tests of the 1960 Corvair confirming instability; despite statistical data from actual auto crashes showing exceptionally poor Corvair single accident crash records in comparison with other models—despite such overwhelming evidence from these and other sources, the NHTSA, through biased testing procedures and model selection, pronounces that the Corvair is not any more unstable than comparable year models of VW's and Renaults. Since these models are also well known, during those years, to be similarly unstable, due to similar suspension design, the NHTSA is saying with this comparison that since arsenic is no more hazardous than cyanide, that the Corvair is innocent by association.

The Corvair rolled over for GM, the Corvair rolled over for Ford, the Corvair has been rolling over on roads throughout the country, but the Corvair just couldn't roll over for the Government because the Government rolled over for it and GM.

The NHTSA holds the ultimate responsibility for the reasonable determination of this case. In this task, they have failed, not simply because they did not find a defect in the Corvair's stability and han-

dling, but because the quality of work, sufficiency of evidence, and even the basic premises of the investigation have all been faulty.

I present this sordid history to you during these oversight hearings as perhaps the best example of the failure of the NHTSA to fulfill its mission in improving traffic safety on the American roads. Again, as in my letter to Senator Magnuson last week, I ask that the Committee on Commerce of the U.S. Senate fully investigate this matter, in order that we may never see again this shoddy level of performance in our public servants in the NHTSA.

Thank you.

I would also suggest the committee review the letter of warning which the Department of Transportation intends to send out to these early Corvair owners in order to determine that the letter is understandable and reflective of the concern that so many in the handling field have held for the Corvair's instability.

I would also like to ask permission for more materials to be submitted for the hearing record, if you please, and for you to request of Mr. Toms' agency more detailed provisions of the early proving ground reports submitted by General Motors.

Senator HARTKE. That last request is already submitted to the Administrator and certainly the record will be kept open for you to hear these others.

The hour is late and I thank you, Mr. Nader. I want to ask you just one question: Will the Corvair situation ever be settled?

Mr. NADER. The Corvair situation will be settled when the Corvairs go off the highway by just wear and tear, as they are every day. I don't think the Government report is the last round in this controversy. I think there will be additional critiques of this report, and additional investigation of this report.

But the report now has a significance far beyond the number of Corvairs on the highway today. It's significance is that it is going to jeopardize the Government's auto safety program because all the forces against auto safety will now say, "Look, see what the Government came out and said about the Corvair. What else is the Government going to do in this area that might have the same pendency?"

Secondly, it illustrates the difficulty in a regulatory agency of coming up against the kind of corporate power and the kinds of consequences of a decision in the public interests. This is one reason why I think the Government has got to have the kind of testing facilities and the kind of personnel who have absolutely no interest in going to work for the industry after they put in their 3 or 5 or 7 years in Government.

The Food and Drug Administration has been torn again and again because of the movement of their personnel into the pharmaceutical industry, for instance, and the same will hold true here in the auto companies. Mr. Detrick, for example, I understand is an engineer. What happens when he wants to quit working for the Government? Where is he going to work? He's going to work for the auto industry. It puts him under a conflict of allegiance that is unfair to the public. We have got to have people who have absolutely no interest in going to work for the auto industry conducting a test with such perturbing consequences to General Motors.

Senator HARTKE. Mr. Nader, thank you again for very helpful testimony and the help you have been to the committee over the years. Much education still must be completed. I hope there will be a time when hearings will not be in the spirit of antagonism, and the automobile industry would understand that we are trying to stop the tragedy and the tribulation that comes from 150 people being killed every day as a result of automobile accidents.

We began at 50,000 highway deaths per year, now there are 57,000. I grant you that the tragedy of the highway death no longer evokes much emotion except to those who are personally affected. Highway accidents are looked upon as nothing more than another raindrop in a great big shower. Some place we must make a definitive effort to change that situation.

Thank you.

Mr. NADER. Mr. Chairman, those words were obviously very well put. There are more people killed in this country on the highways in 1 year than the number of U.S. soldiers killed in Vietnam since the war started over there.

I think that the attention given to the auto safety issue in 1966, 1967, 1968 was far greater than the attention given now.

Now I do want to emphasize the importance of these letters which detail all of the other program failures that we think are of priority significance by the National Highway Traffic Safety Administration. This testimony has been heavily on the Corvair because that is the immediate and timely focus for it. But these letters that we are submitting are the product of many hundreds of hours work by Dr. Nash and Mr. Ditlow, who have been regularly overseeing this agency. They focus on a serious deficiency both in terms of personnel policy, in terms of research, in terms of standards that have not been put out which we commend to your attention.

(The information referred to follows:)

JULY 17, 1972.

HON. JOHN VOLPE,
Secretary of Transportation,
Washington, D.C.

DEAR MR. SECRETARY: The Chevrolet Division of General Motors Corporation is again engaged in an illegal conspiracy with its franchised dealers to circumvent the requirements of the National Traffic and Motor Vehicle Safety Act of 1966. A large number of 1972 Chevrolet Vega automobiles were produced without correct gross vehicle weight ratings (GVWR) on their certification labels. This is a violation of SS 108 and 114 of the Act and of 49 C.F.R. 567.4. Additionally it appears to be a safety defect and a violation of the motor vehicle safety standards under S. 113 of the Act. The legally mandated method of correcting such a violation is to notify owners by certified mail, and dealers by either certified mail or other more expeditious means. Copies of all communications of any type to dealers or owners (including oral communications) must be sent to your department. General Motors officials, with at least the implied approval of Mr. Edward Cole, President of GM, have chosen to wage a secret campaign to change the certification labelling on these vehicles, and thus to avoid notice by either the general public or the Department of Transportation.

The importance of the gross vehicle weight ratings was made clear by General Motors itself in the Kelsey-Hayes wheel case. This case, which is currently in the federal courts, involves 1960–65 ¾ ton Chevrolet and GMC trucks with 15 x 5.5 inch three piece wheels manufactured by the Kelsey-Hayes corporation to GM's specifications. These wheels have been found to be defective by the National Highway Traffic Safety Administration (NHTSA) because of the tendency of the wheels to split open allowing a sudden and complete loss of air. General Motors contended, on the other hand:

"* * * we have proven that this wheel has adequate design. In other words, it is designed to accompany a reasonable overload of 15% * * *."

They further added:

"* * * a brief period of excess loading can cause a crack to occur in a wheel. Thereafter such a crack may develop to the point of wheel failure with further use of the truck even under proper load."

Thus, it appears to be the policy of General Motors to design very close to the GVWR, making knowledge of the correct GVWR crucial to the safe operation of a GM vehicle. The recently announced recall of the Chevrolet Vega for defects in its rear axles tends to support this supposition. Thus, the NHTSA should conduct an extensive investigation into the question of whether overloading of the Chevrolet Vega, resulting from a GM created owner's ignorance of the correct GVWR, may have led to damage which will show up in a catastrophic failure at some time in the future.

There is also a larger issue raised by this case. That is the issue of corporate lawlessness. General Motors has repeatedly illustrated that it considers itself the judge of when it is necessary to comply with the law, and when its own procedures will be used. Their lawlessness is not even limited to the United States. Although GM may have complied minimally with the requirements of defect notification in the U.S. in the recent Chevrolet engine mount recall, we recently learned that in Canada, they did not comply with the similar Canadian statutory requirements. Rather, GM sent defect notifications by first class mail to owners of the defective vehicles.

To bring GM back within the law and to protect the public on the highways, it is essential that you investigate the extent of this violation. General Motors must be fined for its recidivist practices to the full extent of the law, $1,000 per vehicle found not in compliance, up to the maximum allowed under the law, $400,000.

On a more general plane, I would like to request that you consider initiating a thorough and up-to-date review of the NHTSA. With the coming oversight hearing by the Senate Commerce Committee, such a review would be entirely timely. Should such an effort be undertaken, we would be pleased to have your staff call upon us for information and recommendations.

On a number of occasions we have spoken with Mr. Toms about serious delays, shortcomings, gaps and attitudes which have made the NHTSA inadequate to its mission. With his customary amiability, Mr. Toms has recognized most of these problems, promised much, but has performed little by way of improvements or needed changes. This could be in part due to his absenteeism from his office on domestic and foreign trips and his extraordinary delegation of running the NHTSA to his deputy, Dr. Charles Hartman. I am enclosing a copy of a letter I have prepared for Mr. Toms concerning his performance as head of the NHTSA.

Symptomatically, he has permitted the air bag to be held in hostage by the auto companies, particularly General Motors. Virtually everything else in the auto safety area is given a low priority or abandoned because of the former. The auto executives, particularly Mr. Edward Cole of General Motors, have learned that by tantalizing Mr. Toms and keeping open the possibility of their cooperation with him, yet without having to publicly declare their acceptance of the air bag for a certain model year, they will receive little pressure in the numerous other important safety areas and investigations. There is little question that what personal relationships and assurances that Mr. Toms has privately developed with auto executives revolve around this basically constricting theory of priorities.

Almost six years have passed since the federal government launched its auto safety program. In one significant area after another initial slow motion efforts have declined toward utter immobility. This is particularly tragic since so much could have been done given the lead time years since September 1966, to move safety engineering and other motorist protection practices very significantly forward. There has also been abundant experience showing weakness and deficiencies in the original legislation, yet the department has taken little leadership in recommending strengthening amendments of the law to basically sympathetic committees of the Congress.

Please give these matters your personal energetic and motivational attention. For much progress can be achieved through additional leadership which you can provide.

Sincerely yours,

RALPH NADER.

JULY 17, 1972.

Mr. DOUGLAS TOMS,
Administrator, National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C.

DEAR MR. TOMS: Throughout the course of our involvement in the field of motor vehicle safety over the past several years, we have been in general agreement on many areas of traffic safety in need both of improvement and increased involvement by the federal government. Despite frequent reminders to you and the National Highway Traffic Safety Administration (NHTSA) concerning specific areas of improvement in resource allocation and regulation, the performance of your agency has consistently belied your promised leadership.

1. In numerous discussions, we have agreed on the need for application of advanced technology to the solution of the motor vehicle safety problems which are intractable under the limited current vision of the NHTSA. The only significant exception to the cosmetic approach to traffic safety in the NHTSA has been its support for passive occupant restraint systems. Rule making such as the current occupant protection rule, presented boldly in 1970, has been the victim of inadequately disclosed research and technical support which made it a ready target for the industry's biased engineering attacks. Your agency has been forced into ill-defended retreats on several occasions, postponing the effective date a full two years, weakening the injury criteria, and making optional the rollover test for vehicles which meet the roof intrusion standard number 215. The final act of irresponsibility on the part of the NHTSA is its refusal to wage an aggressive campaign for the sanctioning and funding of massive testing of air bags by the federal government. This crucial task is being left mostly to chance, such as fleet test acceptance by sympathetic companies, and the dubious social conscience of the auto industry.

2. It has been six months since I requested that the NHTSA initiate action with an advance notice of proposed rule making on automatic collision avoidance systems. Although you assured me on January 11, 1972, that you would expedite this simple action, we still wait for issuance. The purpose of the advanced notice is not to commit the agency to a particular concept of the standard, nor even to commit the agency to promulgation of a role. Rather, it is an exploratory step, designed to bring together the diffuse knowledge of the state of the art and to stimulate further investigation, innovation, and development. It further prods the auto manufacturers to give serious thought to practical problems of incorporation of these systems into their future designs, and into computation of lead time requirements. The longer the initiation of this potentially revolutionary standard is delayed, the longer the public will be denied its protection.

3. Other areas of rule making which have been given only lip service in the agency are simple auto design for pedestrian protection (including simple and solvable problems such as protection of hands from closing doors), handling standards, impaired driver-vehicle interaction standards, and standards which will ease the disadvantage of small cars in small-large car crashes. Even the more mundane standards which could have been promulgated or significantly improved years ago are only now receiving minimal attention. For the most part, the public will wait to the last half of the decade for most of them to take effect. The most egregious example was brought forcefully to light by Consumers Union in their recently published tests of child seating systems which met the NHTSA's standard 213. While this standard deserves a priority at least as great as that of standard 208, occupant crash protection, your agency has been far more concerned with the protection of the industry producing child seats. A similarly lax attitude has pervaded the Office of Operating Systems in their issuance of standards on tires and brakes for vehicles other than passenger cars, vision standards, motorcycle standards, crashworthiness standards, and lighting standards consistent with the speed capabilities of modern vehicles.

4. Your continued inaction on the questions of the 1,000 pound exemption from the motor vehicle safety standards, and the exemption of multipurpose passenger vehicles and light trucks from many of the important passenger car standards is equally inexcusable. You have given me assurances on several occasions of your concern for these exemptions but typically have not translated your concern into action. Whatever dubious basis were offered for these exemptions in the early days of the traffic safety law, they should not have been allowed to remain in effect simply from the force of continued lethargy.

5. Consumer information, touted by you as a better alternative to S976, the damageability bill, has remained without significant improvement since you

took office. If your support of consumer information was more than a self serving statement, it would have been accompanied by new and more useful information than is now required. Tire quality grading standards, another aspect of consumer information, have also been given low priority, despite the explicit statutory deadline of September 9, 1968, for issuance. These standards have still not been issued and there is no indication when they are likely to be issued.

6. Standards for vehicles in use are in an even sorrier state. Nearly five years after the deadline set by the Congress in the National Traffic and Motor Vehicle Safety Act of 1966, the NHTSA finally issued a program plan for standards for vehicles in use which must be the feeblest document to emanate from the NHTSA during your tenure. It essentially limits itself to recommending vehicle inspection of only brakes, steering, suspension, and tires. Abandoned are more general inspections which might detect degradation of safety equipment required when a vehicle is new, and degradation of crashworthiness due to corrosion, fatigue, and wear. Also discarded are standards for durability of new vehicles and for minimum freedom from maintenance of safety systems similar to those required by the Environmental Protection Agency for emission controls.

7. Action on vehicle standards for school buses has been minimal. While children continue to be impaled on "cookie cutter" sheet metal edges in school bus crashes, rule making has bogged down in occupant restraints; seat anchorages and floor strength, and vehicle operating systems, including brakes, fuel systems, and exhaust systems. Mr. Toms, your lethargy on these standards has forced Congress to take bills which would require the NHTSA to take action.

8. Causal compliance testing of vehicles and tires has consistently shown a failure rate of around 7%. Yet this rate is not reflected in either the requirements for notifications of owners of non-complying vehicles, nor in the assignment of penalties for non-compliance. Your agency has continued to operate its compliance testing on a piecemeal basis rather than taking a systematic approach to vehicle testing. This practice is not only inefficient, it does not give a picture of the overall hazards of vehicles. Since your agency is committed to a systems approach to motor vehicle standards, why hasn't it taken a similar approach to standards enforcement? The Office of Operating Systems has also mostly ignored the problems faced by the Office of Standards Enforcement in testing for compliance with ill-defined standards.

9. Numerous vacancies in the NHTSA staff can only have contributed to delays in the NHTSA's programs. According to NHTSA testimony before the Senate Commerce Committee on June 13, 1972, the total number of current vacancies was 125. Although the White House imposed ceiling is a causative factor, the vacancies include such key positions as the Director of the Research Institute which should have been filled in any event. Other key positions such as the Associate Administrator for Motor Vehicle Programs have been filled by acting personnel. The excessive use of acting personnel extends to the lower levels of the NHTSA into such positions as the director of the Office of Defects Investigation. This discounting of NHTSA staff is a significant factor in alleged morale problems at the NHTSA.

10. NHTSA investigations into motor vehicle safety defects have slowed to a snail's pace during your administration. The average pendancy for sets of 50 investigations into defects has soared from a low of 2.7 months under the previous Administrator to a high of 10.3 months under your aegis. The increasing delays could be attributed to your low priority for defect programs.

Indeed, defect determinations have become hot potatoes—to be made only after considering how the motor vehicle manufacturers will react. On March 31, 1972, you told me that you had approved the decision on the Corvair handling and stability investigation and that it would be released in a few weeks when higher levels in the Department had approved it. Yet in a hearing before the Senate Commerce Committee on June 13, 1972, you stated that you were waiting on a report from a panel of professional engineers before making the decision. Did this investigation regress during the interval between March and June? And there are persistent rumors that the decision on the Ford lower control arm investigation will not be announced until after the November elections.

Further appraisals of your dormant administration are needed and will be conducted. This is not to deny your consistent amiability, fulsome assurances of both pending improvements, and greater presence on the job in Washington. It is only to fully discount such amiability of purpose and assurances of action to be completed. Without doubt, you have had about the most liberal depreciation schedule for smooth talk in the annals of bureaucratic Washington.

Sincerely,

RALPH NADER.

CENTER FOR AUTO SAFETY,
Washington, D.C., July 10, 1972.

Mr. HENRY FORD, II,
Chairman of the Board,
Ford Motor Company, Dearborn, Mich.

DEAR MR. FORD: Catastrophic failures of lower control arms on 1965–1969 full sized Ford Motor Company products continue unabated. It is incredulous that Ford, in the face of continued arm failures—eleven (11) more of which are reported in this letter—persists in its self serving declaration that the arms are safe. We appeal to you personally to act now to prevent additional human and economic losses from Ford lower control arm failures.

A reliable source has informed us that your company has spent literally hundreds of thousands of dollars to cover up this problem. Specifically, we understand that Ford has at least 4 or 5 persons working full time on customer complaints regarding this defect and has produced an elaborate propaganda barrage, complete with color movies, to attempt to convince the National Highway Traffic Safety Administration (NHTSA) that no serious defect exists. As you doubtless know, several independent testing organizations have conducted analyses of the lower control arm to determine the primary factors contributing to sudden, hazardous arm failure. All have concluded that there is an inherent defect. In a tacit admission of the defect—and proof that Ford has already produced a fix—the company has retracted from its dealers' stock all the original design control arms, substituting in their place a thicker part. Ironically, this has hindered further testing shince laboratories wishing to test unused thinner arms have been forced to obtain them directly from Detroit, a dubious policy at best.

Regardless of cause, regardless of Ford's hollow assertions that no defect exists, lower control arms on these Ford products continue to fail with astonishing frequency. There is absolutely no evidence that the Ford vehicles are driven any differently than other cars on the road which are not experiencing such control arm failures. In fact the overwhelming majority (over 80%) of cases brought to the attention of the Center for Auto Safety are failures, at low speed on smooth, straight roads and do *not* involve impact or driver abuse. In our opinion this constitutes a serious safety defect.

We request that you initiate a complete recall of these cars immediately for the purpose of replacing at no expense to the owner both front lower control arms on all affected vehicles. This request is based on the extensive history of lower control arm failure (with another chapter added by the reports enclosed) plus other factors discussed herein.

Enclosed are copies of thirteen (13) letters describing possible lower control arm failures not previously reported to the NHTSA by the Center for Auto Safety, plus follow-up data on five (5) failures previously reported to the NHTSA. These letters report sixteen (16) cases of failure of this crucial suspension component on 1965–69 full sized Ford products. These thirteen new letters are in addition to the eighty-nine (89) letters previously brought to the attention of the NHTSA in twelve (12) letters since October 25, 1970.

The Center for Auto Safety believes that consumers who have experienced the hazards concomitant with product defects have valuable insights on both the experience itself and the response from the manufacturer, for instance, James Stickley, a Ford customer since 1934, was "driving the kids to school" when he experienced a lower control arm failure. As he points out in his letter, "If I had been on the expressway, there could have been a terrible accident."

Carl Robison, in Indiana, expressed similar sentiments: "Can you imagine what would have happen (sic) to me and my son had it broken while driving on the Interstate. . . . How safe are you when the wheel just folds under on a car that is just two years old."

Von Waters, an owner in Georgia, described a harrowing failure at 60 mph fortunately with "no traffic in either direction;" he aserted that the car had not been abused in any way.

An attorney in New Jersey, Seymour Casper, learned that his lower control arm failure was not just a random occurrence when a neighbor informed him of the article "Twenty Auto Defects That Could Kill You," (Motor Trend, June 1972). Mr. Casper said ". . . that my car which is regularly serviced by Manhattan Ford is maintained by me in the best operating condition possible."

The Auto Safety Research Center in Columbus, Ohio was contacted by a Mr. Fred Jenkins concerning lower control arm failure.

The parts of this failed arm were examined by Materials Joining Consultants of Columbus, Ohio, which found:

"The fracture appears to be a fatigue type fracture which propagated slowly over a period of several years. Such fractures begin with some critical event which may actually be as basic as a design error or as innocent as a "bad" heat of steel or a stamping mishap. These errors then produce a crack or notch which acts as a stress riser causing a fatigue type of fracture which results in short life of the part. In the case being considered it is evident that the critical event was a matter over which the owner or operator would not have control."

Dr. Harry Watson, of Aberdeen, Washington, wrote of a left lower control arm failure on February 19, 1972. He said:

"We were assured by our dealer that this was a rare occurrence and that we need have no fear of a similar recurrence, however, on June 12, 1972 the same thing happened to the right lower control arm. . . . I consider this a very serious defect as if either of these fractures had occurred on a freeway at a speed of 70 miles per hour I am sure that only tragedy would have resulted. I also feel that it would be very difficult for anyone to trace down the cause of the accident following the damage that would have been done to the car and to the driver and occupants at freeway speeds."

Joseph Weber, an articulate consumer from Florida, wrote:

". . . I must admit that when I now drive my Ford I not only lack confidence in its reliability, but I fear for my safety and also for others who might lose their lives in an accident that could have been merely written off as 'loss of driver control.'" In response to a typical Ford Customer Service Division reply letter (which usually contradicts the customer's description of his experience in an attempt to choke off all complaint) Mr. Weber wrote "I believe that you have missed the whole point of my correspondence with the Ford Motor Company. I had never requested any reimbursement of expenses associated with the failure of the lower control arm of my 1969 Galaxie XL, as you state in your letter. The sole purpose of my correspondence was to inform the Ford Motor Company of my sad experience with their product and also to afford them an opportunity to show at least enough concern to ask me for the failed control arm for engineering analysis (which I specifically offered)."

John Cornpropst, an Ohio owner, wrote: "To the best of my knowledge there is nothing that I have done to cause the A-Frame to break, nor was there anything that I could have done to prevent such an occurrence. Had the A-Frame broken 10 minutes later on the Shoreway, I would have been involved in a very serious accident. . . . I am surprised that the Ford Motor Company has not recalled and replaced all such parts."

Ford's stubborn, self serving refusal to acknowledge a defect, and to recall and fix all vehicles equipped with this inadequate control arm is even more outrageous in light of the company's pronouncements surrounding its two most recent recalls. When consumer pressure (elicited by the press and public interest groups' actions) forced Ford to announce a second recall of some 400,000 defective 1972 Torinos and Montegos for a rear axle/bearing defect, the company suddenly expressed concern for customers' safety. Ford's news release said "The second [recall] . . . is to remove any question about the durability and performance of our 1972 Torinos and Montegos and Ford's willingness and ability to stand behind its products." In fact, Ford wrote the Center for Auto Safety in response to our letter requesting this second recall; the letter read in part: "We want to assure you that we share your concern for vehicle safety and for the confidence owners place in our products. I believe that the company's recent announcement . . . points up this concern. We hope you agree." If Ford does indeed share our concern it can give us evidence by recalling all Ford products equipped with the defective control arm.

A more recent recall involved 4 million 1970 and '71 Ford products for replacement of defective plastic locking grommets in the seat belt system. One Ford employee was reported to have said: "You know we have not overlooked too many things when we get down to grommets." We then wonder how Ford manages to overlook a part as large as a lower control arm. Perhaps this apparent oversight is due to the difference in cost between the grommets and the lower control arms.

No one aware of the seriousness of the lower control arm defect could possibly be convinced of "Ford's willingness and ability to stand behind its products." Further, the Center for Auto Safety is *not* assured that Ford shares our "concern for vehicle safety." Quite the contrary, it is abundantly clear from the enclosed letters, and nearly 100 letters regarding lower control arm failure previously sent by the Center to the NHTSA, that your company has contempt for motor vehicle safety when its pocketbook is threatened and no great concern for the

confidence owners place in its products.[1] Indeed Ford's response to owner criticism is to tell the consumer he is wrong and to attempt to persuade the consumer that his hair-raising experience has no safety defect implications. A more effective means of undermining owner confidence could not be conceived.

The nature of the lower control arm failures may be such as to preclude concerted consumer outrage, since reported failures have generally occurred at low speeds. This raises the question of how many lower control arm failures are unreported because they occurred at higher speeds and caused serious crashes—the arms now buried, like the crash victims, in auto graveyards. To date, the Center has been informed of lower control arm failures allegedly associated with six (6) deaths and twenty-nine (29) injuries. A tabulation of these instances and copies of the applicable correspondence are also enclosed. This should impress upon Ford Motor Company the necessity of recalling these cars immediately, before further irreversible tragedy results.

This senseless suffering need never have occurred. If Ford had listened to some of its own design engineers the defective design of the lower control arm could have been avoided. The Center for Auto Safety has been in separate contact with two former employees of the Ford Motor Company who worked on the design of the arm in question. These persons, who asked that identity be withheld, essentially verified each other's facts. They said that the design initially proposed for the 1965 front suspension specified metal of .156 inches thickness. Subsequently, however, Ford's chief engineers decided to narrow the thickness of the control arm at the mounting point of the lower ball joint (a main steering and suspension component) from the proposed .156 inches to the final .125 inches. This compromise in material strength was a cost benefit decision, sacrificing safety for presumed dollar profit. According to our sources, strong objections to this decision were voiced in 1962 and 1963 including notice to you personally that the arm was unsafe.

Apparently it is more than a mere coincidence that virtually every lower control arm case involves catastrophic failure at the mounting point of the lower ball joint.

We therefore repeat our longstanding request that you commence a recall campaign immediately. Until then your public pronouncements of concern for motorists' safety and of willingness and ability to stand behind your products remain totally—and tragically—vacuous.

Sincerely,

LOWELL DODGE,
Director.
BERNARD P. O'MEARA,
Staff member.

CENTER FOR AUTO SAFETY,
Washington, D.C., January 19, 1972.

Mr. JOHN A. VOLPE,
Secretary of Transportation, Department of Transportation, Washington, D.C.

DEAR SECRETARY VOLPE: On August 19, 1970, the Department of Transportation and the Ford Motor Company announced a recall of some 85,000 police vehicles made by Ford because of-the tendency for the lower control arms to fail under "severe impact loading." However, some 4 million non-police, full-sized Fords, Mercurys' Thunderbirds, and Continentals, with the same control arm, were not recalled at the same time. The reason given for excluding these vehicles from the recall campaign was that non-police vehicles are subjected to less severe usage than the Ford products used for police service.

One year later, your Department announced that it planned to conduct tests to determine whether to issue a notification of defect for the non-police vehicles with the same control arm. However, the testing specifications are such that only impact failure would be apparent. Evidently the National Highway Traffic Safety Administration has accepted Ford's assertion that lower control arms fail as a result of severe impact, despite the fact that the Center for Auto Safety has sent to NHTSA some 54 consumer letters reporting lower control arms fail-

[1] Ford's efforts to circumvent discovery in lower control arm litigation allegedly are blatantly fraudulent. One attorney wrote the Center: "At any rate I have found it impossible up to date to get Ford Motor Company to produce this [the lower control arm] defect report relating to the lower control arms and the police car. This came to a climax in Detroit last week when in pursuant to an Order directing Ford to produce the defect report the Ford attorney attempted to offer some documents other than those commanded by the Court Order."

ures on non-police vehicles manufactured by Ford, on which only three involved reported impact.

Your Department has recently received a report of metallurgical analyses of lower control arms performed for the Insurance Institute for Highway Safety by Value Engineering Laboratoy. This study provides new evidence that the arms are inherently defective and concludes "the cause of failure of these arms which failed in catastrophic manner can be attributed primarily to corrosion fatigue". Therefore, it is likely that the incidence of lower control arm failure will increase with vehicle age because of the relatively slow action of corrosion fatigue. Also, it is probable that failures will be more common following the winter and in "sections of the country where ice and snow are prevalent during winter months", according to the IIHS study. It should be obvious that a high percentage of the failures which are allegedly caused by impact could have been cases of corrosion fatigue exacerbated by impact with a curb or pothole; whereas, it is unlikely that a crack initiated by impact would later result in non-impact failure.

Included in the eight previous letters sent to the NHTSA by the Center for Auto Safety, transmitting reported instances of arm failure, are several cases of severe injury resulting from non-impact control arm failures. Enclosed with this letter is the driver's description of a crash which reportedly resulted when the left lower control arm failed (non-impact failure) on Mr. Raymond H. Danon's 1969 Ford Galaxie, fortunately at low speed.

It is time that the NHTSA reject Ford's specious assertions that the lower control arm failures are caused only by abnormally high impact loadings. It should also be apparent that testing being performed for the NHTSA will not detect the most crucial cause of failure—corrosion fatigue.

We urge that the inadequate testing contract be suspended and that the Department act immediately on the findings of the study commissioned by the Insurance Institute for Highway Safety. It is crucial that the safety agency make an early determination of whether a defect exists, and, if so, to issue a notification of defect and recommend that Ford conduct a recall campaign. Such action is necessary in order to prevent failures which may otherwise result from the corrosive effects of the salts used on the roads this winter. The defective lower control arms are a threat to the lives of the drivers and passengers of the more than 4 million full-sized Ford products in which they are installed, plus the occupants of other cars which might be involved in the resultant collisions.

NHTSA Administrator Douglas Toms wrote in his 28 September 1970 letter to Ralph Nader (in response to Nader's 21 September 1970 letter to you) : "We will always stand ready to consider new and relevant evidence [on lower control arms on Ford products] and to take whatever subsequent action is called for to protect the motoring public."

New evidence has now been mounted and subsequent protective action must be taken. We believe that your response to this letter should be in the form of a defect notification rather than the typical "thank-you-for-your-input" letter.

Sincerely,

BERNARD P. O'MEARA,
Staff member.

JUNE 30, 1972.

MR. DOUGLAS TOMS,
Administrator, National Highway Traffic Safety Administrator,
Department of Transportation, Washington, D.C.

DEAR MR. TOMS: I enclose for your review a letter that I received from Mr. Ralph Nader regarding performance of the National Highway Traffic Safety Administration with respect to defect investigations and recalls. The allegations made in this letter have caused me considerable concern and raise serious questions about the ability of NHTSA to carry out the mandate of Section 113 of the National Traffic and Motor Vehicle Safety Act of 1966.

In view of the fact that the Senate Commerce Committee will be conducting oversight hearings on July 19, I request that you analyze Mr. Nader's contentions and recommendations and submit to the Committee a preliminary outline of your comments. Also, be prepared to respond to questions regarding the letter at the July 19 hearings.

I am looking forward to your comments.

Sincerely yours,

WARREN G. MAGNUSON, *Chairman.*

Enclosure.

JUNE 28, 1972.

Senator WARREN MAGNUSON,
Old Senate Office Building,
Washington, D.C.

DEAR SENATOR MAGNUSON: In enacting the National Traffic and Motor Vehicle Safety Act of 1966, Congress provided in § 113 for federal investigations to determine the existence of safety related defects in motor vehicles and items of motor vehicle equipment and to require the manufacturers to notify the owners in a clear and expeditious manner of such defects so that the defects can be remedied. This Congressional purpose is not being carried out.

The National Highway Traffic Safety Administration (NHTSA) which is responsible for administering the Act, has an Office of Defects Investigation (ODI) to conduct defect investigations and monitor defect recall campaigns. The first 19 months of defect investigations (October 27, 1967 through May 1969) resulted in the completion of 121 investigations with an average pendency of 3.1 months. The second 19 months of defect investigations (April 1969 through December 1970) resulted in the completion of only 102 investigations with an almost doubled average pendency of 5.5 months. The last year of defect investigations (January 1971 through December 1971) resulted in the completion of only 59 investigations with an average pendency of 9.3 months.

The delays in defect investigations are increasing. The latest available pending defect investigation list (May 31, 1972) contains one investigation initiated in 1968, 7 initiated in 1969 and 11 initiated in 1970. Even if all these investigations were completed as of today, the average pendency would be an incredible 28 months. At this investigatory rate, the potential defects may well eliminate many of these motor vehicles from the road before the ODI completes its investigations thereon.

Examining defect investigations in sequential groups of 50 confirms the increasing delays in the conduction of defect investigations. The first 50 investigations (IRs 1–50 initiated between October 27, 1967 and September 6, 1968) took an average of only 2.7 months to complete. The second group of 50 investigations (IRs 51–100 initiated between September 6, 1968 and March 13, 1969) have averaged 5.4 months in duration.[1] The third group of investigations (IRs 101–150 initiated between March 13, 1969 and October 3, 1969) have averaged 5.7 months. The fourth group of investigations (IRs 151–200 initiated between October 3, 1969 and February 1, 1970) have averaged 8.4 months in length. The fifth group (IRs 201–250 initiated between February 1, 1970 and October 1, 1970) have averaged 10.3 months. The sixth and most recent group of investigations (IRs 251–300 initiated between October 1, 1970 and May 15, 1971) have averaged 9.0 months. The average pendency in these later groups will continue to rise and many investigations are still pending therein.

The NHTSA proudly points to the recent announcement of the record recall of 6.8 million Chevrolets for engine mount defects as a mark of excellence for effectiveness in conducting defect investigations. Indeed, the engine mount defect could be considered the classic example of the NHTSA's ineffectiveness in the face of the multibillion dollar corporation protecting its pocketbook.

The NHTSA initiated its Chevrolet engine mount defect investigation on October 20, 1969. On December 12, 1969, the NHTSA assigned this investigation an inactive status after General Motors revealed only 14 complaints of engine mount failure causing jammed accelerators on 1968 Chevrolets. The NHTSA apparently did not have the staff to pierce GM's veiled reply to find out how many complaints there were on other model year vehicles and on jammed accelerators where the owners did not realize broken engine mounts caused the jamming or how many replacement mounts GM had made or sold. Nor did the NHTSA apparently have the funds to conduct its own consumer surveys or testing of Chevrolets with failed engine mounts.

The Chevrolet engine mount investigation continued in a moribund state until September 1, 1971, when I, by a lengthy letter to Administrator Toms of the NHTSA, urged an accelerated investigation. Coverage of this letter and an October 1971 NHTSA "Consumer Protection Bulletin" resulted in the receipt of hundreds of consumer complaints by both myself and the NHTSA. But not until

---

[1] The average pendency for investigations in this and subsequent groups of 50 will continue to rise since these groups contain pending investigations. As the later groups contain more pending investigations than the earlier groups, the average pendency for investigations can be expected to show a greater increase in these later groups. Exhibit A provides a breakdown of pending investigations for each group of 50 investigations.

December 4, 1972, over two years after the NHTSA initially began its investigation, did GM agree that Chevrolet engine mounts were indeed defective. During these two years, thousands of Chevrolet engine mounts failed, hundreds of accidents occurred and at least 6 deaths allegedly resulted. Many of these occurrences could have been prevented if the NHTSA had acted quickly and effectively when first aware of the Chevrolet engnie mount problem.

But despite the announcement of the recall on December 4, 1971, the Chevrolet engine mount case presents almost as serious a safety problem as when first discovered. Almost 7 months after the recall announcement, only 1.4 million Chevrolets have had the "bailing wire" restraints installed; leaving 5.4 million Chevrolets on the road with defective engine mounts. At the present rate of repair, the recall campaign will not be "completed" until well into 1973. The NHTSA has been unable or unwilling to expedite this recall.

Nor is the Chevrolet engine mount recall an isolated example. The 1972 Ford Torino-Mercury Marquis axle and 1972 Chevrolet Vega carburetor recall campaigns announced several months ago have scarcely begun. Indeed, the "completed" recall campaigns usually average less than 70% completion. Every accident statistic that results from a known defect that goes uncorrected despite a recall campaign is not only senseless, it is inexcusable.

In order to determine the reasons for the increasing length of defect investigations and the relative ineffectiveness of recall campaigns, I respectfully request that you ask the General Accounting Office to investigate the current capacity of the NHTSA to conduct defect investigations and the adequacy of the NHTSA procedures to monitor and expedite recall campaigns. This request is particularly pertinent at this time since the Senate Commerce Committee is conducting NHTSA oversight hearing during the last two weeks of July. A GAO investigation would be most helpful in determining whether remedial legislation is necessary in the area of defect investigations and recall campaigns.

Thank you for your consideration and anticipated reply.

Sincerely,

RALPH NADER.

Enclosure.

EXHIBIT A

Group and investigation	Date initiated [1]	Current pendency (months)
IR's 51–100: 98	Mar. 13, 1969	39
IR's 100–150:		
128	Aug. 1, 1969	35
150	Oct. 1, 1969	33
IR's 151–200:		
161	Nov. 1, 1969	32
169	Dec. 1, 1969	31
190	Jan. 1, 1970	30
IR's 201–250:		
209	Feb. 1, 1970	29
212	Apr. 21, 1970	26
228	June 1, 1970	25
233	July 1, 1970	24
248	Oct. 1, 1970	21
249	do	21
IR's 251–300:		
252	Nov. 1, 1970	20
258	Nov. 15, 1970	19
264	Dec. 1, 1970	19
266	Jan. 1, 1970	18
276	Mar. 1, 1970	16
278	do	16
279	do	16
282	Apr. 1, 1970	15
283	do	15
287	Apr. 20, 1970	14
289	May 1, 1970	14
296	May 15, 1970	13
297	do	13

[1] Due to the restrictive information policies of the NHTSA on pending investigations, the date initiated is estimated from completed investigations begin at approximately the same time as the investigations listed. Hence there may be an error of no more than a few days for some of the initiation dates.

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., July 17, 1972.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Commerce,
U.S. Senate,
Washington, D.C.

DEAR MR. CHAIRMAN: Thank you for your letter of June 30 enclosing a letter from Mr. Ralph Nader in which he complains of the Office of Defects Investigation (ODI), National Highway Traffic Safety Administration (NHTSA) performance with respect to defect investigations and recalls. I have carefully analyzed Mr. Nader's letter and submit the following comments in response to his allegations.

I note that Mr. Nader contends essentially in the overall content of his letter that the NHTSA efforts in the field of safety defect investigations have degraded rather than improved since their inception. This view I must vigorously reject, since, sharing the same concern which is expressed by both Mr. Nader and yourself on the issues, my Administration has consistently sought and has achieved significant improvements in the form and direction of our effort. Further, I feel that an analysis of the background of the ODI and our current approach to investigations into possible safety related defects under the National Traffic and Motor Vehicle Safety Act of 1966 will support my position.

I would note, also, generally in connection with such an analysis which follows herein that in point of time many of the views set forth result from the perspective of experience gained over the entire history of our operations to date and were not necessarily apparent during the period in which the events or situations referred to were occurring. However, it is now my earnest conviction that a realistic, perceptive, indepth awareness does exist with regard to the needs of both the Government and the public and that the following will illustrate the reasons for my optimism.

Initiation of the NHTSA effort into investigation of motor vehicle safety defects within the meaning of the Act of 1966 began October 27, 1967, with creation of the Defects Division, Office of Compliance (now the Office of Standards Enforcement), Motor Vehicle Programs (MVP), with a professional staff of three persons. At inception, the Defects Division provided a capability limited by certain inherent weaknesses:

(1) The relatively unknown quality and quantity of the safety defect problem;

(2) The learning curve involved in developing viable operational procedures;

(3) The comparative inexperience of both inhouse and contractor engaged personnel in conducting safety defect investigations, particularly in the areas of mechanical and material testing;

(4) The absence of historical comparison data for input received;

(5) The lack of precedence on legal issues involved; and

(6) The overall difficulty of conducting indepth investigations due to the foregoing handicap factors.

During what, for the purposes of this review, will be termed an interim period between October 1967 and the end of 1970, substantial progress was made in overcoming to a degree the above problems. A clear understanding certainly developed concerning the nature of motor vehicle safety defects; both inhouse and contractor personnel experience had been gained in defect investigations; appreciable historical comparison data had been collected for use in connection with new input; legal issues were largely clarified and the ability to conduct indepth investigations greatly improved. The latter ability resulted not only from the improvements cited but also from a gradual increase in the professional staff of the Defects Division which as of December 1970, consisted of 13 engineers and technicians.

Nevertheless weaknesses persisted both in the areas showing improvement and elsewhere. In addition, the escalation of official and public concern over safety defects during the October 1967—December 1970 interim period had reached serious proportions. Therefore, in keeping with its responsibilities, the NHTSA undertook a hard-look review and analysis of Defects Investigations with the intent of improving its operations and upgrading its importance.

As a result, on July 1, 1971, the Defects Division was removed from the Office of Standards Enforcement and raised to the status of a separate office, the

Office of Defects Investigation, which was assigned primary responsibility for investigation of safety related defects in motor vehicles. The professional staff was increased to 24 and administrative as well as operational refinements were made during the latter part of 1971 and early 1972. In addition, key personnel changes occurred during this period. A new Acting Director was appointed as was a new Chief, Investigations Division. Both had prior and extensive background experience compatible with their respective areas of responsibility.

I believe that the overall changes effected since July 1, 1971, were important ones as they relate to the future efficiency and success of our defects investigation effect. Let me cite, for example, some new programs which we anticipate will (1) lead to an increased input and an earlier awareness of possible safety defect problems, and (2) significantly reduce the time lapse between the initiation of an investigation and its completion.

PARTS RETURN PROGRAM

The NHTSA has established an ongoing parts return involving some 300 indepedent automotive repair shops. Distributed geographically throughout the United States, the participating shops are contributing failed parts removed from vehicles and equipment which may represent a safety defect problem. Received first by the contractor for study and analysis, significant input is then referred to MVP for appropriate action.

AUTOMOBILE CLUBS

In June 1972, contracts were entered into with the Automobile Clubs of Missouri and Southern California. The contractual services provided the NHTSA include:

1. Ability to rapidly identify and contact owners of a particular make, model, model year combination within a 30 mile radius of the clubs' facilities.
2. Inspection and analysis of vehicle problems in a well equipped shop suitable for such activity by a qualified technical staff.
3. On a request basis, survey make, model, model year combinations for specific safety problems under investigation as possible safety defects using the computerized membership file for access to vehicle owners.
4. Furnish monthly reports of vehicle malfunctions contributory to accidents as investigated and identified by the Insurance Accident Investigation Group of the clubs and supplemented with real time spot reports of significant developments within the one month period.
5. Furnish monthly summary of data gathered from the vehicle diagnostic center to supplement with real time spot reports of significant developments within the one month period. On a request basis, search the computer data file for information relating to investigations in progress.

OWNER INTERVIEW PROGRAM

Three contracts have been let with firms possessing a capability to interview motor vehicle owners throughout the United States from whom NHTSA has received safety related complaints. These contracts enable the NHTSA upon request to have owner statements obtained, photographs taken of failed components or possible defect areas and, if indicated, the failed component secured for analysis or evidentiary purposes.

The parts return program and the automobile club contracts provide us with input in significant areas which were previously not available and the owner interview program will be of major assistance through performing field work of a type which is generally a time consuming endeavor involving inhouse personnel who will now be able to devote the time saved to matters more compatible with their expertise.

Turning to the substance of Mr. Nader's letter, I note that in paragraphs two through four, he cites figures tending to relate the pendency time of ongoing in-

vestigation as the basic criteria for assessing our performance. I must take exception to this concept. In the first place, the evaluation of the performance of the ODI based upon the period of time encompassed by an investigation appears unwarranted. Performance should be measured by results and the salutary influence of the ODI on the industry. The upswing in recall campaigns, 87 percent of which are voluntary (50 percent of the number of vehicles) indicates there is a very real recognition of the existence of ODI. Recognition by the press in recent months of the increased recall activitiy of the industry confirms this conclusion. It is believed that this leverage is far more important than statistics on the time consumed in a particular investigation. In any event, there are other time considerations. Our investigative activity, for example, frequently requires lengthy periods of laboratory testing the results of which, in turn, indicate the need for additional similar effort if we are to gather the factual and evidentiary data needed to successfully confront the manufacturer.

"Exhibit A" attached to Mr. Nader's letter was examined and I am enclosing a corrected pendency list based upon current data in our records. Please note that investigation 190, shown on this list, relates to a travel trailer survey and that it initially had a total of 20 subsections, nine of which have been closed as a result of recalls issued by seven manufacturers involving replacement of understrength components on 4,188 vehicles. Note also that cases 128, 161, 169, 278 and 228 will receive impetus toward conclusion through our owner interview program previously described.

The NHTSA, as described previously herein, has taken other steps which should assist substantially in reducing the pendency length for investigations.

The NHTSA did initiate an investigation into the alleged failure of Chevrolet engine mounts on October 20, 1969. However, the investigative findings and input from consumers and other sources during the period between October 20 and December 12, 1969, did not reveal that a significant widespread problem was involved and on December 12, 1969, the investigation was placed on an inactive status.

Additional input received in August 1970, from Mr. W. J. Ward prompted us to again open an investigation on the Chevrolet engine mounts. As a result of this inquiry, on December 4, 1971, General Motors Corporation notified the NHTSA of intent to recall certain model year Chevrolets for the installation of an engine mount restraint cable to prevent the development of a secondary problem should an engine mount separate. As you know, the recall and installation of the restraints, at no cost to the vehicle owner, is a voluntary act on the part of this manufacturer.

A total of 6,606,695 vehicles are involved in this campaign. Chevrolet is manufacturing parts in seven plants on a seven day workweek including holidays. 3,095,000 parts had been shipped to dealers through June 26, 1972. Mailing letters to vehicle owners was started February 21, 1971. 1,587,106 (23.7 percent) have been corrected in four months at a rate of about 20,000 a day.

The first quarterly reports on results of the 1972 Ford Torino-Mercury Montego axle recall campaign and the 1972 Chevrolet Vega carburetor recall campaign have not been received due to the relatively recent initiation of these efforts by the manufacturers. Accordingly, precise figures are not available on progress made to date.

The foregoing represents an outline of my thoughts and the NHTSA's position on the allegations raised by Mr. Nader which caused you considerable concern. As always, I welcome the opportunity to respond to questions relating to the conduct of this Administration.

Sincerely,

CHARLES H. HARTMAN,
Acting Administrator.
DOUGLAS W. TOMS,
For Administrator.

Enclosures.

EXHIBIT A

Group and investigation	Date initiated	Current pendancy (months)
IR's 51–100: 98	Mar. 13, 1969	11 (opened Mar. 18, 1969, closed Sept. 27, 1969, reopened July 8, 1971.)
IR's 101–105:		
128	July 25, 1969	35.
150	Oct. 6, 1969	32.
IR's 151–200:	Opened Oct. 30, 1969, closed Nov. 17, 1960, reopened Aug. 31, 1971.	9.
190[1]	Jan. 1, 1970	28.
IR's 201–250:		
209	Mar. 11, 1970	27.
212	Police vehicles opened Mar. 20, 1970, police vehicles closed Sept. 16, 1970.	19 (reopened Nov. 1, 1970).
228[2]	May 14 1970	24.
233	July 1, 1970	Closed June 30, 1971.
248	Aug. 24, 1970	21.
249[3]	Oct. 1, 1970	Closed Dec. 10, 1971.
IR's 251–300:		
252	Oct. 13, 1971	19.
258	Nov. 15, 1970 (Chevrolet)	Closed Dec. 4, 1971.
264	Dec. 1, 1970	18.
266	Dec. 10, 1970	18.
276	Feb. 18, 1971	16.
278	Feb. 23, 1971	16.
279	Mar. 2, 1971	16.
282	Mar. 22, 1971	16.
283[2]	Mar. 24, 1971	16.
287	Apr. 5, 1971	15.
289	Apr. 12, 1971	15.
296[2]	Apr. 30, 1971	14.
297	do	14.

[1] Involves several subsections on manufacturers of travel trailers whom we are investigating for possible wheel, axle, and suspension components overload.
[2] Cases in process of closing.
[3] Listed current audit investigation.

OCTOBER 12, 1971.

Mr. DOUGLAS TOMS,
Director, National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C.

DEAR MR. TOMS: My letter to you dated September 1, 1971, urged an accelerated investigation into the defective engine mounts in over 5 million 1966–1969 Chevrolets. My letter stated:

"A broken motor mount is a serious safety defect; it should not be treated lightly by your office. When the mount breaks, it allows the engine to lift and jam the accelerator in the fully open position. In many cases, the difficulty in controlling the resulting runaway car is compounded by the loss of power assistance to the brakes as the vacuum line is simultaneously detached. If the frightened driver tries to stop by turning off the ignition, his power steering is lost and the steering wheel may lock.

Chevrolet, in a tacit admission of the weakness of the original design, has redesigned the replacement mounts which it supplies to its dealers. We have further learned that Chevrolet is no longer denying warranty claims on damaged motor mounts regardless of vehicle mileage and that they are now automatically referring resultant damage claims to their insurance company, Royal Globe, in the form of an 1141 claim. Under these circumstances, the gross delays and limited scope of your investigation is a deceptive practice which misleads consumers."

The Chevrolet engine mount has a safety defect inherent in its design. The fact that the metal-plastic bond in the motor mount may be subject to deterioration in exposure to heat and petroleum products is not the chief issue in this case. It is rather the lack of a metal interlock to prevent complete failure of the mount, when the metal-plastic bond separates, which is the defect. The fact that this defect imposes fearful dangers to occupants is testified to in the many letters received by the NHTSA, Bob Irvin of the Detroit News since his first motor mount story two weeks ago (see the October 11, 1971 Detroit News) and myself. In further support of this finding I am enclosing twenty more letters from consumers which describe the results of engine mount failure.

In the last two weeks you have made several statements to the press [1] which indicate that you plan to issue a so-called consumer warning bulletin on the Chevrolet engine mount case in the near future. You have not been quoted as commenting on your legal responsibilities to demand a safety defect notification campaign by GM. There are increasing indications that the NHTSA is leaning toward the consumer bulletin as a substitute for defect notification orders or as an inordinate delaying tactic. Such bulletins reach very few people. They mostly appear, if at all, as squibs in newspapers. No agency effort is made to prepare television film or radio voice clips. Public Service ads are not solicited. Without promotion and distinctness of language scant news attention naturally is given to your toned-down, low key bulletins.

But much more important is that such a move at best is a tiny fraction as effective as a defect notification order. Whether as substitute or delay, the consumer bulletin for vehicle defects is an administrative repudiation of the pertinent notification provision in 1966 Safety Laws. Let not the size of the vehicle population affected delay you from doing what you would do quickly were less than a million cars or a smaller company involved. This is a design defect recognized by GM's subsequent redesign of the replacement part (a most obviously neglected redesign even by 1964 state of the art) which it is selling to those with cars that suddenly drive themselves.

I urge you to immediately order General Motors to notify owners of over 5 million Chevrolet automobiles of the defective motor mount design, pursuant to a vehicle defect recall campaign. In addition, your investigation should extend to other GM models, especially Buicks, to determine whether a similar design defect prevails.

Sincerely,

RALPH NADER.

NOVEMBER 24, 1971.

Hon. JOHN VOLPE,
Secretary of Transportation,
Washington, D.C.

DEAR MR. SECRETARY: For over two years the National Highway Traffic Safety Administration (NHTSA) has been investigating defective engine mounts on Chevrolets, first on 1968 models, then on 1969 models, and most recently on 1965–1969 models. This matter came to my attention this summer when I received several consumer complaints describing the catastrophic consequences of broken engine mounts: a jammed accelerator, disengaged power brake vacuum hose, and in some cases a locked gear shift lever. The NHTSA was alerted to our concern on July 18, 1971, by Mr. Clarence Ditlow of my staff, and again on September 1, 1971, by my comprehensive letter to Mr. Douglas Toms, NHTSA Director.

The September 2 letter generated many letters from people who had experienced this defective behavior in Chevrolets and other General Motors cars. It also generated interest in further news stories which appeared throughout the months of October and November. Notable is the series by Mr. Robert Irvin which appeared in the Detroit News. As a result, I have received over 300 complaints concerning broken engine mounts on GM cars, mostly Chevrolets; Mr. Irvin has also received in excess of 300 complaints; the NHTSA has received at least 200 directly plus copies of hundreds of others; and General Motors has received at least 1500. The scope of the problem is also revealed in the statistic quoted from General Motors in early October 1971 that they had replaced under warranty alone some 100,000 engine mounts on 1965–1969 Chevrolets.

In recognition of the defective design of the Chevrolet engine mount, General Motors late in 1969 redesigned this item to include a metal interlock between the portion connected to the automobile's engine and the portion connected to the auomobile's frame. This interlock prevents complete separation of the mount in the event of its failure, and precludes the possibility that the car will run amok, out of control, due to the failure. General Motors also recalled all of the old style mounts available on their dealers' shelves as replacement parts and substituted instead the newer, interlocking, type. The warranty for engine mounts on 1968 and 1969 models was unofficially extended beyond its normal duration, also

[1] The Detroit News, October 1, 1971: " 'I think the complaints are legitimate,' he said. 'We are now pursuing this investigation vigorously to determine if we have enough evidence to have a defect recall.' "

The New York Times, October 10, 1971: "Douglas W. Toms, who heads the National Highway Traffic Safety Administration, said in a telephone interview that within days his agency will issue a consumer warning bulletin on the engine mount problem. He said he has already approved the bulletin."

in tacit recognition of the defect inherent in the design and construction of the engine mounts.

General Motors could have learned of this defect from at least two sources: First, the NHTSA, in response to a consumer complaint letter dated September 27, 1969, from Mr. Charles Combe, sent Information Request number 162 to General Motors on October 20, 1969. The letter questioned the company on the possibility of engine mount failure, and asked if General Motors had also received any letters concerning the defect on other 1968 Chevrolets. In its response of November 26, 1969, General Motors admitted the possibility of a defect, said that it had received fourteen similiar complaints on engine mounts with jammed accelerators, but concluded that the problem could occur only under unusual circumstances and in limited numbers. The problem of jammed accelerators was not unknown to General Motors. At least one precedent was set in February 1969 when General Motors recalled 2.5 million cars with the defective fast idle cam on the Quadra jet carburetor which was causing the accelerator to jam. (It is interesting to note that there were only 48 known cases of failure at the time of this recall.)

General Motors also learned of the engine mount defect from accidents involving these Chevrolets. For example, in June 1969 a 1969 Chevrolet sedan driven by an active 68 year old woman with her husband and two grandchildren as passengers, suddenly, and without warning, accelerated out of control on a Boston street. It collided with a telephone pole after the woman maneuvered so as not to strike other cars on the road. The woman suffered a skull fracture which has caused her permanent blindness prematurely ending her very successful professional career as a real estate agent. The car was sold by the insurance company to a junk dealer, who promised to sell it to her attorneys for $500. This sale was never consummated, however, because the car was acquired instead by the Royal Globe Indemnity Company, a company which insures General Motors. Although the car has now been examined by the plaintiff's attorneys, certain key parts, such as the engine mounts, were found mysteriously to be missing.

In October 1969, a Michigan woman was driving a new Camaro when it began to accelerate wildly out of control. The car spun around and was struck by another car in the right rear. The driver was injured, and her passenger killed. It was found that the engine mounts were broken.

After receiving the November 1969 reply from General Motors, which should have sparked further interest and questions in the engine mount investigation, the NHTSA engineers recommended in June 1970 that the investigation be discontinued because of the small number of complaints. Apparently no further attempt was made to determine the nature or the extent of the defect and its effect on vehicle safety. General Motors, in flagrant violation of the National Traffic and Motor Vehicle Safety Act of 1966, did not inform the NHTSA of other instances of engine mount failure in 1968 Chevrolets or other Chevrolets of similar design which subsequently came to its attention and did not initiate a safety defect notification campaign. They did, however, act in late 1969 to substitute the interlocking mount on the production line for the defectively designed mount.

During the intervening two years thousands of motorists have been frightened by the spectre of their cars suddenly roaring forward at full throttle with the brakes considerably reduced in effectiveness, and the gearshift jammed. Most were lucky to have been only frightened. The unlucky ones crashed, suffering property damage, injury and death. Both General Motors and the Department of Transportation share in the responsibility for this tragic situation in which the toll of human suffering is being needlessly expanded.

In November 1970, a 1969 Impala sped out of control in a wayfully reminiscent of the 1969 Camaro case in Michigan. In this case, however, the driver was lucky to have sustained only major property damage as her car plowed into the guard rail separating the lanes of the highway.

In April 1971, two high school girls in Los Angeles, California, were crushed between a parked car and a runaway Camaro—a car on which the engine mount had broken causing the loss of control. In May, a service manager of a McAllen Texas Chevrolet garage was reving up the engine of a 1967 Chevelle from under the hood, in an effort to determine the source of the strange underhood noises. The car was in neutral, and the emergency brake was engaged, but when the mount separated, the car was pulled into gear, and lept forward, pinning the man between that car and the car ahead of it in the shop. In September, perhaps the most tragic accident of all occurred in the Virgin Islands. A 1968 Camaro convertible in which four children were being driven to school went out of control and crashed, killing all of the children. The car's engine mounts were found to have broken, causing the accelerator to jam open so that the driver, the mother

of three of the children, could not control the car. Last month in Richmond, Virginia, a 1969 Camaro went out of control after the engine mounts broke and crashed into a telephone pole. The passenger in the car is now a paraplegic as a result of his injuries. The owner had experienced engine mount failure previously, and after replacing the mounts had added a chain to prevent the engine from raising off the mounts should they break again. However, the force of the engine on its mountings was sufficient to break both the mount and the chain. Even more recently, a driverless runaway 1967 Chevrolet in Laredo, Texas, crashed completely through a school classroom, injuring 32 children, six so that they required hospitalization, and one critically. The car's engine mounts broke, causing the car to slip into gear and the accelerator to be held open, even though there was no one in the car as it sped into the school building.

These are examples of failures known to us. There are undoubtedly many more unknown not only to us, but to owners as well. Indeed, most owners have stated that they initially thought the problem with their car was unique. How many times must these incidents be repeated before the Department acts?

When the Congress passed the National Traffic and Motor Vehicle Safety Act in 1966 the intent was to protect the public against the kind of corporate irresponsibility demonstrated by General Motors in the engine mount disaster by investing an agency of the government with substantial corrective power. Congress provided that, in the event of a refusal of a motor company to notify owners of safety defects, you are empowered to have such defects investigated, and to order the manufacturers to notify owners. Although you have delegated this function to the NHTSA, Office of Defects Investigation, their excessive tardiness in this case and callous disregard for the safety of owners and passengers of these defective vehicles makes it incumbent upon you to personally review the issues immediately so that owners of these cars may be notified by certified mail in accordance with the statute. In my opinion, this investigation has not been concluded within a reasonable time within the meaning of the Administrative Procedure Act.

Under the pressure of your action and complaints from thousands of owners, General Motors might also be awakened to their responsibility to repair the the remaining defective Chevrolets at their expense. Time is of the essence. You must act to halt the spread of this mechanical epidemic which may afflict as many as one in ten cars now on the Nation's highways.

Sincerely,

RALPH NADER.

DECEMBER 6, 1971.

Hon. JOHN VOLPE,
Secretary of Transportation,
Washington, D.C.

DEAR MR. SECRETARY: Although General Motors has at last agreed to recall some of its Chevrolet built cars and trucks for repair of the design defect in their engine mounts, it has publicly refused to agree that the defect is safety-related. GM is setting new policy for itself and for the National Highway Traffic Safety Administration (NHTSA) in both this case and its recent defect notification to Corvair owners of carbon monoxide leakage from their heaters. In both cases, GM claims that although no safety-related defect exists, owners will be notified of the problem to quiet misleading publicity. GM's position is clearly inconsistent with § 113 of the National Traffic and Motor Vehicle Safety Act of 1966 under which defect notifications are issued.

This issue was recently analyzed for the NHTSA by Mr. Clarence Ditlow in his December 3 letter to Mr. Douglas Toms, Administrator of the NHTSA, concerning General Motors' denial of a defect in the Corvair heater. As Mr. Ditlow explained, such a denial of a defect in the defect notification letter to owners effectively nullifies any fulfillment of the statutory requirements as, "[t]he qualifications and language contained in the letter written by General Motors were calculated to decimate the very purpose of the letter, i.e. to warn owners of a serious safety defect."

The law, 15 U.S.C. § 1402, clearly states that a defect notification must contain, "a clear description" of any defect which has been discovered in a motor vehicle and which relates to motor vehicle safety, "an evaluation of the risk to traffic safety reasonably related to such defect," and "a statement of the measures to be taken to repair such defect." On May 14, 1971, Mr. Toms informed General Motors and other manufacturers by letter of the inadequacy of previously written defect notification letters both in their providing "the

desired incentive in owners to have vehicles repaired," and in their failure to meet the requirements of § 113(c). Mr. Toms' letter included specific recommendations to bring future notifications into compliance with the law. Scant attention and even less compliance has been accorded these guidelines. Even stronger regulations should be proposed along these lines with penalties for failure to comply.

In view of General Motors' consistent and persistent efforts to circumvent the requirements and intent of the law, this letter requests five actions by the NHTSA to assure that owners of defective Chevrolets are afforded the full measure of protection required by law:

1. To forestall the possibility of owners being misled about the seriousness of this defect in their engine mounts, that the NHSTA inform GM that a notification letter containing a denial of the safety hazard of the defect does not comply with the requirements of the National Traffic and Motor Vehicle Safety Act of 1966.

2. That I and any other persons interested in this investigation be granted the opportunity to submit comments to the NHTSA on the technical and legal adequacy of the proposed notification letter from GM to Chevrolet owners.

3. That the NHSTA make a formal finding of a safety defect in all Chevrolets in which a safety hazard exists as a result of breakage of any of the engine mounts. This would include Chevelles, Corvettes, and six-cylinder Chevrolets in addition to those being recalled.

4. To protect owners of defective Chevrolets in the interim between now and the end of February when General Motors says the cables to tie up the engine to the chassis will be available, that the NHSTA require General Motors to send the defect notification at the earliest possible moment and a followup notice at the time the repair can be effected. The first notice should inform owners in detail about the actual hazards associated with engine mount failure (which GM has refused to do thus far), the procedure to be followed in the event the engine mount fails, and that engine mounts will be replaced at any time in the interim free of charge with mounts of a safer design at the option of the owner.

5. That the NHTSA make public the test information which was the basis for its approval of the proposed repair for the engine mount deficiency.

The National Traffic and Motor Vehicle Safety Act of 1966 must be rescued from the damage done to it in the past by the NHTSA's acquiescence to GM's assaults in the Kelsey-Hayes case, the Vega informal recall case of April, 1971, and the Corvair heater case. These episodes point to a serious de facto weakening of the act which must be reversed. The NHTSA must assert its authority to make a finding of defect in the engine mount investigation, and then to require General Motors to issue a defect notification which is in actual compliance with the law.

Sincerely,

RALPH NADER.

MARCH, 31, 1972.

DOUGLAS TOMS,
Administrator, National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C.

DEAR MR. TOMS: The negligence of the National Highway Traffic Safety Administration (NHTSA) in initiating and conducting investigations into fire-related motor vehicle defects is simply incredible. The painfully slow rate at which the NHTSA pursues fire-related defect investigations is matched only by the agonizingly protracted death of victims of vehicle fires.

The pending defect investigation on Rochester Quadrajet carburetors on 1965–1966 General Motors vehicles dates back to November 27, 1967. Although this investigation was placed in an active status for a third time in response to my September 1, 1971, letter to you, there has been no observable recently activity to denote progress in the investigation. Since that September 1, 1971 letter, my associate, Clarence M. Ditlow, has forwarded to the NHTSA 6 complaints on Rochester Quadrajet carburetor plug failures, 4 of which involved fires. Enclosed with this letter is a complaint from Mrs. June C. Heckenlaible describing a Rochester Quadrajet plug failure and ensuing fire on a 1966 Buick and a plug failure on a 1967 Camaro. How many more fires and years are needed before the NHTSA acts on this defect?

In contrast to the inaction of the NHTSA is the activity of the Automobile Club of Southern California (ACSC) which suggests modification of Rochester Quadrajet carburetors on all post-1965 General Motors vehicles. (See enclosed

letter of Michael Appleby and Auto Club News Pictorial article.) The insurance division of the ACSC has been litigating and winning product liability suits against General Motors on these Rochester Quadrajet carburetor fires. If the ACSC can sustain the burden of proof to win these lawsuits, then cannot the doubly well-funded NHTSA sustain the burden of proof necessary to find a safety-related defect in these same carburetors?

The second most ancient fire-related defect investigation is on the original equipment gas on the 1961 through 1967 Volkswagen (VW) which was initiated in August 1968 and closed on March 25, 1970. On June 24, 1971, I asked you to reopen this investigation on the basis of new evidence including pertinent barrier crash tests concealed from NHTSA by Volkswagen of America. On July 9, 1971, you referred to reopen the investigation because "using all available known data, there was no indication that pre-1968 VWs were more susceptible to crash fires than other foreign and domestic passenger vehicles." On September 21, 1971, I requested reconsideration of your refusal because the available data actually indicated the fire crash rate for 1961 through 1967 VWs was significantly greater than that for other foreign and domestic passenger vehicles. On October 29, 1971, your deputy, Dr. Charles Hartman responded by agreeing to reopen the VW gas cap investigation for high-level reconsideration which would take several weeks. After the passage of almost two months without any apparent action, Mr. Ditlow wrote Dr. Hartman on December 20, 1971, asking about the progress of the reconsideration. To indicate the deadly seriousness of the matter, enclosed in the December 20 letter was information on 10 deaths and 3 serious injuries in 7 fire crashes of 1961 through 1967 VWs along with information on 2 deaths in 2 fire crashes of unknown model years.[1] (Please note that the 10 known deaths exceed the number of known deaths associated with the Chevrolet engine mount failure.) On January 17, 1972, Dr. Hartman responded that the review would me completed in the near future. Some 2½ more months of inaction have passed so that the first year anniversary of my request for reopening of this investigation is approaching. How many more people have to die before the NHTSA will act?

The inordinate sluggishness of NHTSA fire-related defect investigations is matched apace by NHTSA unwillingness to initiate such investigations. Described below are two situations involving fires in late model vehicles in which the NHTSA has not yet initiated an investigation. How is it that public interest groups with exceedingly limited resources have been more adept in discovering potential defects such as these than has the multi-million dollar NHTSA?

The first situation involves the 1972 Chevrolet Vega with a Rochester carburetor. The vehicle is said to catch fire for the following reasons. The screws holding the top cover to the carburetor body are fastened with an automatic tool. The locking means (a high friction chemical) between the bolt heads and the cover causes premature engagement leaving the cover loose. Excess air then enters the carburetor between the loose top cover and the body or between the carburetor and manifold creating a lean fuel mixture. This causes the vehicle to backfire which in turn blows out the muffler. A fuel line is in close proximity to the point at which the muffler comes apart which carries fuel under pressure to the engine. The high temperature of exhaust gases causes the fuel line to rupture and further backfiring will ignite the gasoline. In fact, numerous 1972 Vegas have met their demise in this manner. General Motors Corporation is aware of this problem and has apparently determined that this problem and any damaged caused thereby is the fault of the Rochester Products Division of the General Motors Corporation. General Motors issued oral instructions to dealers in January or February 1972 to carry out an informal recall by correcting this defect in all Vegas brought into dealers. In violatoin of § 113 of the National Traffic and Motor Vehicle Safety Act of 1966, this communication was not furnished to the Secretary of Transportation.

Two cases in point are those of William Kettner of Box 301K, RD No. 2, Harpers Ferry, West Virginia 25425 and Charles R. Perkins of 3392 Sudlersville South, Laurel, Maryland 20810. Mr. Ketner's 1972 Vega Hatchback had the muffler blow out from the repeated backfiring. On January 9, 1972, his Vega went up in flames from a fire originating at the gas tank from a backfire. On March 26, 1972, Mr. Perkins' Vega Kammback suffered a similar demise after the muf-

[1] The NHTSA's wanton disregard for human life in this investigation is illustrated by the response by the agency to the December 20, 1971 letter. Our letter noted 3 crashes of unidentified model year VWs and suggested the NHTSA contact the parties involved to determine the model year. On March 30, 1972, attorney Floyd Morgan who had written the information on one of these 3 crashes told Mr. Ditlow that the VW in which 4 occupants were cremated was a 1966 model and that *the NHTSA had never bothered to contact him to find out that information.*

fier blew out from repeated backfiring. General Motors has already offered to reimburse Mr. Ketner for his loss. As you are well aware, General Motors is only willing to absorb such losses where the liability is clear.

The second situation involves 1969 through 1971 Fords, particularly LTDs. Over the past year, staff members from the Public Interest Research Group and the Center for Auto Safety have sent the NHTSA 11 letters describing fires in 9 LTDs, 1 Torino and 1 Cougar.[2] Enclosed with this letter is a letter from Earl Steltz of Glenbeulah, Wisconsin on an additional 1971 LTD fire.

The similarity of these fires is too great to suggest anything other than a common defect causing them. While parked in driveways and garages and while driven along highways, these Ford vehicles burst into flames originating in the engine compartment without warning. The parked vehicles have even burst into flames up to several days after being driven. The number and similarity of these reported fires is of sufficient probative value to require the NHTSA to immediately initiate a defect investigation into this problem. The Ford Motor Company has noted that "we are usually aware of product problems long before we begin to receive significant numbers of complaints directly from owners through either our own engineering tests or early product problem reports from the field organization." [3] The NHTSA through its information discovery powers should obtain any data indicating Ford's knowledge of this problem and its causes.

I look forward to your *prompt scrutiny* of these alleged hazardous defects with the full authority and data possessed by the NHTSA to verify these problems.

Sincerely,

RALPH NADER.

(The following information was subsequently received for the record:)

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., August 1, 1972.

Hon. WARREN G. MAGNUSON,
Chairman, Senate Commerce Committee,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: The purpose of this letter is to bring to your attention two inaccuracies contained in Mr. Nader's statement made before the Senate Commerce Committee's Hearing on the Federal Motor Vehicle Safety Program on July 25, 1972.

The inaccuracies appear in the last paragraph on page 3, continuing on page 4.

This particular paragrah states that "Messrs. Mervyn Lilley and Svein Larsen of the NHTSA, gentlemen of no articular reputation in the field of vehicle dynamics, designed and supervised the tests."

The two inaccuracies referred to in the subject paragraph are:

1. Mr. Svein Larsen did not "design and supervise the tests", and

2. In regard to "no particular reputation", I wish to point out that I have worked in the field of vehicle dynamics since February 1954 in various professional capacities, the latest being Supervisor, Suspension and Steering Development, American Motors Corporation, before joining the Administration in 1967.

It would, of course, also interest me to learn from which sources Mr. Nader gets the information upon which he makes such statements as contained in the subject document.

In view of the damage done to my professional reputation, I request that you seek to have the Committee either expunge my name from the subject document or, as an alternative, that this letter be attached to, and made part of, the document.

Sincerely,

SVEIN I. LARSEN,
Senior Staff Member, Research Institute.

---

[2] Since these letters have all been available to the NHTSA for a long period of time and presumably have been entered into your computerized information and retrieval system, the question arises as to why the NHTSA did not discover this remarkable trend of defects? Have you not yet had the computer programmed to conduct searches for defect trends? The Center for Auto Safety has corresponded with the Office of Defects Investigation as far back as July 1971 on improved utilization of the NHTSA computer resources. We had presumed that the computer was being used to search for possible defect trends because the November 16, 1971 letter from Mr. Joseph Clark to Joan Claybrook stated: "To reinforce the present periodic review of information in the computer file, a computer program to interrogate this file and summarize possible trends is being written. This program will be run monthly."

[3] November 9, 1971 letter from P. E. Benton, Jr., Vice-President-General Manager, Ford Customer Service Division to Mrs. Virginia Knauer.

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., August 3, 1972.

Mr. RALPH NADER,
Washington, D.C.

DEAR MR. NADER: This responds to your letter of July 17, 1972, to Mr. Toms, in which you comment on various aspects of our activities. For ease of reference I have arranged our replies in the same order as the comments contained in your letter.

1. I understand your feelings and share your disappointment that highly effective passive restraint systems are not available to the purchasers of new cars today. We are, however, moving with all possible speed to require passive restraint systems within the limits of the rapidly advancing technology and without causing undue economic hardship on the automobile industry and the buying public.

Our plans to launch fleet tests of cars equipped with air bags are progressing well. We are currently acquiring the initial fleet of 125 Mercury Monterey cars equipped with air bags for testing in the Federal Government's General Services Administration fleets. These cars will be delivered to the test locations in early August and testing will begin shortly thereafter. Negotiations are currently underway with General Motors to supply 1973 Chevrolet cars equipped with air bags for the driver and front seat passenger in the fall of this year. We plan to place at least 5,000 of these vehicles in both government and private fleets in the near future. It is highly desirable to utilize production air bags systems installed in vehicles by the vehicle manufacturer for fleet testing. This will assure that fleet test results will be valid and provide the most accurate possible reflection of performance that can be expected of these systems in the future.

2. An Advance Notice of Proposed Rule Making entitled "Automatic Braking Systems" was issued on July 21, 1972. A standard based on this Advance Notice would require a system that would apply the vehicle's brakes without effort on the part of the driver when the required system senses a hazardous obstacle in the vehicle's path.

3. We have actively supported extensive research on pedestrian injuries caused by motor vehicles. Our efforts to date have primarily been attempts to understand the pedestrian collision event through accident investigation efforts. Although valuable information has been obtained, the complexity of the pedestrian accident and the difficulty of retrieving information about the pedestrian collision after the fact, has made it difficult to define countermeasures for preventing injuries. The research program in this area is being expanded substantially to develop and utilize other techniques for studying pedestrian collisions. We know of no easy answers to this important problem and have placed high priority on efforts to search for and investigate possible solutions.

Our rulemaking plans call for standards that treat the small car/large car problem when the required levels of occupant crash protection are increased to the 50 miles per hour range. Research activities in both the ESV and other research and development programs are investigating various possible techniques for solving this problem and attempting to develop practical requirements and compliance test procedures to assure that the desired performance is achieved. This is currently beyond the state-of-the-art and we are hopeful that our research activity will provide solutions that support these rulemaking plans.

Standard No. 213, Child Seating Systems, requires static testing to assure the basic structural integrity of the seat. It was recognized and stated in the preamble at the time of issue (March 26, 1970) that more complete tests of child seats, probably dynamic tests, were necessary. In October 1970, a report from the Highway Safety Research Institute, University of Michigan, recommended that dynamic tests of child seats be developed and posed several questions that needed resolution before such a dynamic test could be required. These included the development of anthropomorphic data for children, the development of appropriate test devices to stimulate children in dynamic tests, and the determination of child injury thresholds for evaluating the performance of child seats in dynamic tests. In July 1971, a contract was granted to the Highway Safety Research Institute, University of Michigan, to proceed with the detailed development of a dynamic test procedure for child restraint systems. Other research efforts are also underway in support of this development. Rulemaking action requiring dynamic tests of child restraint systems is planned based on the results of these various research projects. We are hopeful that the actual results of these research programs will support this rulemaking action.

On July 8, 1972, an NPRM covering minimum performance standards on tires for vehicles other than passenger cars was issued. The comment period extends until October. Thereafter the rule covering all highway tires for vehicles other than passenger cars will be issued. When this rule becomes effective, Federal regulations will be in existence for all types of tires including new and retreaded passenger car tires as well as new tires for trucks, buses, multipurpose vehicles and motorcycles.

As you know, FMVSS 121, Air Brake Systems, applicable to trucks, buses and trailers, was issued on Febraury 19, 1971. In addition, FMVSS 105, Hydraulic Brake Systems, will be amended in the immediate future and will extend applicability to trucks, buses and multipurpose passenger vehicles.

Regarding motorcycle standards, FMVSS No. 122, Motorcycle Brake Systems, was issued on March 2, 1972, and FMVSS 123, Motorcycle Controls and Displays, was issued on March 4, 1972. FMVSS No. 108, Lighting, currently applies to motorcycles. Additional motorcycle performance requirements are included in our future rulemaking plans.

Development of new and revised standards in the areas of visibility and lighting has been a most complex and time-consuming undertaking. This is particularly true of the research required to support proposed new or revised requirements and the development of cost-effectiveness data to justify such requirements. From a review of the data it was apparent that many of the research findings and effectiveness values were based on subjective evaluations. Our subsequent research programs in these areas were, therefore, specifically structured to provide valid data in direct support of the more critical proposed requirements. The magnitude of this task is evidenced by the completion of 9 major research contracts in the visibility area and 10 contracts in the lighting area. Additional follow-on contracts in each area are in progress and will be completed in early 1973. Our staff is currently reviewing and analyzing results of the research completed to date. This analysis, plus results of current research and an evaluation of the voluminous comments received in response to prior notices, will provide us with a valid basis for issuing more realistic and effective standards in the future. Our target date for issuance of the final rule on "Fields of Direct View" (Docket 70–7) is May 1973. A Notice of Proposed Rule Making on the lighting standard (FMVSS No. 108, Docket 69–19) is scheduled for issuance in October 1972. This major and far-reaching amendment of FMVSS No. 108 will propose new requirements for improved headlighting which will provide seeing distances consistent with speed capabilities of modern vehicles.

4. A Notice of Proposed Rule Making which removes motor vehicles weighing 1,000 pounds and less from exemptions to our Federal Motor Vehicle Safety Standards was issued on July 24, 1972.

Of the thirty-seven (37) Federal Motor Vehicle Safety Standards that are applicable to passenger cars, twenty-two (22) are also applicable to MPV's and fifteen (15) are applicable to trucks. Our rulemaking plans extend applicability of twelve (12) more of our passenger car standards to MPV's and fourteen (14) to trucks.

5. At present we are planning to upgrade the existing Consumer Information Regulations on both Stopping Distance and Acceleration and Passing Ability to make them more meaningful both in terms of the information presented to the consumer and in terms of information that will be useful to the NHTSA in future rulemaking activities. Since the Consumer Information test procedures for stopping distance must be compatible with those in the forthcoming Amendment to existing Federal Motor Vehicle Safety Standard No. 105, Hydraulic Brake Systems, the revised Consumer Information NPRM will be issued within the next few months. The amendment to the existing regulation on Acceleration and Passing Ability is presently in process. Both Consumer Information Regulations will be more comprehensive in scope, and will, in so far as is practicable, relate more readily to real world situations.

High priority has been assigned and continues on our efforts toward a meaningful Uniform Tire Quality Grading System. Our plan called for a two-phase rulemaking approach. Phase 1 included high speed, endurance, strength and uniformity/balance. Phase 2 would add traction and treadwear. A Notice of Proposed Rulemaking covering Phase 1 was issued in September 1971. Based on comments to the docket, a Technical Meeting held in November 1971 and progress in our treadwear and traction research efforts, a decision has been made to proceed directly into Phase 2. A Notice of Proposed Rulemaking, incorporating the important parameters of treadwear, traction and high speed performance, is scheduled for issue in August 1972.

6. NHTSA research has shown that defective mechanical systems, subsystems and components cause or contribute to, 6 percent to 23 percent of the automobile accidents on our highways. Of this 6 to 23 percent, approximately 80 percent involved brakes, steering, suspension and tire systems. This research data has provided the basis for the Vehicle-in-Use Program Plan. Although limited to the above four systems at the present time, it does not preclude the addition of other areas where research data demonstrates possible safety payoff. Nor does it prevent the individual states from adding areas which are deemed important to their safety efforts. Furthermore, the Program Plan calls for the specification of "criteria and procedures which will determine if safety features required by Federal Motor Vehicle Safety Standards have been removed or altered in such a manner as to render them inoperable or ineffective." The present Vehicle-in-Use Program Plan is based on valid research data, is aimed at areas of potential safety payoff, provides for on-going evaluation and is consistent with available resources.

7. Since our initial invesigation into the need for standards on school bus body structures, new structural techniques have emerged that appear to offer potential improvements in school bus construction, at little or no additional cost. We have, therefore, initiated an investigation to determine if school bus structural integrity standards are appropriate at this time. We will notify you of the results of this investigation in the near future.

The NHTSA has conducted studies of injury modes in school bus crashes. Full-scale crash tests were conducted by the University of California, Los Angeles, under contract FH–11–6971, School Bus Seat Restraint. From this and other work on this problem, it is evident that by preventing ejection from the bus, and providing a passive protection system including well-padded, high-backed seats, we can eliminate or greatly reduce the severity of most injury modes.

We have already taken action to prevent ejection in the form of Federal Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release. Occupant crash protection systems for buses will be required in a rulemaking action that is in the final stages of preparation. These standards will provide a high level of crash protection in most school bus crash situations, and will emphasize fully passive protection.

Seat belts in buses, combined with properly designed seats, could also provide a high level of crash protection. However, in school buses, the addition of sufficient structures to support seat belt forces require substantial modifications, and there are problems of seat belt usage and vandalism relative to belts.

Further problems arise because of the broad range of sizes of school bus occupants and variations in seat occupancy patterns. The padded encapsulation approach first mentioned above may be more effective in most cases. In some situations the belt system may well prove to be more desirable. An option to fully passive protection is being considered in the bus occupant protection standard which would require seat belts combined with a sensing and warning system to assure that the belts are used.

Regarding brake system standards, as mentioned earlier FMVSS No. 121, Air Brake Systems," which is applicable to trucks, buses and trailers was issued on February 19, 1971. In addition, Standard No. 105, Hydraulic Brake Systems, will be amended in the immediate future to extend applicability to multipurpose passenger vehicles, trucks, and buses. Both of these standards will significantly increase the level of brake system performance in the areas of stopping distance, fade and wet brake recovery.

8. A failure recorded as part of the compliance test program does not, in itself, establish noncompliance for a line of vehicles or equipment items from which the failed sample was drawn. In addition, and particularly so relative to such items as tires and seat belts, multiple failures within a product family resolve into a single investigation with its ensuing single notification and civil penalty action in the event that noncompliance is confirmed.

Constraints of contracting budgets and in-house manpower, recognizing the needs of other priority areas, limit the penetration of the compliance universe in terms of statistical significance. However, by Congressional mandate, the Act clearly establishes the self-certification responsibilities of the manufacturers relative to product compliance. Standards enforcement testing is seen as an overview surveillance activity designed to encourage industry, itself, to improve their own level of quality stewardship as it relates to compliance with Federal Motor Vehicle Safety Standards (FMVSS). Recognizing the NHTSA commitment to a systems approach to motor vehicle standards, rest assured that the systems approach will

be transposed in terms of enforcement testing when the standards forming the basis for that approach are, themselves, implemented.

Refinement of compliance test procedures is a continuing requirement in the development of new standards and in upgrading current standards.

9. As your comment indicates, the imposition of a tight employment ceiling explains our high vacancy rate. However, the employment plan developed for the utilization of the reduced ceiling did specifically call for filing the two key positions referred to. Finding available talent to fill specialized high level supergrade positions within NHTSA has been a continuing problem. In the case of the vacant position of Associate Administrator for Research and Development, to date recruiting efforts have not produced an acceptable available candidate. NHTSA has conducted three separate searches through the Civil Service Commission's Executive Inventory (January 1969; August 1970; and April 1971); continually combed known research institutions and contacts; conducted a formal campaign through selected sources (July 1971); and is now interviewing a selection of candidates referred through the Department. In the case of the Associate Administrator for Motor Vehicle Programs, NHTSA recommended a candidate to the OST in October 1971; the Civil Service Commission completed its processing in April 1972 and the position was formally filled on April 30, 1972.

10. Exception is taken to your concept of relating pendancy time of ongoing defect investigations as the basic criteria for assessing performance. Performance in this area is measured by results and the influence of our defect investigations on industry. The upswing in recall campaigns, 87 percent of which are voluntary (50 percent of the number of vehicles) indicates there is a very real recognition of the existence of our safety defect investigation function. Recognition by the press in recent months of the increased recall activity of the industry confirms this conclusion. It is believed that this leverage is far more important than statistics on the time consumed in a particular investigation. In any event, there are other time considerations. Our investigative activity, for example, frequently requires lengthy periods of laboratory testing, the results of which, in turn, indicate the need for additional similar effort if we are to gather the factual and evidentiary data needed to successfully confront the manufacturer.

As you are now aware, the NHTSA report of findings in the Corvair handling and stability investigation was published on July 21, 1972. The results of the NHTSA investigation into alleged lower control arm failures in 1965–1969 Ford passenger vehicles will be made public at such point in time as all logical inquiry has been completed. Persistent rumors to the contrary should be discounted.

Thank you for your continuing interest in motor vehicle safety.

Sincerely,

ROBERT L. CARTER,
Associate Administrator, Motor Vehicle Programs.

CENTER FOR AUTO SAFETY,
Washington, D.C., July 18, 1972.

CENTER FOR AUTO SAFETY RELEASES INSIDE INFORMATION ON FORD LOWER CONTROL ARM, ASKS IMMEDIATE RECALL

The Center for Auto Safety, citing inside sources, asked Henry Ford II, Chairman of the Board of the Ford Motor Company, to recall all 1965–69 full sized Ford products for replacement of the defective lower control arms.

Breakage of the control arm, a vital steering and suspension component, is due primarily to the thinness of the metal and the stamping process used to produce the part. The arms commonly fracture in the region of the lower ball joint rivet holes, allowing a front wheel to become suddenly detached from the car. Often the car goes violently out of control, possibly resulting in a serious crash. Affected are 1965–69 Ford Galaxies, Customs, LTDs, and station wagons, 1968–69 Thunderbirds and 1965–69 Mercury Montereys, Montclairs, Parklands, Marquis, Broughams and station wagons.

The Center released information on separate contacts with two former Ford employees who worked on the design of the arm. These engineers verified each other's account that Ford's chief engineers overruled objections and decreased the arm's thickness specification from the proposed .156 inches to the final .125 inches. This was reportedly a cost benefit decision, "sacrificing safety for pre-

sumed dollar profit," according to the safety group. The Center noted that "strong objections to this decision was voiced in 1962 and 1963 including notice to you personally that the arm was unsafe."

The Center was informed by a third reliable source that Ford has spent hundreds of thousands of dollars to cover up this defect. The Center said "In a tacit admission of the defect—and proof that Ford has already produced a fix—the company has retracted from its dealers' stock all the original design control arms, substituting in their place a thicker part."

Enclosed with the Center's letter were 13 letters describing possible control arm failures. These added to the 89 consumer complaints forwarded to the National Highway Traffic Safety Administration since the Center began working on the problem nearly two years ago. During that time the group received reports of 6 deaths and 29 injuries allegedly associated with lower control arm failures. A tabulation of these instances and copies of the letters were sent to Ford. However the group noted that most of the cases it received involved failure at low speed, on smooth roads, without impact with a pot hole or curb. The Center said: "This raises the question of how many lower control arm failures are unreported because they occurred at higher speeds and caused serious crashes—the arms now buried, like the crash victims, in auto graveyards."

The Center disagreed with Ford's news releases about its two most recent recalls, which claimed that the company was willing and able to stand behind its products. The group called on Henry Ford, personally, to recall all Ford products equipped with the defective control arms. "Until then," the Center said, "your public pronouncements of concern for motorists' safety and of willingness and ability to stand behind your products remain totally—and tragically—vacuous."

The full text of the letter is attached.

For further information contact Lowell Dodge, 638–0420.

Senator HARTKE. Thank you.

I want to say to Mr. Harley Copp that I apologize for not getting his testimony in. It's now 1:20. We will recess until 2:30, at which time Mr. Harley Copp of Ford Motor Co., who is directly concerned with these matters, will be heard.

(Whereupon, at 1:20 p.m., the hearing was recessed, to reconvene at 2:30 p.m., this same day.)

AFTERNOON SESSION

Senator HARTKE. Mr. Harley Copp of the Ford Motor Co. is our witness this afternoon.

STATEMENT OF HARLEY COPP ON BEHALF OF THE FORD MOTOR CO.

Mr. COPP. Mr. Chairman, members of the Senate Commerce Committee, I thank you for this opportunity to comment on the oversight of the 1960–63 Ford Corvair handling stability. I apologize for not having copies of what I am going to say today. I will have them available tomorrow.

I received a copy of the report only Saturday noon and I completed it last night.

Senator HARTKE. You may proceed.

Mr. COPP. My name is Harley F. Copp. Although I am employed by the Ford Motor Co., I am here today by invitation of this committee and not as a representative of the Ford Motor Co.

I live at 22179 Long Boulevard in Dearborn, Mich., and have been responsible for the design and development of motor vehicles for over 21 years of my 26-year employment in the Ford Motor Co.

I have been an executive since 1955 and I have had the direct or indirect responsibility for designing and or developing approximately 110 vehicles including the 1960 Falcon.

My positions have ranged from director of Lincoln engineering, to director of car engineering for Ford, Europe, as a member of that governing board during 1956–57. I am an honorary member of Phi Tau Sigma National Honorary Engineering Society and have worked in all phases of automotive engineering.

My current responsibility is director of engineering, Technical Services Office of the Ford Motor Co.'s Product Development Group. My duties include the direction of some 1,150 salaried employees and 90 hourly employees.

My current position was established in August 1970. Today I would like to say my comments, conclusions and recommendations on the U.S. Department of Transportation's report entitled "Evaluation of the 1960–63 Corvair handling and stability," dated July 1972, and its collateral report entitled "Panel Evaluation of the NHTSA Approach," dated January 25, 1972, and amended June 6, 1972.

I wish to place particular emphasis on first the method of testing and evaluation of the results, second, the credibility of the Ford film showing the comparison of handling characteristics of the 1960 Ford Falcon on the 1960 Corvair because the report states "it is concluded that Mr. Copp's analysis is not a valid evaluation of the handling characteristics of the 1960 Corvair."

Third, recommending a simple, honest and direct approach to arrive at the truth of this issue, the method of which is endorsed by General Motors under oath in part four of the March 26, 1966, hearings before the Subcommittee on Executive Reorganization of the Committee on Government Operations, U.S. Senate.

Fourth, providing the committee with important documents which somehow have been strangely overlooked in the NHTSA studies and conclusions.

However, before I begin my specific comments on the above subjects, I would like to make the following statements. The issue now at hand is much larger and more fundamental than the simple old wornout question about Corvair rollover, and Corvair safety. It bespeaks the integrity of our Nation's justice simply because the report carefully and methodically destroys the credibility of all those Ford employees who in 1959 and 1960 developed the Ford data supplied to the Federal Government.

It also destroys my integrity but I am probably unique because I was warned and prepared for this immediately after writing my letter to Senator Magnuson in which I stated, "in summary, the 1960 Falcon was superior in limit of control compared to the Corvair and General Motor's implications that the Falcon, a competitor of the same era, was no better than the Corvair, is a flagrant violation of fact."

As it now stands I am the only auto industry employee and so-called expert who has dared to come forward and present the Federal Government with 70 opposing facts and analyses on the Corvair safety subject, and yet I know there are countless men who know, as I know, about this subject.

Everything that has transpired since writing my letter and discussion of recent NHTSA report only reinforces the prevailing bug

business employee attitude of "leave well enough alone, let sleeping dogs lie"—an old cliche.

When you work for a man, by God, you work for him, irrespective of the truth or the need for constructive criticism.

The point is that people are afraid but why are they afraid? Eric Fromm tells us in his book "Beyond the Chain of Illusions" who do people oppose the awareness of what they would otherwise be aware of? Undoubtedly the main reason is fear, but fear of what? There does not seem to be sufficient evidence to believe this.

Is it fear of being killed, imprisoned, fear of starvation? That might sound like a satisfactory answer provided repression occurred only in systems of terror and oppression. But since this is not so, we have to inquire further.

Are there more subtle fears in a society such as our own produces? Let us think of a young executive or engineer in a big corporation:

If he has thoughts which are not "sound" he might be inclined to repress them lest he might not get the kind of promotion others get. This in itself would be no tragedy were it not for the fact that he, his wife, and his friends will consider him a failure if he falls behind in the competitive race.

Thus the fear of being a failure can become a sufficient cause for repression.

Going on, but there is still another and as I believe the most powerful motive for repression, the fear of isolation and ostracism. For man, inasmuch as he is man, that is to say inasmuch as he transcends nature and is aware of himself and death, can sense the complete aloneness and separateness that is close to insanity.

Man as man is afraid of insanity just as man as animal is afraid of death.

Man has to be related. He has to find union with others so he can be sane. This need to be one with others is his strongest part, stronger than sex and often even stronger than his wish to live. It is this fear that makes people repress the awareness of that which is taboo, since such awareness would mean being different, separate, and hence, to be ostracized.

There is almost nothing a man will not believe or repress when he is threatened with the explicit or implicit fear of ostracism.

In my particular instance one can certainly ask as I have been asked, "Why did you wait until June 1971 to provide the information on the Corvair"?

Very simply, I was on an assignment in Europe for the 5 years of 1963 to 1968 and was unaware of the GM statements on our product, the Falcon, and its controllability comparison with the 1960 Corvair. These statements were made in 1966. I was made aware of the statement exactly 6 days before mailing my letter to Senator Magnuson.

Furthermore, I was not aware of the NHTSA studies on the Corvair and the temporary protection afforded me under the law.

As an example of why knowledgeable people do not come forth, I would like to cite some of my own experiences since sending my letter of June 3, to Senator Magnuson.

No. 1, I have been castigated by Mr. David Smith in his editorial in the Detroit publication, Awards Auto World. I would like to submit that today, the irresponsible lies in this editorial were corrected 3

months after my letter to him but very shortly after I retained an outstanding libel lawyer to prosecute my case.

No. 2, I have had two protective orders served on me by General Motors which limited very strictly the freedom to say what I know on the Corvair-Falcon subject.

These orders were obtained despite GM knowledge that I was exempted due to Federal law and also were obtained from the courts by the inclusion of false statements and circumstances.

No. 3, I have had a subpena duces tecum served on me to appear in their legal offices tomorrow morning, July 26.

> To bring with you and produce the following documents in your custody and control: Your complete file in connection with this case including, without limiting—or other tangible materials of any sort either supplied to you by plaintiffs or their attorneys or investigators or others acting on their behalf, considered or examined with you by plaintiffs or an expert in this case, or prepared by you or at your direction in connection with such employment.
>
> Further, your complete file with reference to design, manufacture or assembly of the Chevralet Convair automobile including without limiting the generality—whether in your possession or under your control relating to any tests or experiments which you have performed or to which you have been party and which involve the Chevrolet Corvair automobile.

Incidentally, I know nothing about the plaintiff's case and GM has stated in response to my plea for expert fee remuneration that they do not consider me an expert and only want to discuss the facts concerning the Ford film showing Falcon and Corvair handling.

No. 4, I have had counsel retained by General Motors bargain with me in the living room of my home in the presence of my wife over the importance of Ford and GM working together on product liability lawsuits. This was immediately preceeding my giving a deposition under subpena on the Corvair handling.

No. 5, I have been the subject of constant scrutiny by at least one car with a false license number plate and innumerable character assassinating phone calls including two calls to a business associate of my wife's degrading her character.

No. 6, I have been warned that all conversation on telephones at my home and my office are monitored.

No. 7, I have received an unusually high number of occurrences after the fact designed to frighten my wife all during my absence from my home.

No. 8, I have been told by my management:

> Harley, no one disagrees with your letter or facts; but right now, Friday, June 4, 1971, we are wearing a white hat and they—GM—are wearing a black hat, but we are both—GM and Ford—going to end up wearing black hats.

However, my management apparently may have understated the ending. With the NHTSA report, GM was wearing the white hat and Ford is wearing the black hat.

No. 9, I have not been informed of additional documents on the Falcon-Corvair subject submitted by my company to the Federal Government after my original file of June 4, 1971, even though I have sent them copies of all pertinent correspondence.

No. 10, I have had all important company sources of additional information on the Falcon-Corvair controversy blocked or cut off. For example, my request for an opinion from one of our outstanding suspension engineers whom I have known for 15 years and who was one

of my former employees was answered by the statement, "Harley, I am sorry, but if that's what you want, you'll have to clear it with legal first."

Whereupon, of course, I gave up.

Further, prior to writing my letter of June 3, 1971, I asked for a complete survey of our microfilm files on Corvair accident reports. This search takes several weeks but after sending my letter, the request for search was ignored. The whole subject was taboo and I was personna non grata. Don't look for trouble and trouble won't look for you.

No. 11, I have had to retain legal counsel and pay all expenses as well as devoting approximately 1,000 hours to defending myself in developing and presenting additional information which has been maligned or ignored in the NHTSA report of July, 1972.

No. 12, I have been asked twice by counsel retained by GM, "Do you work for Ralph Nader?"

No. 13, finally I found it necessary to retain a registered criminologist after some 8 months of most unusual circumstances surrounding my wife, myself and my personal life which commenced after sending my letter of June 3, to Senator Magnuson.

I must say that I have been privileged by the support and assistance afforded me by the Senate Commerce Committee and its staff and I thank you.

I have also had the loyal support for the rank-and-file employees of our company as well as my family and my real friends.

One does not work in any business for 26 years in all varieties of assignments without developing some deep loyalties which reach throughout all elements of the corporate structure.

When one becomes aware of the typical problems I have encountered during the 13 preceding itemized sample, and I must say the sample in no way includes all of my experiences; the individual asks, "Why would anyone want to come forward with anything which might assist Federal studies and investigations?" And yet I firmly believe that in his heart the average employee of a large corporation believes,

> The entire secret process substitutes rule by men for rule by law. Such a process always creates the danger that a case will be determined by political and personal influence or financial and economic influence rather than by the merits as judged by impartial jurists,

As stated by The New York Times in an editorial of March 19, 1972.

Finally, as an additional consideration that this simple issue has escalated to one affecting the future of our Nation's justice, I would like to quote from the two concluding pages of Thomas Whiteside's recent book, "The Investigation of Ralph Nader."

The first quote is by Mr. Fred Hooven on page 212. Mr. Hooven, an outstanding engineer-humanitarian is now retired but served as an advanced executive engineer under me in charge of early engineer studies on the Falcon and later as consultant to the Ford Division who produced the Falcon.

> I know why the decision was made at Ford to keep quiet about the Corvair. Everybody knew the truth would get lost. And Ford's credibility would be challenged and that would institute an era of dirty advertising and dirty PR, and Ford said, in effect, "We are in no shape to tell the truth about this".

And he added,

> Keeping secrets, this is an endemic disease. It is positively pathological.

And then Mr. Whiteside's concluding statement on page 213:

> And I have thought that what we are dealing with is indeed a disease, a serious industrial disease and one that is surely in need of a broad program of treatment.

The facts are, the Falcon was so superior to the Corvair that we could sell all we could make, while GM embarked on a crash program to practically duplicate the Falcon with their 1962 Chevy II.

Specifically relating to sales and our competitive spirit at that time. First, Falcon sales were nearly 75 percent higher than Corvair during the first 2 years of production. 905,000 versus 519,000.

Second, at introduction, Falcon underpriced Corvair by about $80, when the price difference of over $100 was corrected, with Ford's two door, compared to Corvair's four door.

Third, the Corvair had a cost profit problem. Corvair's actual design costs, as we estimated them were approximately $100 over Falcon design costs. With dealer profits, corporate profits as a ratio of sales and taxes, the Corvair cost/profit could not have been as good as the Falcon's.

Their added design costs would normally translate to $150 to $250 increase in retail price.

Fourth, Mr. R. S. McNamara, then group vice president of Ford's car truck divisions proudly told a group of us shortly after introduction of the 1960 Falcon that Mr. Edward N. Cole had told him, Mr. McNamara, that he would learn someday that Ford does not set price leadership.

By that, I assume he meant the Corvair, which was introduced ahead of the Falcon and at a higher price, gave us pricing leeway, and that we would learn to take advantage of this in our future pricing to achieve higher profits. We accepted Mr. Cole's admonition as a compliment and I am sure that Mr. McNamara's conveyance of the message was meant as a compliment to all of us who had worked to achieve the Falcon.

Now, assuming that the above facts are correct and that the Corvair had a cost/profit problem, is it reasonable to conclude that, first, their design of rear suspension was to save costs despite the existence of technology which would have provided the superior rear suspension but at approximately 20-percent cost penalty?

I made this point in my letter of June 3, to Senator Magnuson and I will submit exhibit II which shows the long-arm, double universal joint, higher cost suspension which I employed in the Ford design of the Jeep replacement vehicle under ordnance contract DA–20–018–ORD–11283, dated February 14, 1952. That was later changed to swing axle design after introduction of the Corvair.

The initial design was a success and we had all the requirements.

It is significant that this suspension used in early production of the Jeep replacement vehicle was first used on the GM light Chevrolet in 1946 and was conveyed to me by the late Earle S. McPherson, a former Chevrolet executive who joined Ford in 1948 and later became vice president of engineers for Ford.

Is it reasonable to conclude that a front stabilizer bar for the Corvair which would have improved controlability, was omitted to save costs? Is it reasonable to conclude that an engine manifold heater, with its potential for dangerous carbon monoxide leakage was specified to

save costs? As you know, the auto industry had discontinued use of these heaters in post-World War II designs.

We had developed a safer but more costly heater.

What is a controlability safety defect? A motor car company called "A" says, I am building cars which are 99.5 percent safe from the standpoint of controlability; 99.5 percent. This sounds very impressive, but then Mr. A does not define the missing one-half of 1 percent which prevents a 100-percent claim, because he might not know what is missing to prevent a perfect score.

Similarly, the panel indicates a serious quandary over the issue of the Corvair transition from understeer to oversteer. It has not been quantified in the DOT report, however, the panel correctly concludes that it is a serious problem and recommends that owners of, and drivers of 1960 to 1963 Corvairs be cautioned of this characteristic.

Now, along comes Motor Car Co. B, who says, I have got a car that I am building which is 99.9 percent safe from the standpoint of controlability. Only a four-tenths improvement. I do not think Mr. B would sell many more cars against Mr. A, who already has 99.5 percent, because after all, what is four-tenths percent anyway? Time passes.

Mr. A and Mr. B each build and sell 1 million motor cars. A couple of years later, they look at an accident statistic form, and here is what they see: Mr. A has had 5,000 accidents; Mr. B has had only 1,000 accidents. Mr. B better than Mr. A? He has had 4,000 fewer accidents.

Does Mr. A have a problem? I think so. It is just this finite difference that could force all motor car manufacturers to conduct extensive comparative testing under all types of real world conditions to insure that these subtle differences are corrected and to insure that a Mr. A-type motorcar is not produced.

Now, Mr. A's problem arose because he did not follow the fundamental rule of comparative handling development under real world conditions. If he did follow this rule and knowingly failed to correct his controllability problems because of cost or some other priorities such as time or preconceived motions, then he has irresponsibly produced a car which we would call unsafe with a safety defect.

We, at Ford, consider the 1960 Corvair to be a Mr. A type of motor car and important documents have been submitted to Senator Ribicoff's staff which confirm this statement.

The 1960 Corvair had a problem of controllability under certain emergency maneuvers on real world roads primarily because of transitional under-over steer. Loss of control does not necessarily mean the car will roll over. However, the 1960–63 swing-axle suspension Corvair, if the tucked-under wheel hits a solid bump, a curve, a chuckhole, then rollover is a probable end result depending upon the lateral skid rate.

The use of rollovers alone as the measure of vehicle safety is totally inadequate and, in my opinion, restricts the analysis and definition of vehicle handling stability. Very simply, loss of control must precede rollover.

My conclusions on the NHTSA report are, first, the test methods employed by NHTSA are in no way representative of those used by the automotive industry for developing and measuring handling stability, and controllability of our production products. Second, the test methods employed are structured to arrive at numerical qualifications,

a numbers game. This technique is most unusually coincidental with techniques used by General Motors in Corvair product liability litigation.

Specifically, the technique of testing on ultrasmooth roads, level within 1 percent, and having high adhesion factors, is not valid overall. This is only valid for some aspects of research and development.

I would like to read to you something I submitted to Senator Ribicoff's staff in October 1971.

NHTSA says—they completed their last test on July 15, 1971. They had the Ford movies in early June, a month before these tests were run. I comment on the fact that only expert drivers can handle more than three-tenths lateral *g*.

Now GM made this statement in the March 22, 1966, hearings which I previously mentioned and this general statement is made on page 1561 of this document. GM fails to mention that the conditions for which they speak are under smooth, ideal conditions wherein g. forces felt by the drive are very nearly the same g. forces of the tires at the road surface. In fact, under real world conditions the g. forces felt by the driver are much less than g. forces at the tire/road on typical undulating blacktop or concrete public roads. Real world tire-to-road lateral g. forces cause incipient skid or slip which the average driver does not discern. Indeed, we as an industry attempt to disguise these forces so that the customer may experience the pleasure of a plush ride.

Now this was especially the case with the Corvair and was proclaimed as a virtue. The high g. forces causing incipient skid were so well disguised that they stated as a result of their laboratory tests with "real wheels in tramp motion at wheel hop frequency" these are lateral forces as on a rough road, 12 to 15 cycles per second.

A 1957 Chevrolet, the last model Chevrolet produced with solid axle suspension, had 2.9 times more lateral axle motion, 1.4 times more lateral body/frame motion, and 6 times more lateral front seat frame motion compared to a Corvair with equal vertical wheel motions. Other presently produced vehicles with solid axles had simply large lateral motion excited by this type of suspension.

Now the point I am making here is that GM, the Corvair disguised these instantaneous high g. forces the wheels were making on undulating roads. The three-tenths lateral, four-tenths later g. that they keep talking about and have talked about in product liability litigation, talked about it March 22, 1966, talked about in this report is only theoretical. Because when you run it on smooth roads which are not typical, then you are merely representing on the g. meter that which is happening between the tire and road. But when you go on a rough road, you could well be reading two-tenths or three-tenths on your g. meter and your tires and wheels would be exceeding six-tenths because of their motion.

These—this characteristic was very well disguised in the Corvair primarily because they had a package powerplant in independent rear suspension. Therefore, I say a highly idealized g. force suspension system has no real advantage if these values cannot be translated into competitive handling on public roads as stated in the last paragraph of GM's statement under oath to Senator Ribicoff's subcommittee on March 27, 1966. This is what they said—Mr. Winchell's statement:

A car having a high capability in lateral acceleration may be completely inadequate in the transitional phase of entering or leaving a curve or in an s maneuver or in passing, or in turning while braking or accelerating, or in low coefficient pavements.

That was submitted to Senator Ribicoff's staff in October of last year. I assume it was forwarded to DOT and NHTSA.

No. 3, in my conclusions under the conditions of test, ultralevel and high adhesion surfaces, it is possible to generate nonreal world lateral g. forces which have no relevance to our public roads, which, as we all know, are undulating black top or concrete. On these real world undulating roads, the total veihcle lateral g. forces are much lower than the transient and instantaneous lateral g. loads which are constantly developed between the tires and the road. Therefore with most suspension systems running on undulating black top, the total vehicle g. loads are often very low while instantaneous g. forces between the tires and road are near the critical point due to the suspension systems absorption of the bumps and road makeup.

No. 4. The test methods of "steady turn" are nonreal world simply because most vehicle maneuvers are a complicated system of transient dynamics or in other words a system of ever changing conditions.

No. 5. The failure to seek expert automotive advice which would have resulted in constructive suggestions—in structuring the tests, along with the failure to use proven industry techniques invalidates all conclusions drawn from the tests.

No. 6. Only 1960 models to exact 1960 specifications should have been used because the 1963 Corvair had been improved over the 1960 model.

General Motors' statements have been all-inclusive for model years 1960–63 wherein they claim controllability being equal to or better than competitive cars of the same era. Stated another way, the worst of the model years should have been used because their statement includes the 1960 model.

No. 7. The vehicle should have been evaluated at only two-passenger load as the primary basis of comparison because this represents the approximate 90-percent car population operating condition. Minor examinations then should have been made at four-passenger load and finally at full load. It should be noted that the full load condition used in all tests favor the Corvair because of its front luggage compartment and their lower passenger seating position. One must ask, "Why was a 1-percent load operating condition used and all other real world load conditions ignored?"

No. 8. One concludes from the report that the more costly and more complicated rear suspension adopted for the 1965 Corvair was, in fact, a waste of money and investment by General Motors. The report shows that the lower cost in simple rear suspension of the 1960–63 model was more than competitive. Of course, this is a myth; and I only say this to indicate the inadequacy of the test methods.

Now, the panel's conclusions are invalid because they were not provided with real world facts as previously stated. They were led to believe that three-tenths g. was the appropriate practical limit for the average motorist and that wheel and tire adhesions, g. forces, are the same as the three-tenths g. forces felt with the driver.

If they had been provided facts for the greater percentage of operating conditions on undulating blacktop or concrete they would have known that three-tenths g. felt by the driver can mean instantaneous suspension system g. forces well past the critical range over which they have expressed concern in the addendum.

It is this characteristic operating condition that causes loss of control and real world testing with exposed deficiencies.

Next I would like to talk about the credibility of the Ford film shown showing the comparative handling characteristics of the 1960 Falcon and Corvair.

While preparing my letter to Senator Magnuson dated June 3, 1971, I discovered the only extant copy of a film on the Ford Motor Co. proving ground made in August–September 1959, indicating the serious handling deficiencies of the 1960 Corvair.

This film was made at the request of Mr. J. O. Wright, then vice president and manager of the Ford division, and was subsequently shown to the evaluation committee on September 23, 1959, and on October 1, 1959, to the executive committee which at that time was the corporate operating committee. Because the transitional and/or emergency handling characteristics of the Corvairs run in our testing indicated an almost unbelievable flaw in the car's controllability, we prepared the comparative handling film to demonstrate to corporate management the Corvair's handling characteristics at their request.

The film was made after at least two inadvertent rollovers of the Corvairs in late summer 1959 as itemized in my June 3 letter to Senator Magnuson.

Furthermore, there had occurred innumerable instances of loss of control on our Deerborn proving ground.

These films emphasized relative handling characteristics under conditions of transitional under-over steer and were run on typical real world undulating blacktop surfaces.

Following my letter to Senator Magnuson of June 3, additional documents were discovered from which I will quote important statements relating to the film Corvair handling evaluations as presented to the executive committee, October 1, 1959.

First before showing the film the executive committee document said:

> It is necessary to emphasize at this point that these are completely objective tests and in no sense have they been contrived to show the Corvair in an unfavorable light.
>
> The drivers of both cars are equally skilled drivers from our test track area and the Corvair driver was instructed to make every effort to keep his car under control.

Then after showing the film:

> The lack of extreme cornering ability is not a significant product disadvantage in itself. Of much greater significance in the preceding film has been the difficulty experienced by the Corvair driver in reestablishing control over his vehicle once it had been lost. This is indicative of a lack of stability which is more likely to be encountered by the average driver under average conditions and this condition is deemed to be a significant product disadavntage.

Then in the discussion of riding handling as the result of engineering evaluations, not the film:

> The Corvair with its rear heavyweight distribution shows marked instability under conditions of severe cornering and in passing. While the driver will not encounter difficulty under most normal driving conditions, there are frequently encountered emergency conditions such as slippery pavement or emergency maneuvering which the driver cannot maintain control of the vehicle. The Corvair falls considerably short of our handling standards.

Although during my investigations, and, subsequently, we were unable to discover an additional film which showed the Volkswagen and

Renault Dauphine running against the Falcon, it is important to note during executive committee presentation we stated:

For reference purposes, we have also shown the Volkswagen and the Renault Dauphine under similar circumstances at comparable speeds. These pictures show that both of these vehicles have ability to corner at higher speeds with less instability than the Corvair, and these tests were run also on the same undulating blacktop roads.

After—at the request of Senator Ribicoff's staff, I analyzed the film and submitted my analysis to his staff on November 8, 1971 (exhibit IV). I must say that there are innumerable methods of analyzing comparative handling characteristics shown in the film. In the final analysis results must provide "go"-"no go" quantification of handling characteristics.

In this instance, a typical method has been used to assess the control adequacy of the Corvair relative to the Falcon as shown in the attachments. Namely, first, the severity of control deviation was defined in terms of four categories; stable, minor, major, and lost. Second, a control adequacy percentage within a range of plus or minus 10 percent was assigned to each of the above four severity ratings: stable, minor, major, lost. Third, all test runs in the film were analyzed.

Severity ratings were assigned and a sequence of control deviation was noted in terms of oncoming lane and/or adjacent shoulder.

Fourth, the percent control adequacy within a range of plus or minus 10 percent was assigned for each test run based on the above.

Fifth, an average performance of 60-percent control adequacy was established as the minimum acceptance standard for the Corvair.

In summary—now, the Falcon made 100 percent during these tests and the acceptance standard for the Corvair was set at 80 percent.

In summary, a method has been evolved which provides quantification of control adequacy in terms of percentage relative to the Falcon for the conditions of dry, blacktop, slightly undulating surfaces.

It should be emphasized that fully definitive comparisons will require similar tests under many more adverse conditions such as wet blacktop, curves of changing road camber, surprise bumps, ice, snow, et certera, et cetera.

The conclusion background lying in the film were basically based on a 60-percent acceptance standard. The Corvair with standard tire pressure achieved 30 percent of the standard. Their rating was 18 percent against the standard of 69 percent.

Applying the maximum favorable variation of plus 10 percent, the Corvair achieved 48 percent of the minimum acceptance standard; in other words, 28/60 percent.

Now the conclusions-I would like to discuss concerning the film.

I believe the correlation is within plus or minus 10 percent, but considering the fact that the Corvair had to follow the Falcon, a minimum acceptance standard of 60 percent was established for the Corvair. Therefore, compared to the Falcon which was the lead car in the comparative tests, a very generous allowance of 50 percent was used in my analysis.

One hundred minus sixty is forty percent. The plus tolerance in assessing the numerical calculations is 10 percent, the sum of 40 and 10 is 50 percent.

Therefore as indicated above and as stated in my analysis of the film, the Corvair at standard tire pressure achieved 28/60 of the ac-

cepted standard and the plus columns as applied to the 18 percent of phase 1 and phase 2 tests.

Another way of stating the conclusion is to say the 1960 Corvair standard tire pressure achieves slightly less than one-half of the handling standard.

As I defined it, a minor swerve with full recovery using less than the oncoming lane rated 50-percent control adequacy. It is significant that had all of the swerves been into the oncoming lane with full recovery, the Corvair would have met the minimum handling standard of 60 percent when applying the plus 10-percent tolerance.

Now as a matter of comparison it should be noted that a swerve with full recovery, onto the shoulder rather than on the oncoming lane was only penalized 25 percent from the 100-percent base, and therefore assigned a 75-percent value for control adequacy.

If, for example, all of the swerves had been onto the shoulder with full recovery the Corvair would have exceeded the minimum handling standard by 25 percent without application of the 10-percent tolerance.

It is common knowledge the car/driver systems frequently experience minor swerves. The ability of a car/driver system to recover under these minor adverse conditions is essential for a safe handling motor car.

Mr. Fred Hooven—I mentioned Mr. Fred Hooven before—on June 17, 1960, he summarizes for Ford Corporate management our conclusions at that time concerning recovery and wheel adhersion of the 1960 Corvair. I have a copy of that letter here as an exhibit.

> One of the outstanding characteristics to emerge from our competitive tests of the Corvair and Falcon was the fact that not only did the Corvair have a low level of load limit per maximum permissible speed in the terminal, but once this limit had been exceeded, the vehicle became totally uncontrollable. The penalty for misjudgment of speed in a turn or of insufficient attention on the part of the driver is therefore not only more often encountered in the Corvair but is much more severe.

His other report, which I am in less of a position to verify, also supports the conclusion,

> That such vehicle instability is in truth a serious accident risk and safety factor. While such factors have less direct effect on vehicle sales than more easily discernible product characteristics, they certainly constitute a highly undesirable condition which we at Ford should make every effort to avoid.

Mr. Hooven wrote that letter to advanced product management, including Mr. McNamara. At that time he was consultant to the Ford Division management.

In discussions the NHTSA conclusions "The film by Mr. Copp is not a valid—" the material previously stated concerning my analysis of the Ford film right through to the Ford conclusions was extracted almost verbatim from my analysis submitted to Senator Ribicoff's staff on November 8, 1971.

The discussions, the conclusions immediately following the November 8 material, was submitted to its staff at their request on June 29, and therefore could not have been included. We all must ask why didn't NHTSA come to the Ford Dearborn proving ground and repeat the same tests on all of the test cars over and over again.

To me it is interesting in analyzing the report that the General Motors films have apparently been accepted de facto, but the one and only film by an adversary is completely written off even though its

origin had been validated. The Ford film story hangs together from beginning to end and even confirms the flaw discerned by the panel. It fully confirms in every way the 1960 Corvair's problems of transitional handling in stability on typical roads.

As earlier stated, NHTSA accused the test drivers of rigging the results to make the Corvair look bad.

Regardless of the two driver's sworn statements, I must tell you that such dishonesty within our company could never have produced a great car like the 1960 Falcon. We didn't have to rig anything to demonstrate this flaw, and we didn't have to tell management lies about our new Falcon, because we knew we had a winner.

Did the Corvair have a flaw? The panel thinks it did. We thought it did and I think history proves us correct.

Finally, I recommend that two 1960 Corvairs and two 1960 Falcons be built to exact 1960 specifications and first be evaluated on the Ford and General Motors handling grounds by a cross section of drivers; and second that they be evaluated in tests called the "wave"—simulating a passing maneuver or more practically stated, an emergency avoidance maneuver, all under varying climactic conditions. Drivers should switch back and forth between the two Corvairs and two Falcons. The tests speeds should be established to define limit of control for all four cars under all conditions.

Drivers should be asked to rate the cars after driving them for each test sequence of load and climatic conditions. In addition, films should be made of all tests, and an impartial jury of car handling experts should judge the results.

The NHSTA claim that they couldn't obtain 1960 cars is controverted by the hundreds of fully restored antique cars in this country which are 30 to 70 years old. Care must be taken to insure that exact 1970 specifications are applied in all tire suspension and steering components. It is well known design improvements are made on service parts and these are interchangeable with the original design. Accurate comparison requires exact 1960 specifications.

It should be noted the 1960 Corvair can be made more favorable in handling controllability by minor changes, indiscernible by layman.

It is equally important that roll rates and roll rate distribution be exactly as those measured on the 1960 vehicles.

Also the type of shock absorbers including cut-off characteristics should be clearly defined as those in production on the 1960 vehicle.

These tests which I recommend are standard for our industry and clearly define controllability. They do not depend upon experimental ivory tower research techniques.

They provide honest, real world conclusions. Until the recommended tests are conducted, the results evaluated, NHTSA will never know the truth of this confounding dilemma.

Finally, I ask that evidence submitted by me and by the Ford Motor Co. be truthfully evaluated and that NHTSA correct their report.

Thank you.

I apologize for the length of the discourse.

Senator HARTKE. Thank you, Mr. Copp.

There is one situation which does disturb me. We have testimony here today which in substance alleges that a witness who voluntarily came forward with vital information to our committee, has allegedly

85-820 O - 73 - 13

been harassed and intimidated because of his exercise of citizen participation.

Under section 1505 of the criminal code, United States Code Annotated, there is a procedure which deals with the obstruction of proceedings before departments, agencies, and committees. It says that whoever by threats, force or threatening letter communication endeavors to influence, intimidate or impede any witness in any proceeding before any department or agency of the United States, or in connection with any inquiry or investigation being had by either House or committee of their House or joint committee of the Congress shall be fined not more than $5,000 and imprisoned not more than 5 years or both.

I am going to direct the staff at this time to consult with the Justice Department to see whether or not there has been any violation of that section of the criminal code.

Mr. COPP. Thank you.

Senator HARTKE. If a witness cannot freely come before their own Government without fear of intimidation or influence, they certainly should know about it. Also, I am going to ask the staff to take up these matters with Mr. Toms, the director of the National Highway Traffic Safety Administration, and see what procedures were followed on that regard.

The staff will also direct a letter to the president of each one of the three major networks, NBC, CBS, and ABC for their explanations for refusal to permit the Allstate Insurance Co. to demonstrate the results of their air bag tests. I am directing the staff to do the same with the FCC at which time an analysis will be made for further determination as to whether or not any further witnesses will be asked to testify.

All right. These hearings are recessed.

(Whereupon, at 4:10 p.m., the committee was adjourned.)

ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS

(The following information was referred to on p. 40:)

PANEL EVALUATION OF THE NHTSA APPROACH TO THE 1960-1963 CORVAIR HANDLING AND STABILITY

Submitted by

GENERAL TESTING LABORATORIES, INC

CONTRACT NO. NHTSA-2-2306

JANUARY 25, 1972

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

WASHINGTON, D.C. 20590

PANEL EVALUATION OF
NHTSA APPROACH TO THE
1960-1963 CORVAIR HANDLING AND STABILITY

SUBMITTED BY

GENERAL TESTING LABORATORIES, INC.

CONTRACT NO. NHTSA-2-2306

JANUARY 25, 1972

PREPARED BY: Harley E. Holt
Harley E. Holt
General Testing Laboratories

APPROVED BY: Edwin L. Resler Jr.
Edwin L. Resler, Jr.
Date: February 9, 1972

Paul H. Wright
Paul H. Wright
Date: February 7, 1972

Ray W. Caldwell
Ray W. Caldwell
Date: 2/8/72

The opinions, recommendations and conclusions expressed herein are solely those of the panel members and are not intended to reflect the opinions of the writer or General Testing Laboratories in any way.

DATE January 25, 1972

TABLE OF CONTENTS

		Page
I.	Introduction	2
II.	Summary	3
III.	Comments on Assertions by Ralph Nader, et al	5
IV.	Comments on General Motors Data	7
V.	Comments on the D.O.T. Corvair Evaluation	7
VI.	Recommendations by the Panel	7
VII.	References	
	Letters	9
	D.O.T. Reports	10
	GM Reports	11
	SAE Papers and Presentations	12
	General References	13
	Films	14
VIII.	Biographical Sketches of Panel Members	16
IX.	Addendum	19

DATE January 25, 1972

1. INTRODUCTION

On 15 September 1971 Mr. Edwin L. Resler, Jr. from Cornell University; Mr. Paul H. Wright from Georgia Institute of Technology, and Mr. Ray W. Caldwell of the Autodynamics Corporation were engaged by the National Highway Traffic Safety Administration of the Department of Transportation to participate as members of a three-man advisory panel to evaluate the NHTSA study of the 1960-1963 Corvair handling and stability characteristics. General Testing Laboratories was requested to report the findings of the panel and to assist in the coordination of the meetings and activities of the panel with the NHTSA.

The tasks of the panel included the following:

1. Review all correspondence between Ralph Nader and his associates and officials of the D.O.T.

2. Review and examine the General Motors Corporation documents and films supplied to the D.O.T.

3. Review an NHTSA Analysis of Corvair handling and stability.

4. Review and examine the NHTSA films and a report of tests conducted at Texas A&M University.

5. Review related literature on vehicle handling and stability.

6. Arrive at joint panel findings, conclusions and recommendations about past and future NHTSA programs for evaluation of the 1960-1963 Corvair handling and stability.

The initial meeting of the panel was held at D.O.T. on September 15, 1971 with the following persons present:

J. H. Clark, Jr. - D.O.T.
M. J. Lilley - D.O.T.
E. Wittich - D.O.T.
E. French - D.O.T.
P. H. Wright - Georgia Institute of Technology
E. L. Resler, Jr. - Cornell University
R. W. Caldwell - Autodynamics Corporation
H. E. Holt - General Testing Laboratories - Recorder

DATE January 25, 1972

The panel members were informed in the opening remarks by Joe Clark that they were not being asked to endorse the Corvair, the position of the General Motors Corporation, the charges by Ralph Nader, or the Department of Transportation. Rather, they were requested to evaluate all of the information presented to them and give their candid opinions and views on the approach taken by the D.O.T. Two additional panel meetings were subsequently held, one at General Testing Laboratories on 27 September 1971, and at D.O.T. on 15 December 1971.

On 12 April 1972 the panel was reconvened at D.O.T. at the request of NHTSA to evaluate additional information concerning the Corvair understeer-oversteer transition and its possible consequences in the 1960-1963 Corvair. On 2 and 3 June 1972 another panel meeting was called to review and finalize the report. This report includes an addendum at the end in which the transition is defined and its implications to the Corvair are discussed.

II. SUMMARY

In the mid-1960's Ralph Nader charged that the 1960-through-1963 Chevrolet Corvairs handled in an unstable manner and had a propensity for over-turning. He further asserted that this condition was caused by a design defect which constituted a safety hazard and that it should be corrected by General Motors Corporation. He has maintained this position to the present time.

The panel, in evaluating the information presented to it, considered whether these charges were valid by comparison of the characteristics of vehicles available to the public during the period from 1960 to 1963. From this perspective, it is the opinion of the panel that the Corvair quantitatively meets or exceeds the standards set by contemporary cars in stability tests, cornering tests and roll-over tests. For this reason, the panel concluded that the 1960-1963 Corvair does not have a safety defect and is not more unstable or more likely to roll over than contemporary automobiles.

Information furnished to D.O.T. by General Motors including movies, written reports and a summary of the handling characteristics of the 1960-through-1963 Corvair is accurate in the opinion of the panel. However, while General Motors describes the change from an initial understeer condition to final oversteer in the controllable range of the vehicle as being a gentle transition, its effects could cause some drivers to lose control of their vehicles under certain circumstances. This transition does appear gentle when depicted graphically with the "stability margin"* plotted versus lateral acceleration. This curve is, however, independent of time and therefore the transition from understeer to oversteer through the neutral steer

*The "stability margin" is defined as the distance between the vehicle center of gravity and the instantaneous neutral steer center, measured in percent of wheelbase.

DATE January 25, 1972

condition, which occurs at approximately 0.4 g lateral acceleration, does not infer in any way, the time available to the driver to adjust to the change in steering characteristics. The film data indicates, however, that the Corvair can change from understeer to oversteer in a very short period of time when the car is involved in a turning situation under emergency conditions. This characteristic is the only significant feature of the Corvair which could account for the Corvair handling stability controversy.

The D.O.T. evaluated the same information that was presented to the panel. Although they summarily concluded that the 1960-through-1963 Corvair did compare favorably with other contemporary cars from the points of view of handling stability, cornering forces and forces necessary to roll it over, they then conducted a series of their own tests which served to corroborate the above review of information and test data. D.O.T. therefore concluded that the 1960-through-1963 Corvair did not have a safety defect. Although the importance of the rapid transition from understeer to oversteer in the controllable range was recognized, it was not emphasized and it could not be investigated in terms of driver response since the tests conducted by D.O.T. were of the input-response type.

Also, although a thorough attempt was made by D.O.T. to collect Corvair accident data, an evaluation of the Corvair accident frequency was limited because of the small amount of actual accident information which exists.

The panel, after evaluating all of the above information, decided that: (1) the handling characteristics of the 1960-through-1963 Corvair had been appropriately and sufficiently defined; (2) not enough data is available in the area of actual frequency of accidents to allow a valid determination to be made as to whether the Corvair has been involved in more accidents than contemporary cars; and (3) the only real issue appeared to be whether or not the average driver can cope with a rapid change from understeer to oversteer during a period of stress.

Although the Corvair, with its rear weight bias and swing axle rear suspension is somewhat different from contemporary American automobiles, it is similar in both design and handling to some contemporary foreign cars. The lack of accident statistics makes it impossible to determine whether or not there is a real accident cause and effect relationship between the handling characteristics of the Corvair and the actual driving situation. Unfortunately, and this is true of all other vehicles as well, there are no test methods presently available which would allow a complete and quantitative evaluation to be made of Corvair driver interface with vehicle handling characteristics such as a rapid understeer-oversteer transition.

The panel therefore makes the following recommendations: (1) that a notice be issued by the D.O.T. stating that there is a handling characteristic peculiar to the Corvair which is the possible occurrence of a rapid transition from understeer to oversteer within the range of driver controllability. Owners and drivers of 1960-through-1963 Corvairs should be cautioned to familiarize themselves with this particular characteristic so that they will not be caught unaware, (2) that the recommended tire pressures should be strictly adhered to because changes in the recommended pressures can result in the understeer-oversteer transition to occur at even lower lateral accelerations, (3) that the D.O.T. should perform the research necessary to develop minimum handling requirements for all cars so any unusual handling characteristic will not occur in a manner that poses possible safety hazards to the driver. Until such time, vehicle manufacturers whose vehicles possess unusual handling characteristics, should inform owners of them and their consequences as accurately as possible.

The panel also feels that the tests to date have sufficiently described the characteristics of the Corvair handling and stability and further testing along these lines is unnecessary. The 1960-through-1963 Corvair is now a minimum of eight years old and retrofitting would in many cases be ineffective in view of the present condition of vehicles of that vintage. In light of the vast amount of information gathered and the sound manner in which D.O.T. has performed their research on the Corvair, the panel further recommends that D.O.T. should now direct their efforts toward other problems which have greater importance to present traffic safety.

III. COMMENTS ON ASSERTIONS BY RALPH NADER, et al

In the opinion of the panel, Ralph Nader, et al sensed there was a difference between the Corvair and contemporary American cars of the 1960-through-1963 period. He expressed his feelings in terms that the Corvair handled in an unstable manner and also had a propensity to overturn. This has been the basis for his assertions that the Corvair design constitutes a safety defect.

The tests and investigations by General Motors Corporation, by the D.O.T., and finally the evaluation of this information by the panel indicate that there is no evidence to support the contention that the Corvair will roll over more easily than contemporary vehicles. Films of tests designed to determine overturning susceptibility of the Corvair show that it is possible to turn the car over on a flat surface if energy is stored in the suspension and then released, as in a "modified J turn." But attempted roll-overs were very difficult to accomplish. In order to roll the Corvair over, a lateral force equal to .95 of its weight must be supplied at the center of gravity. This compares with a 1.0 g side force

usually necessary to accomplish roll-over for other cars and is in accord with accepted practice. Significantly, in the Texas A&M input response tests, there were no roll-overs (outrigger contacts) for the Corvair in any of the tests, but the 1962 Volkswagen showed a marked tendency to overturn in the reverse steer and drastic steer-drastic brake tests. The D.O.T. input response tests all verify the results of driver controlled tests conducted by General Motors.

The limit of control for the 1960-through-1963 Corvair is a lateral acceleration of about 0.6 g, a value equal to or greater than maximum lateral accelerations for other vehicles of comparable weight and size manufactured during that period. Also, when operated below the steering transition, the Corvair handles generally better than contemporary cars.

What is different about the 1960-through-1963 Corvair is the characteristic transition from understeer to oversteer which occurs at a lateral acceleration of 0.4 g to 0.5 g. Occurring as it does at lateral accelerations seldom experienced by the average driver, this transition presents the driver with a change in handling control characteristics which may be difficult to cope with when it occurs quickly. It has been determined that the vast majority of drivers will not knowingly and voluntarily operate their car so as to experience lateral accelerations above about 0.3 g, and this level is generally tolerated only at speeds less than twenty miles per hour. It would appear therefore that the average and prudent driver would encounter the rapid understeer-oversteer transition in the Corvair only in emergency situations in which the vehicle is already in imminent danger of going out of control. In this case, a driver facing the unexpected transition could make the wrong steering response and contribute to the occurrence of a crash or worsen its consequences. One can only decide whether or not the transition is a gradual one when the time frame within which a transition occurs is known. In the General Motors films it was observed that the lateral acceleration might go from 0.3 g to 0.6 g in a quarter to a half second depending n the attitude and speed of the vehicle. While the overall effects of thi phenomenon cannot be determined with certainty from the data presented, it appears to the panel that it could be detrimental to traffic safety. However, in the opinion of the panel, it is not a matter of faulty design but rather, it is a characteristic of car handling which should be discussed in broader terms, namely, whether or not future cars should be designed so as to have handling transitions which occur low in the controllable range.

The available data do not allow a complete evalution of the Corvair with various tire pressures, but routine estimates indicate that the control characteristics of the Corvair can be altered significantly if the recommended differential tire pressure is not maintained. Changes in tire

pressure differential can cause the oversteer characteristics to be changed with a possible consequence being that the transition from understeer to oversteer will be shifted to a lateral acceleration value of less than 0.4 g. However, this differential in inflation pressures is not unusual even in current automobiles such as some station wagons and other foreign automobiles.

IV. COMMENTS ON GENERAL MOTORS DATA

Although General Motors' initial steps relative to early charges made by Ralph Nader appeared to be somewhat abortive, they subsequently furnished to D.O.T. upon request a large amount of very candid information which made it possible to evaluate the actual characteristics of the 1960-through-1963 Corvair. The movies which depicted the Corvair entering various radius circles at various speeds, and the movies of the car on the test track plus the movies of contemporary cars under the same maneuvers allowed both D.O.T. and the panel to accurately get a quantitative depiction of the 1960-through-1963 Corvair. The General Motors summary of the characteristics of the Corvair seems complete and accurate. Although General Motors describes the understeer-oversteer transition as a gradual, gentle change, and the conclusions drawn are somewhat biased in their favor, the information appears to be factual and it was very helpful to both D.O.T. and the panel.

V. COMMENTS ON THE D.O.T. CORVAIR EVALUATION

The D.O.T. has made an honest and effective evaluation of the 1960-through-1963 Corvair. The report of 31 December 1970, which was not issued, is clear, concise, appropriately depicts the Corvair characteristics and, with one exception, should be sufficient to evaluate any charges concerning the Corvair design. That exception is again the discussion of the importance of the understeer-oversteer transition. Although the possibility of its rapid occurrence is discussed, it occurs at 0.4 g to 0.5 g lateral acceleration which is within the range of controllability and this is the reason for its significance.

The research performed for NHTSA relating to handling and stability of the Corvair was adequate in scope and depth, basically sound in design, and professional in its performance.

DATE January 25, 1972

VI. RECOMMENDATIONS BY THE PANEL

In determining the advisability of further research, it is important to view the 1960-through-1963 Corvair problem and the overall accident problem in perspective. A total of 1,124,076 were manufactured during his period, of which approximately one-third are estimated to still be in use. This constitutes less than one-half of one percent of the registered vehicles in the United States. With the current magnitude and severity of other aspects of the traffic safety problem, no further testing relating specifically to the handling characteristics of the 1960-through-1963 Corvair is recommended.

The panel recommends that owners of 1960-through-1963 Corvairs be advised that these vehicles may exhibit unusual handling characteristics under conditions of hard cornering. They should be instructed that these handling characteristics do not arise when the vehicle is operated normally and prudently, but may be encountered in emergency situations such as exceeding posted safe speed limits for highway curves and expressway exit ramps. Owners should be further cautioned that these handling characteristics may be affected by failure to maintain the proper tire pressures as specified by the vehicle owner's manual.

Further research to provide a better understanding of vehicle handling characteristics and their interaction with the driver is strongly recommended. Efforts by D.O.T. to develop a set of test procedures to determine minimum acceptable safety vehicle handling performance levels should be continued. Contemporary design concepts, provided they exceed the minimum acceptable limits of safety, should not be criticized or suppressed only for being "different" from normal accepted current practice because any attempt to do so will result in the freezing of design requirements and will stifle creativity. Rather, manufacturers should be encouraged to be innovative in their approach to the solutions of current requirements so that the state-of-the-art will continue to be improved.

It is also recommended that a nationwide data collection network be developed to provide up-to-date statistically valid data relating to make, model and year of manufacture of vehicles involved in crashes. Such a system would provide early discovery of vehicle-related safety deficiencies and would point the way for in-depth vehicular safety studies, such as this one, to ascertain the need for vehicle recall campaigns.

DATE January 25, 1972

LETTERS

1. September 4, 1970 - Letter to Secretary Volpe, DOT, from Ralph Nader

2. September 11, 1970- DOT News Release including:
   September 9, 1970 - Letter to Thomas A. Murphy, General Motors, from Rudolpho Diaz, DOT
   Undated - Letter to Ralph Nader from Secretary Volpe, DOT

3. November 1, 1970 - Letter to Rudolpho Diaz, DOT, from Gary Sellers, Public Interest Research Group

4. December 3, 1970 - Letter to Gary Sellers, Public Interest Research Group, from Rudolpho Diaz, DOT

5. December 15, 1970 - Letter to Secretary Volpe, DOT, from Ralph Nader

6. February 23, 1971 - Letter to Secretary Volpe, DOT, from Ralph Nader

7. March 17, 1971 - Letter to Rudolpho Diaz, DOT, from Gary Sellers, Public Interest Research Group

8. March 25, 1971 - Letter to Gary Sellers, Public Interest Research Group, from Ralph Nader

9. July 8, 1971 - Letter to Senator Ribicoff from Ralph Nader

DATE January 25, 1972

DOT REPORTS

1. September, 1967 - "A Program Plan for Developing Safe Handling Standards for Motor Vehicles" (CAL Report No. VJ-2494-V-1) by Fred Dell'Amico, Cornell Aeronautical Lab., Inc.

2. April, 1970 - "State-of-the-Art Definition of Vehicle Handling," Vol. I (DOT Report No. FH-11-7315-DARD-1) by Digitek Corporation

3. November, 1970 - "Parametric Study of Vehicle Dynamic Response," Vol. I (DOT Report No. FH-11-7315-DARD-2) by Digitek Corporation

4. November, 1970 - "Parametric Study of Vehicle Dynamic Response," Vol. II (DOT Report No. FH-11-7315-DARD-2) by Digitek Corporation

5. November, 1970 - "Vehicle Handling Test Procedures," Vol. I, (DOT Report No. PB 196 953) by H. Dugoff, et al, University of Michigan

6. November, 1970 - "Vehicle Handling Test Procedures," Vol. II, (DOT Report No. PB 196 954) by H. Dugoff, et al, University of Michigan

7. December 31, 1970- "Analysis of the 1960-1963 Corvair Handling and Stability" by the Motor Vehicle Programs, NHSB

8. September 10, 1971-"Input Response Tests of Selected Small Passenger Cars" by Texas A&M Research Foundation in cooperation with NHTSA

DATE January 25, 1972

GM REPORTS

1. April, 1961 - "Corvair Steering" by Maurice Olley, GM Corporation

2. November 4, 1963 - "Corvair Dynamic Stability Tests for Chevrolet Motor Division" (Report No. PG-17103) by C. C. Culver, GM Engineering Staff, Proving Ground Section

3. June 14, 1963 - "Rollover Stability Evaluation of Various Corvair Suspension Systems" (Report No. PG-15699) by B. Heurtebise, GM Experimental Engineering Department

4. April, 1971 - Revisions to "Vehicle Handling Test Procedures" dated 4/8, 4/15, 4/26, and 5/14/71 by GM Handling and Stability Division

5. May, 1971 - "Proposed Vehicle Testing Procedure" by General Motors Corporation

6. Undated - GM Summary of General Information on the Specifications & Characteristics of the 1960 to 1963 Model Corvairs

7. February 12, 1971- "Comments on the Nader Letter of December 15, 1970 and Engineering Statements Attached Thereto"

8. February 21, 1971- Transcript of Senate Highway Committee hearings conducted by State of Michigan.

9. August 30, 1956 - "Research in Automotive Stability and Control and in Tyre Performance" published by The Institution of Mechanical Engineers, London

DATE January 25, 1972

SAE PAPERS AND PRESENTATIONS

1. January, 1960 - SAE Preprint of "The Chevrolet Corvair" by GMC presented at the SAE Annual Meeting, Detroit, Michigan

2. March, 1960 - SAE Preprint of "Suspensions from the Ground Up" by C. M. Rubly, GMC, presented at SAE National Automobile Week Meeting, Detroit, Michigan

3. December, 1965 - "Vehicle Dynamics Terminology," SAE 670a and revision b dated May, 1970

REPORT NO. A-3971

PAGE 12 OF 24

DATE January 25, 1972

GENERAL REFERENCES

1. 1962 - "Accident Prevention" by R. N. Janeway in Passenger Car Design and Highway Safety

2. July 29, 1966 - Memorandum of Decision by B. S. Jefferson, Judge of the Superior Court of the State of California in the case of Mary Jane Drummond & Don Lyford, Plaintiffs vs GMC Citizens Chevrolet Co. Roller Chevrolet Co., Defendants

3. September 9, 1966- Public Law 89-563, 89th Congress, S.3005

4. September 9, 1966- Public Law 89-564, 89th Congress, S.3052

5. July, 1968 - Cornell Aeronautical Laboratory, Inc. Preprint of "Standards for Safe Handling Characteristics of Automobiles," by W. F. Milliken, Jr. and F. Dell'Amico presented at the Joint Symposium on Vehicle and Road Design for Safety, College of Aeronautics, Cranfield, England

6. November, 1968 - "A Study of Volkswagen Accidents in the United States," (CAL Report No. VJ-1823-R32) by J. W. Garrett and A. Stern, Cornell Aeronautical Laboratory, Inc.

7. May 22, 1970 - Public Law 91-265, 91st Congress, H.R. 10105

DATE January 25, 1972

FILMS (Supplied by General Motors Corporation and DOT)

A-50	Free Control
A-53	Normal and Hard Driving
A-84	Fixed Steering Film - Corvair-outside
A-85	Fixed Steering Film - Falcon-in-Car
A-86	Fixed Steering Film - Falcon-outside
A-88	Skidpad Limit of Control - Corvair-in-Car
A-89	Skidpad Limit of Control - Corvair-outside
A-90	Skidpad Limit of Control - Falcon-in-Car
A-91	Skidpad Limit of Control - Falcon-outside
A-93	Film Showing the Effect of Ride Motions during Cornering - Corvair-in-Car
A-94	Film Showing the Effect of Ride Motions during Cornering - Corvair-outside
A-95	Film Showing the Effect of Ride Motions during Cornering - Falcon-in-Car
A-96	Film Showing the Effect of Ride Motions during Cornering - Falcon-outside
A-98	Film Showing J-Turns with and without Braking - Corvair-in-Car
A-99	Film Showing J-Turns with and without Braking - Corvair-outside
B-1	Film Showing J-Turns with and without Braking - Falcon-in-Car
B-2	Film Showing J-Turns with and without Braking - Falcon-outside
B-8	Ride and Handling Road Film - Corvair-in-Car
B-9	Ride and Handling Road Film - Falcon-in-Car

DATE January 25, 1972

B-12 Vehicle Evasive Performance - In-Car

B-13 Vehicle Evasive Performance - Outside view

B-29 Ramp Film - Corvair-outside

B-30 Critical Speed Film - Corvair-in-Car

Exhibit "N" - Film of Driving at the Drummond Accident Site (Suspension Camera)

Exhibit "M" - Film of Driving at the Drummond Accident Site (Inside Camera)

Exhibit #48 - O'Shea Pomona Film

Item III - A - 4, Movie Pomona & Willow Run Rollover Attempts

Exhibit #75 - O'Shea - Manos Film

Various DOT Films of Texas A&M Tests

Falcon versus Corvair - Ford Film

University of Michigan Test Film

BIOGRAPHICAL SKETCHES OF PANEL MEMBERS

DATE January 25, 1972

RAY W. CALDWELL

B.S. in Mechanical Engineering, University of Wisconsin.
M.B.A., Harvard Business School.
President of Autodynamics Corporation for past ten years.
Designed and developed a wide range of racing and specialty automobiles including FIA Group 7 road racing cars, Formula A, Formula Vee, Formula Super Vee and Formula Ford racing cars.
National SCCA driving championship in 1964 in a Formula Vee of own design.
Designed cars and managed professional racing team for SCCA Trans-American, Continental, and Canadian-American Championship series.
Holder of a commercial pilot's license with an instrument rating.

REPORT NO. A-3971

PAGE 16 OF 24

DATE January 25, 1972

EDWIN L. RESLER, JR.

B.S. in Aerospace Engineering, Notre Dame, 1947
Ph.D., Cornell University, 1951.
Director of Graduate School of Aerospace Engineering at Cornell for the past eight years.
Professor of Aerospace Engineering, Engineering Physics and Electrical Engineering at Cornell for the past fifteen years.
Fellow of American Institute of Aeronautics and Astronautics.
Member of Center for Radio Physics and Space Sciences, American Institute of Physics and American Physical Society.
Consultant to Avco-Everett Research Laboratory, Lansing Research Associates and Harry Diamond Laboratories.

DATE January 25, 1972

PAUL H. WRIGHT

B.S. in Civil Engineering, University of Tennessee, 1953.
M.S., University of Tennessee, 1958.
Ph.D., Georgia Institute of Technology, 1964.
Associate Professor of Civil Engineering for past four years at Georgia Institute of Technology.
Presently, Project Director for multidisciplinary research team conducting in-depth investigations of traffic accidents.
Served as principal investigator on five Traffic and Highway Engineering research projects.
Two years experience in the development of new subdivision road specifications and establishment of a soil laboratory.
Three years in U.S. Navy Civil Engineer Corps.
Registered Professional Engineer in Georgia.
Member of American Society of Civil Engineers, Operations Research Society of America.
Member of Sigma Xi and Chi Epsilon honorary engineering societies.
Associate Member of Institute of Traffic Engineers.

ADDENDUM

DATE June 6, 1972

On 12 April 1972 the panel reconvened at D.O.T. The following persons were present:

Andrew Detrick - D.O.T.
M. J. Lilley - D.O.T.
E. Wittich - D.O.T.
E. French - D.O.T.
F. A. Berndt - D.O.T.
P. H. Wright - Georgia Institute of Technology
E. L. Resler - Cornell University
R. W. Caldwell - Autodynamics Corporation
H. E. Holt - General Testing Laboratories - Recorder

The panel was asked to examine and evaluate additional information which was obtained by NHTSA subsequent to the submission of the panel report dated 25 January 1972. The information presented included graphic data from General Motors, Ford, and MIRA which described in a more quantified manner the understeer-oversteer characteristics of the 1960-1963 Corvair and several other automobiles. These data from constant radius skid pad tests made it possible to plot steering wheel angle in degrees versus lateral acceleration in g's.

An additional meeting was called by the panel on 2 and 3 June 1972. At that time this addendum was drafted and approved by the panel members.

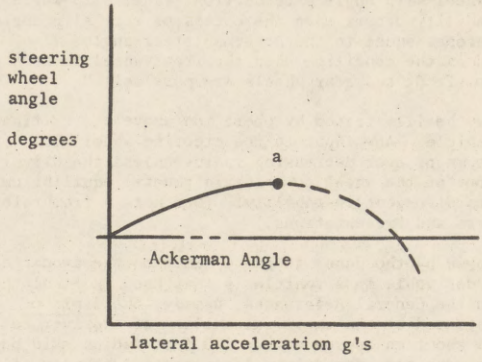
In an effort to assist in determining the significance of the understeer-oversteer transition with regard to Corvair stability and controllability, the panel submits the following definitions and charts.

The definitions of understeer, neutral steer and oversteer are important in order to eliminate any possible confusion in this discussion. These definitions, in general terms, are as follows:

If, when an automobile is on a constant radius circular path, an incremental speed increase requires additional turning toward the center of the circle to maintain the path, then the vehicle is in an understeering mode. If the incremental speed increase on the constant radius path requires no additional steering input, the vehicle is in a neutral steering mode. If the incremental speed increase on the constant radius path requires a steering input in a direction away from the center of the circle, then the vehicle is in an oversteering mode.

DATE June 6, 1972

FIGURE 1



——— understeer (positive slope of curve)
a neutral steer point (zero slope of curve)
– – – – oversteer (negative slope of curve)

Divergent instability exists at a prescribed trim if any small temporary disturbance or control input causes an ever increasing vehicle response without oscillation. (See reference number 3 in the SAE Papers and Presentations.)

At the time of the Corvair's design this concept was well understood as verified by the following quotation by R. N. Janeway from page 48 of reference number 1 in the General References:

"Although other investigators had made a beginning in a mathematical approach of the dynamic stability problem, the Cornell Aeronautical Laboratory in recent years has carried out an extensive analytical and experimental program in this field. Five papers covering this work were compiled by the Institution of Mechanical Engineers in 1956. Of these,

DATE June 6, 1972

the contributions of Leonard Segal and W. F. Milliken and D. W. Whitcomb are particularly pertinent to this discussion. Milliken and Whitcomb have derived an equation for critical speed beyond which the vehicle becomes unstable under steady state or transient conditions. Their equation proves that: (1) Instability can only occur under oversteering conditions, i.e., rear-wheel slip angle exceeds front-wheel slip angle requirement. (2) Instability occurs when the excess of rear slip angle over front slip angle becomes equal to the Ackerman steer angle... Item (2) can be restated as the condition when the front-wheel steer angle has been reduced to zero (front and rear wheels are parallel)."

Divergent instability may be illustrated by operation above the critical speed of an oversteer vehicle. Any input to the steering wheel will place the vehicle in a turn of ever decreasing radius unless the driver makes compensating motions of the wheel to maintain general equilibrium. This condition represents divergent instability. (See note 9 from reference number 3 in the SAE Papers and Presentations.)

Another definition employed by the panel to put a limit on the amount of oversteer or understeer desirable in a vehicle is that used by F. Winchell in reference number 8 in the General References, namely, the limit of control. This is demonstrated by the empirical ability of a driver to maintain a circular path about an approximately 100 foot radius skid pad for 3 complete laps. In some cars the driver loses control because of excessive oversteer and in other cars the driver loses control because of excessive understeer.

Control Sensitivity is defined as the change in steady state lateral acceleration per unit change in reference steer angle at a given trim. (See reference number 3 in the SAE Papers and Presentations.)

Two corollaries to this definition are as follows:

a. Infinite control sensitivity is the condition where any steering control input produces infinite vehicle response.

b. Zero control sensitivity is the condition where infinite steering control input produces no vehicle response.

These definitions serve to clarify the chart shown in Figure 2.

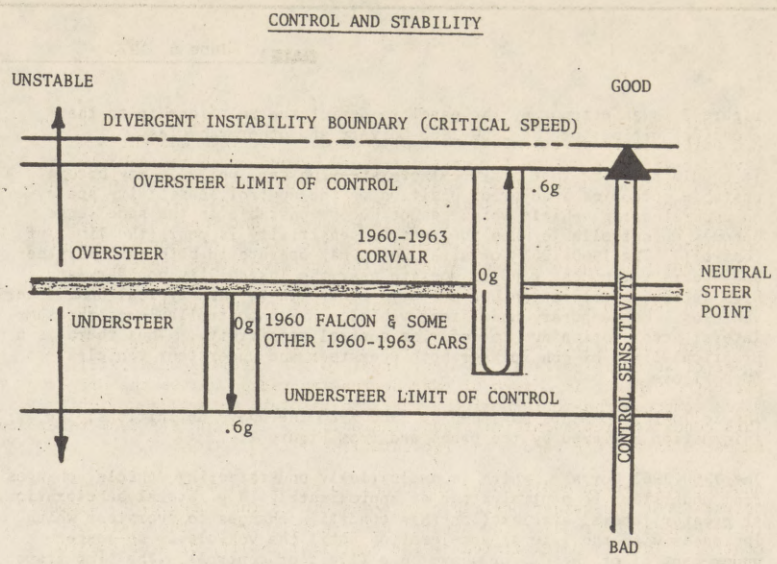

CONTROL AND STABILITY
UNSTABLE
GOOD
DIVERGENT INSTABILITY BOUNDARY (CRITICAL SPEED)
OVERSTEER LIMIT OF CONTROL
.6g
1960-1963
CORVAIR
OVERSTEER
0g
NEUTRAL
STEER
POINT
UNDERSTEER
0g
1960 FALCON & SOME
OTHER 1960-1963 CARS
UNDERSTEER LIMIT OF CONTROL
.6g
CONTROL SENSITIVITY
BAD

FIGURE 2

DATE June 6, 1972

Figure 2 is an attempt by the panel to depict the relationship to the above definitions of the 1960-1963 Corvair and other vehicles.

It should be noted that a typical oversteering car, while it may become unstable, occupies a superior position on the control sensitivity scale. An understeering vehicle which cannot become unstable in the same sense becomes uncontrollable when the control sensitivity is poor (the limit of control). The 1960-1963 Corvairs, which may operate in both the oversteer and understeer modes, tend to operate near the instability boundary at high lateral acceleration but are more controllable than typical understeering vehicles. Contemporary understeer vehicles are uncontrollable at the same lateral acceleration due to inferior control sensitivity. Thus there is a practical limit of control for both oversteer and understeer vehicles. (See Figure 2.)

The following comments may then be made from the above definitions, the information reviewed by the panel and from Figure 2.

The 1960-1963 Corvair, which is an initially understeering vehicle, changes from understeer to neutral steer at approximately .4 g lateral acceleration. At greater lateral acceleration this condition changes to oversteer which increases with the lateral acceleration until the vehicle is no longer under control of the driver above .6 g (limit of control). The time frame within which the transition occurs is a function of vehicle speed and trim, but the amount of steering wheel correction or steering change required to maintain a constant 108 foot radius is only about 50 degrees of steering wheel motion from .4 g to .6 g.

By comparison, a 1967 Chevrolet sedan and 1967 Chevrolet station wagon, both of which are understeering vehicles, require approximately 175 degrees of steering wheel movement, respectively, to maintain the same steady state conditions.

This means that the Corvair has greater control sensitivity than these vehicles as well as greater control sensitivity than contemporary vehicles. Note that all of these vehicles are operating at their limit of control.

Using these criteria with the Corvair in the oversteer condition, it is seen that at .6 g lateral acceleration the 1960-1963 Corvair is nearer the divergent instability boundary in the controllable range than any vehicle for which the panel has data.

DATE June 6, 1972

Although the 1960-1963 Corvair does oversteer from .4 g to .6 g, it is not unstable and the control sensitivity is superior to that of contemporary vehicles in the sense that less steering input is required for a desired maneuver.

While it is true that only an oversteering car can be divergently unstable, oversteering does not necessarily imply instability. Indeed, the data supplied to the panel showed the Corvair to be stable in the range from 0 g to .6 g laterally.

In summary, these subsequent deliberations have only reinforced the panel's convictions stated on page 6 of the original report.

The panel therefore concludes the following:

1. The conclusions and recommendations in the original report are reasonable, appropriate and sound.

2. The 1960-1963 Corvair, as well as other contemporary cars, is controllable in the lateral acceleration range from 0 g to .6 g.

3. The 1960-1963 Corvair in the oversteer mode, due to its better control sensitivity has greater maneuverability in the hands of a skilled driver than a contemporary car has.

4. The transition in the 1960-1963 Corvair from understeer at approximately .4 g lateral acceleration with its attendant control reversal may confuse drivers unfamiliar with this characteristic. Because some current vehicles exhibit similar handling characteristics, efforts to quantify stability and control limits for handling must be continued. Only then can precise determinations of safe or unsafe vehicle handling characteristics be made.

EVALUATION OF THE 1960-1963 CORVAIR HANDLING AND STABILITY



JULY 1972

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
WASHINGTON, D.C. 20590

TABLE OF CONTENTS

I. SUMMARY 1

II. INTRODUCTION 3

III. DISCUSSION 6

A. General 6

B. Analysis of General Motors Documents and Related Material . 11

1. Purpose & Scope 11

2. Background 11

3. Control Characteristics 12

a. General Discussion 12

b. Transition from Understeer to Oversteer 21

c. Beyond Limit of Control 25

d. Rollover 25

4. Analysis of Documents Commented on By Engineers Cited by Mr. Nader 34

a. NHTSA Comments on General Motors PG Reports 15699 and 17103 34

b. NHTSA Analysis of Comments by Messrs. Smith, Fonda, and Sergay 35

c. Analysis of 1960 Falcon-Corvair Comparison Film . . . 40

C. Input-Response Test Program 53

1. Purpose 53

2. Scope 53

3. Background 53

4. Vehicles and Facilities 57

5. Comparison of Test Data 59

IV. CONCLUSION 91

V. LIST OF ILLUSTRATIONS 94

VI. DOCUMENTS ANALYZED 97

APPENDIX I 103

Letter - Mr. Nader to Secretary Volpe, dated September 4, 1970

APPENDIX II 111

Letter - Mr. Nader to Secretary Volpe, dated December 15, 1970

APPENDIX III. 125

Letter - Mr. Nader to Secretary Volpe, dated February 23, 1971

APPENDIX IV. 129

Letter - Mr. G. B. Sellers, a R. Nader associate, to R. A. Diaz, Acting Associate Director, Motor Vehicle Programs, NHTSA

I. SUMMARY

In September 1970 the National Highway Traffic Safety Administration (NHTSA), Department of Transportation, began an evaluation of the handling and stability characteristics of the 1960-1963 Corvair vehicle, beginning with review of General Motors Corporation documents and test data. The existence of some of this information had been called to the Government's attention by Mr. Ralph Nader.

Analysis of General Motors documents, technical literature, and all available accident data was followed by a concentrated program of Government testing of the Corvair and contemporary vehicles during the spring and summer of 1971. Input-response type dynamic tests which could provide quantitative data were selected for this comparative test program. Support for the tests, conducted at College Station, Texas, was provided by the Texas Transportation Institute (TTI), Texas A&M Research Foundation. Testing was completed by July 15, 1971. Test data were reduced by TTI during the late summer and fall of 1971, and NHTSA analyzed the data as it became available.

To evaluate the objectivity of NHTSA testing and analysis, a three-man Advisory Panel of independent professional engineers was retained. The charge to the Panel was to review the scope and competence of the NHTSA investigation and specifically to identify any additional vehicle testing believed to be necessary to an objective, professional decision regarding the handling and stability characteristics of the 1960-1963 Corvair as a possible safety defect.

85-820 O - 73 - 15

Evaluation of the extensive data obtained from General Motors and from other sources, analysis of the NHTSA input-response vehicle test data, and recommendations from the Advisory Panel employed in this case indicate that:

The 1960-1963 Corvair understeers in the same manner as conventional passenger cars up to about 0.4g lateral acceleration, makes a transition from understeer, through neutral steer, to oversteer in a range from about 0.4g to 0.5g lateral acceleration, and reaches its limit of control at 0.6g sustained lateral acceleration. This transition does not result in abnormal potential for loss of control.

The limited accident data available indicates that the rollover rate of the 1960-1963 Corvair is comparable to other light domestic cars.

The 1960-1963 Corvair compared favorably with the other contemporary vehicles used in the NHTSA Input Response Tests.

The handling and stability performance of the 1960-1963 Corvair does not result in an abnormal potential for loss of control or rollover and it is at least as good as the performance of some contemporary vehicles both foreign and domestic.

II. INTRODUCTION

The sequence of events that led to a Department of Transportation (DOT) decision to conduct extensive tests of the handling and stability characteristics of the 1960 through 1963 Corvair automobile began with a September 4, 1970, letter (Appendix I) from Mr. Ralph Nader to John A. Volpe, Secretary of Transportation. As a result of this input, the National Highway Traffic Safety Administration (NHTSA) undertook to analyze the vast amount of test data, documents, films, and other information known to General Motors (GM) about the design, testing, production, and use of the Corvair vehicle and to correlate this information with accident data and independent articles in the technical literature regarding Corvair performance.

This comprehensive analysis was completed by the end of December 1970. Mr. Nader wrote again to Secretary Volpe on December 15, 1970 (Appendix II) on the same subject, citing two specific GM proving ground reports that he felt were particularly critical to the case. These reports had been included in the NHTSA analysis.

Following receipt of a third letter from Mr. Nader to Secretary Volpe dated February 23, 1971 (Appendix III), the DOT, NHTSA initiated plans to compare the handling and stability characteristics of the 1960-1963 Corvair with the same characteristics of contemporary vehicles, through the use of a series of handling maneuvers. After a thorough in-house examination of vehicle handling state-of-the-art, a program of testing using input-response type vehicle

dynamic tests, similar to those developed under Contract FH-11-7297 by the University of Michigan Highway Safety Research Institute (HSRI), was decided upon.

A contract (DOT-HS-065-1-077) was signed with the Texas Transportation Institute (TTI), Texas A&M Research Foundation, College Station, Texas, for use of the necessary facilities and support services. The testing program, supervised by NHTSA engineers, began in Texas in early March 1971. A subsequent letter from Mr. Gary B. Sellers, a Ralph Nader associate, to Mr. Rodolfo A. Diaz, Acting Associate Director, Motor Vehicle Programs, NHTSA, dated March 17, 1971 (Appendix IV), contained suggestions regarding testing procedure. Most of these suggestions were being implemented in the NHTSA testing plan. Because of program constraints, it was not feasible to test the vehicles under all of the suggested combinations of conditions.

The actual testing, conducted on a seven-days per week basis, was completed on July 15, 1971. A final report of individual vehicle test results was submitted by TTI in November 1971.

When the actual test phase was completed and the voluminous test data were reduced, NHTSA engineers began an analysis of test results. This analysis is documented in Part II, B. 1 of this report.

As the test program neared completion, the NHTSA Administration, in order to obtain an independent professional evaluation of Corvair handling performance, convened an Advisory Panel of three men with diversified professional

engineering backgrounds to look at all of the work done by NHTSA in analyzing the GM documents and in conducting the input-response tests in Texas. The Panel was instructed to determine whether the Government had done all that was reasonably necessary to a sound decision by the Administrator regarding the safety aspects of Corvair handling. Specifically, the Panel was requested to advise regarding any further testing necessary to a professionally sound basis for decision. The Panel met with NHTSA personnel on September 15-16, 1971, to obtain understanding of the NHTSA work to date. At that time, the Panel members received, for their independent analyses, an extensive and comprehensive set of documents, including the GM data, the Texas test data, and related technical literature and accident data. The Panel presented its initial findings at a meeting with the Administrator on December 15, 1971. The final Advisory Panel report was submitted in June 1972.

III. DISCUSSION

A. General: The Current State-of-the-Art

In the NHTSA evaluation of Corvair handling performance, two major questions were identified at the outset: (1) what was the current state-of-the-art in vehicle handling? and (2) what characteristics with respect to vehicle handling should be considered in making a determination of whether a safety related defect exists or does not exist?

The first question about the state-of-the-art in vehicle handling involves consideration of the existence of any standard for vehicle handling, the validity of different types of tests, the necessary scope of tests, and the necessary facilities and resources required for the conduct of tests? At present, there is no Federal Motor Vehicle Safety Standard for vehicle handling. Extensive research is being conducted by both the automotive industry and by Government in vehicle handling concepts. There is as yet no agreement among researchers as to the type of test best suited to a vehicle handling standard. The NHTSA research approach currently emphasizes input-response, vehicle dynamic tests (see discussion below), and these are the criteria now being tried in the development of a proposed Federal Motor Vehicle Safety Standard for Vehicle Handling.

The second question as to what characteristics should be considered was also studied quite carefully. The NHTSA analysis of the GM documents and related material was an examination of past events, and the significant handling criteria reviewed included limit of control tests, rollover tests, general proving ground tests, and tests of vehicles in the actual user operating environment. When it was decided that the Government would conduct additional testing of the 1960-1963 Corvair two test approaches were considered for comparison of handling and stability of contemporary vehicles: (1) Task Performance, and (2) Input-Response.

Task Performance tests, which include the driver-vehicle interface, were ruled out because of the inability to quantitatively measure the driver inputs and reactions.

Input-Response tests, eliminating the human driver as a controller and providing quantitative measurement of vehicle dynamics, were selected for the Government evaluation.

The question then became what input-response tests procedures should be used? As mentioned in the Introduction, HSRI had conducted a group of input-response tests under contract with NHTSA. The purpose had

been to develop an automatic vehicle controller capable of being programmed for accurate repetition of a variety of steering and braking control inputs.

As of March 1971, the NHTSA had in preparation a proposal for additional vehicle handling testing which incorporated input-response maneuvers selected for use as a basic guide in the Texas test program. It is important to note that, while these tests were designed to employ instrumentation and finite measurements yielding quantitative data, they had never been validated nor had they been correlated with actual driving maneuvers.

In Mr. Seller's letter of March 17, 1971, suggestions regarding the testing procedure were offered. Most of these were incorporated in the test program, as follows:

> All the suggested vehicles, a 1962 Falcon, a 1960 Valiant, a 1963 Corvair, and a 1967 Corvair, were included. In addition, two rear-engine imports, a 1962 Volkswagen and a 1963 Renault, were tested to cover the range of contemporary vehicles used on the highway. The Corvair and all other vehicles were tested only in their standard production configurations.

The tests incorporated maneuvers that represented dynamic or transient maneuvers, such as the J-turn or the hard hairpin turn, modified "J"-turns, and other avoidance maneuvers with braking in turns. All tests were conducted on high coefficient dry pavement; vehicle movements from gravel to pavement were not included.

Off-design tire pressures were used on all vehicles tested in one maneuver, Steady Turn-Rough Road.

The skid number (effective coefficient of friction) of the surface used was the (highest) range found on the modern highway under dry conditions. The test requirements specified that the road surface had to have a skid number between 70 and 80 when measured in accordance with ASTM Method E-274-65T at 40 miles per hour. These conditions were met.

All vehicles were tested in a condition that represented the manufactuer's maximum recommended load.

All the test vehicles were equipped with instrumentation to measure acceleration and other relevant vehicle response and outriggers were provided to prevent overturning.

In addition, as suggested, a 24-hour guard was provided at the test site by an independent security guard agency to prevent any tampering with vehicles under tests. A request for the presence of independent outside observers was not granted.

B. Analysis of General Motors Documents and Related Material

1. Purpose and Scope

This analysis undertook to review and evaluate selected General Motors data specifically referenced by Mr. Ralph Nader, additional relevant General Motors and other manufacturers' data, Society of Automotive Engineers papers, and other technical publications concerning 1960-1963 Corvair handling and stability.

2. Background

The area of automotive production design, development and performance as it related to vehicle handling characteristics, is an area dependent upon the exercise of subjective engineering judgment. Satisfactory performance, as determined by this subjective evaluation, includes safe performance in the reasonable and normal operation of the vehicle, as well as in extreme maneuvers which may be encountered in some accident avoidance situations.

The dynamic results produced by the interaction of the driver, the vehicle, and the environment vary considerably, and research is underway in the private sector, as well as in Government, to improve the understanding of these relationships.

The subjectivity of handling evaluation, and the existing controversy over what even constitutes a good and safe handling vehicle, are exemplified by the absence of any Federal or voluntary minimum acceptable performance standards dealing with vehicle handling.

Research by the National Highway Traffic Safety Administration is developing a set of test procedures preliminary to the establishment of minimum

vehicle handling performance levels that can be expressed in objective terms to form the basis for a definitive standard. These procedures indicate a promising approach to handling definition but require much additional refinement through additional research to correlate the procedures with actual road and operating conditions experienced by a broad cross section of vehicles.

Recognizing then the absence of known and acceptable quantitative techniques permitting analysis in terms of absolute values for minimum acceptable safe handling performance characteristics, this analysis relies in great measure upon a general comparison of the handling performance characteristics of the Corvair with those of contemporary vehicles. In making this comparison, reference is made to a lateral acceleration limit of control for individual vehicles which is established by skilled test drivers but not considered to be an absolute value. Also used in the comparison are available data drawn from accident records to show the frequency of accidents with major damage resulting from rollover.

3. Control Characteristics

a. General Discussion

In order to evaluate vehicle dynamics in a turn, it is necessary to describe the meaning of the terms understeer and oversteer. Simply stated, an understeering vehicle will generate a larger radius with increasing lateral acceleration without any change in steering angle. Under the same conditions, an oversteering vehicle will tend to generate a smaller radius, with increasing lateral acceleration, without any change in steering angle. (See Illustration No. 1)

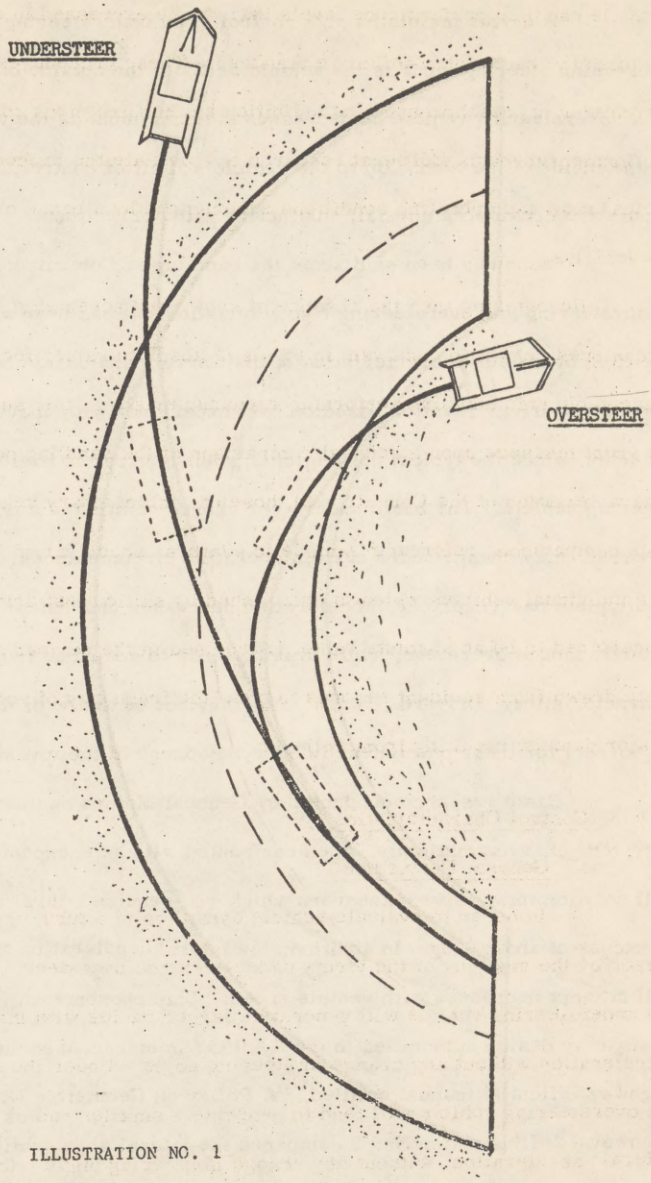


ILLUSTRATION NO. 1

OVERSTEER OR UNDERSTEER, AT LIMIT OF CONTROL, OR WITHOUT STEERING CORRECTION

A driver maintains path control of an understeering vehicle by increasing steering input as the vehicle drifts to the outside of a turn, while in an oversteering vehicle he decreases steering input as the vehicle drifts to the inside of the turn. Up to the vehicle's limit of control, these steering inputs are considered normal, instinctive path corrections.

Much has been said about the handling of Corvair concerning its understeering and oversteering characteristics. It has been alleged that the final oversteer characteristics of the Corvair are unsafe because of instinctive driver reaction based on past experience with understeering vehicles, since the typical conventional passenger car is basically an understeering vehicle. The basic understeer characteristics of a conventional car, however, may change under certain operating circumstances. For example, in a typical passenger car, acceleration decreases understeer and may actually induce oversteer, while braking tends to accentuate understeering characteristics. Drivers, though they may not be aware of their actions, do correct for these phenomena in everyday usage of their vehicles.

Basic research conducted by General Motors has established that a driver, characteristically, when confronted with an unexpected obstacle, will not attempt evasive maneuvers which will require lateral accelerations in excess of about 0.3g. In addition, the lateral acceleration that a driver will attempt decreases with vehicle speed. This phenomenon is substantiated by highway design authorities in the AASHO (American Association of State Highway Officials) manual entitled, "A Policy on Geometric Design of Rural Highways." Illustration No. 2 compares the lateral acceleration capability of typical American cars with AASHO design criteria. As can be clearly

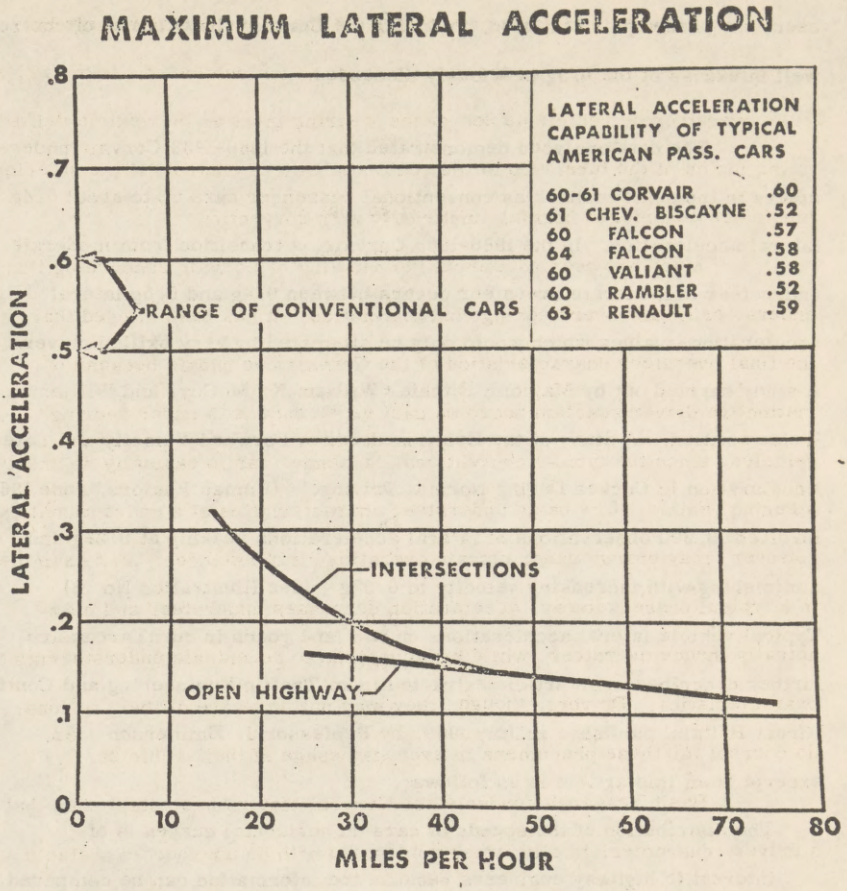


ILLUSTRATION NO. 2

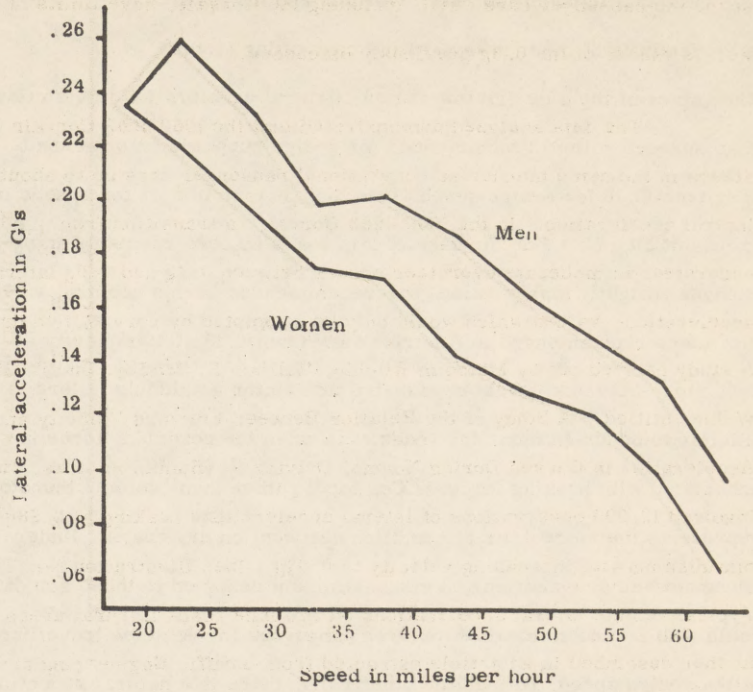
PRESENTED BY GENERAL MOTORS CORPORATION TO THE MICHIGAN STATE HEARINGS CONCERNING MICHIGAN SENATE BILL NO. 766-773.

FEBRUARY 21, 1966

seen, the passenger cars cited, including the Corvair, have limits of control well in excess of the 0.3g previously discussed.

The data analyzed demonstrated that the 1960-1963 Corvair understeers in the same manner as conventional passenger cars up to about 0.4g lateral acceleration. In the 1960-1963 Corvair, a transition from moderate understeer to moderate oversteer occurs between 0.4g and 0.5g lateral acceleration--values which would only be attempted by very skilled drivers. A study carried out by Malcolm Ritchie, William K. McCoy, and William L. Welde entitled, "A Study of the Relation Between Forward Velocity and Lateral Acceleration in Curves During Normal Driving." (Human Factors, June 1968), involved 10,290 observations of lateral accelerations peaking at 0.26g and diminishing with increasing velocity to 0.07g. (See Illustration No. 3) Typical vehicle lateral accelerations on two lane roads in rural areas are further described in an article extracted from Traffic Engineering and Control (Great Britain) published in July 1969, by Professor J. Emmerson. An excerpt from this article is as follows:

> The distribution of the speeds of cars on horizontal curves is of interest to highway engineers because the information can be compared to the theoretical speeds for which the curves have been designed. The Ministry of Transport defines design speed as:
>
> > The design speed of a highway is that chosen for the correlation of such features as sight distance, curvature and superelevation upon which the safe operation of vehicles depends. It is the maximum speed maintainable throughout the journey compatible with safety and comfort when weather



Lateral acceleration as a function of speed in curves. Speed values are the divicing points between groups. Based on 10,290 observations.

M. Richie, W. McCoy and Welde Study
HUMAN FACTORS JUNE 1968

Illustration No. 3

85-820 O - 73 - 16

and traffic conditions are favorable and the geometric features of the highway are the controlling factors.

The values of the side-friction factor (lateral acceleration in g's minus road superelevation) recommended for design purposes on open roads vary from 0.18 for design speeds less than 30 mph to 0.15 for speeds in excess of 30 mph. For the case of slip roads (access ramps) at interchanges, slightly higher values are recommended in this country, whereas the values recommended in America vary from 0.16 at 40 mph up to 0.32 at 15 mph. At these levels of side-friction factor a skidding failure is unlikely to occur on most dry roads even when the cornering force is associated with braking force. "Comfort" rather than "safety" therefore represents the more critical condition, at least on dry roads. Under adverse weather conditions, a road alignment designed to those standards could well be uncomfortable" or even dangerous for vehicles travelling at the design speed, but, on the other hand, there is a natural reduction in vehicle speeds in bad weather irrespective of alignment which tends to compensate.

A number of tests have been carried out in other countries to measure side-friction factors either indirectly by measuring vehicle speeds--or more directly by means of ball-bank indicators or accelerometers. In this country the work of Leeming and Black and of Warren and Hazeldine is frequently quoted. In all tests, considerable variations in the uses of side-friction factors occur. Warren and Hazeldine report variations from 0.17 to 0.33 while Leeming and Black found that the average observer would rate 15 percent of the curves tested as uncomfortable when a value

of 0.15 was experienced. Taragin found that the side-friction factors used by cars travelling at the average speed was about one-half of the value used by cars travelling at the 95th percentile speed. Average factors varied from about 0.08 on curves of 1,470 feet radius to about 0.20 on curves at 240 feet radius. This article describes the results of speed tests on cars at six sites on horizontal curves along two-lane roads in rural areas of Cheshire and Lancashire."

Data supplied by General Motors and Testimony by Dr. Thomas Manos, expert witness for plaintiffs in cases against GM, have established that a sustained lateral acceleration of 0.6g is the limit of control for the 1960-1963 Corvair; that is, 0.6g is the value beyond which the vehicles can no longer be maintained under control by the most skilled driver. This value, when viewed with other limit of control values, illustrates that the Corvair compares favorably with contemporary passenger cars. (See Illustration No. 4) It also was observed in GM films and reported on at least one road test (Autocar, January 6, 1961) that wheel hop (patter) occurs prior to incipient vehicle breakaway, at which time the Corvair can still be controlled, indicating that discernible warning is given to the driver prior to the limit of control.

Data were also scrutinized to determine if the 1960-1963 Corvair had a critical speed within the realm of its performance capabilities. A critical speed, that is, a speed beyond which the vehicle cannot be maintained under control in a straight line, is theoretically possible in an oversteering vehicle. One film reviewed (General Motors Film No. B-30, titled "Critical Speed Film) demonstrated that the Corvair did not have a critical speed, i.e., vehicle yaw oscillations were damped out without driver assistance after the induction

MEASURED MAXIMUM LATERAL ACCELERATION

AT LIMIT OF CONTROL

OF DOMESTIC AND FOREIGN PASSENGER CARS

Year	Name	Lat. Accel. "G" Units
1960	Rambler	0.52
1960	Falcon	0.57
1960	Valiant	0.58
1961	Chevrolet (Biscayne)	0.52
1961	Corvair	0.60
1964	Renault (Dauphine)	0.59
1964	Falcon	0.58
1964	Valiant	0.60
1964	Cadillac	0.59
1964	Chevrolet (Chevelle)	0.59
1964	Chevrolet (Chevy II)	0.59
1964	Volkswagen	0.57
1964	Opel	0.61
1964	Vauxhall	0.55
1964	Corvette	0.69
1964	Corvair	0.68
1965	Rambler Amer.	0.60
1965	Falcon	0.59
1965	Valiant	0.58
1965	Cadillac	0.60
1965	Chevrolet (Chevelle)	0.55
1965	Chevrolet (Chevy II)	0.58
1965	Chevrolet (Impala)	0.61
1965	Volkswagen	0.57
1965	Mercedes "600"	0.62
1965	Buick Electra	0.64
1965	Ford Fairlane	0.62
1965	Corvair	0.70

ILLUSTRATION NO. 4

PRESENTED BY GENERAL MOTORS CORPORATION

TO THE MICHIGAN STATE HEARINGS

CONCERNING MICHIGAN SENATE BILL NO. 766-733

of a transient (step steering input and release at 80 mph). Simply stated, with the vehicle travelling in a straight line at about 80 mph (maximum speed) the driver rotated the steering wheel as quickly as possible through a pre-determined arc and immediately released it, leaving the vehicle free to seek its own path. The "fishtailing" motions of the vehicle diminished rapidly and the vehicle resumed its course. For comparative purposes, in another film a conventional contemporary automobile under comparable conditions did exhibit divergent yaw oscillations, i.e., "fishtailing" motions increased rapidly and the vehicle would have gone out of control had not the driver intervened.

b. Transition from Understeer to Oversteer

The analysis has examined, within the limits of available data, the predictability of the Corvair performance during the transition from understeer through neutral steer to oversteer. The question asked was: Does the transition from understeer to oversteer occur abruptly without warning, leaving the driver with insufficient time to take appropriate action?

In evaluating this transition, as indicated earlier, limitations in the state-of-the-art of vehicle control have been a serious constraint. Neither Government nor industry research has been successful in quantifying the quality of vehicle control characteristics, particularly those involving lateral dynamics. Vehicle controllability is directly related to the degree of difficulty experienced by a driver in keeping a vehicle on a desired course. The driver, the vehicle, and the course are all interrelated elements of control. Optimum or compatible vehicle qualities are difficult

to define without a definition of the driver, his level of skill, habits, and performance. Little work has been done to quantitatively relate vehicle control characteristics to suitably derived criteria of operational safety or accident reduction.

It has been established (as discussed on pages 13-18) that the average driver will not normally attempt maneuvers involving more than 0.3g lateral acceleration at low speeds and the lateral acceleration he is willing to attempt is reduced even further as the vehicle speed increases. In view of this, it is apparent that the driver is not likely to experience the Corvair transition from understeer to oversteer in normal driving except possibly at very low speeds.

In an extreme situation, when a driver involuntarily encounters lateral acceleration of 0.4g - 0.5g (Corvair's transitional state), he typically makes a brake application resulting in wheel lock up. In this situation, both understeering and oversteering vehicles are uncontrollable. When encountering this range of lateral acceleration, assuming the driver does not make a brake application, a considerable degree of skill still is necessary to maintain control of any vehicle.

If a driver does have the skill to drive at these levels of lateral acceleration (0.4g to 0.5g), or is required to do so because of circumstances beyond his control, only a moderate amount of steering movement, either in understeer or oversteer, is required on the 1960-1963 Corvair. A driver is not likely to have any awareness of the transition without deliberately having some

reference and taking readings in some way as to change in steering wheel angle because of the normal variations in the steering wheel angle required to maintain path direction. As the driver makes the transition, he would not be making large increases in the steering wheel input and in a split second be required to make large decreases in the steering wheel input because of the vehicle's characteristics. The rate of the transition will be dependent upon vehicle speed and the severity of the immediate maneuver.

For the lateral acceleration range of 0.5g to 0.6g the 1960-1963 Corvair is in stable oversteer. The oversteer does not become self-energizing or unstable until the limit of control is exceeded. Figure 4 in SAE Handbook Supplement, Vehicle Dynamics Terminology, J670b illustrates this condition for the constant speed test. (See Illustration No. 5) In this Figure, the curve which represents the vehicle in an understeer mode that changes to an oversteer mode shows that the vehicle first is in stable or controllable oversteer from the neutral steer point to the divergent instability boundary. Beyond the divergent instability boundary, the oversteer becomes self-energizing and divergently unstable.

In the control of a vehicle it is not just a matter of having understeer or oversteer, but what is important is how much understeer or oversteer a vehicle has and how it responds to the driver's inputs. A vehicle with large amounts of either understeer or oversteer may be equally difficult to control.

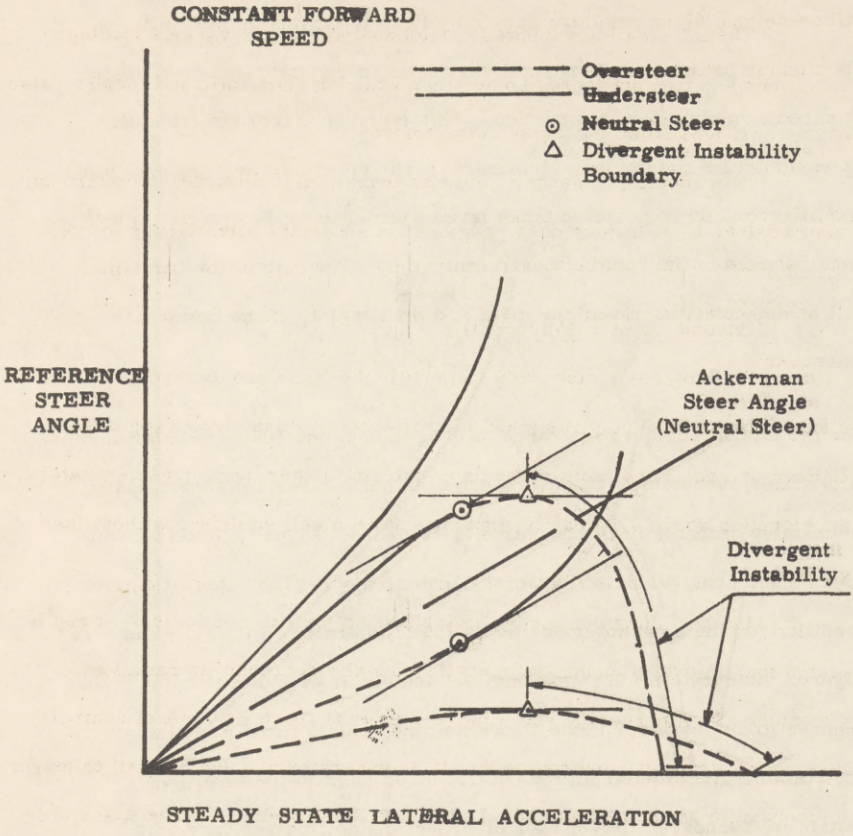


Fig. 4 - Steer Properties

SAE Handbook Supplement, Vehicle Dynamics Terminology, SAE J670b

Illustration No. 5

The information reviewed established that under various loading conditions and tire pressures some other vehicles, domestic and foreign, also have transitions from understeer to oversteer.

It is concluded that the Corvairs transition from understeer through neutral steer to oversteer does not result in abnormal potential for loss of control.

c. Beyond Limit of Control

As previously discussed (page 19), the films and data reviewed clearly show that during sustained lateral accelerations above 0.6g the Corvair is not controllable. The data indicate further that a transient lateral acceleration above 0.6g can be experienced by a skilled driver without loss of control.

In describing vehicle dynamics beyond the limit of control, it can be stated that an oversteering vehicle will normally decrease its radius of curvature at an increasing rate (that is spin-out) above its limit of control, dissipating its kinetic energy, whereas an understeering vehicle will endeavor to proceed in a straight path, dissipating its kinetic energy. There are pros and cons for both modes of breakaway. Depending on the circumstances, the modes may be equally hazardous.

d. Rollover

Given certain circumstances virtually every automobile can be made to roll over. In the Twelfth Stapp Car Crash Conference, Mr. John W. Garrett, ACIR, CAL, Inc. (Automotive Accident Crash Injury Research,

Cornell Aeronautical Laboratory, Inc.) in his report, "A Study of Rollover in Rural United States Automobile Accidents," concluded that the rollover frequency decreases as weight and tread width increase and car height decreases. Mr. Garrett's findings indicate that the Corvair and lighter American cars rolled over more frequently than heavier cars, whereas the popular four passenger lighter imports (Volkswagen and Renault) were involved in a higher proportion of rollovers than the Corvair. (See Illustrations Nos. 6 and 7).

Although data were obtained by Mr. Garrett from Utah and New Mexico in his study, the New Mexico data were not utilized in the analysis because these data did not include driver age. The Utah data were obtained during the period from September 1966 to August 1967 and involved 8,749 vehicles. Data, when standardized for driver age and traveling speed, indicate that the Corvair was involved in a lower percentage of rollover accidents than other light domestic cars.

While all Corvair models from 1960 through 1967 were included in the study, an estimate from Mr. Garrett indicates that at least 80 percent were 1963 and earlier models. Thus, the results primarily reflect the behavior of models of concern to this analysis. The other vehicles investigated included models up through 1968, as referred to in Illustration No. 6. A principal rollover is defined as an accident in which the major vehicle damage is associated with the rollover, although collision may also have occurred.

(EXTRACT)

Classification of Car Groups[a] According to Year and Make

Weight	Tread Width	Height	Vehicle
1	1	2	All Volkswagen, Renault
2	2	4	Corvair 60 to 67
3	3	4	Falcon 60-65/ Comet 60-65/ Chevy II 62-68/ Dart 62-67/ Tempest 61-63/ Lancer 61-62/ Valiant 60-67/ Buick Special 61-63/ F85 61-63/ Mustang (all years)/ Javelin, Cougar, Camaro, Firebird, American (all years)
....			
....			
....			

[a] Car groups based on weight, tread width, and height of vehicle. Data obtained from the annual Automotive News Almanac, Review and Reference Edition.

Illustration No. 6

(Proceedings of the 12th Stapp Car Crash Conference
October 1968, page 68)

(EXTRACT)

Frequency of Principal Rollover (Utah) %

Vehicle Group	Driver Age, years							Crude Rate	Standardized[a] Rate	n
	to 14	15-19	20-29	30-39	40-49	50-59	60+			
112	40.00	26.60	21.33	6.82	26.32	10.00	4.29	21.24	21.36	339
224	[b]	13.56	7.14	18.52	7.69	____	____	10.19	9.10	206
334	50.00	8.65	9.91	3.81	10.00	16.39	6.82	9.23	9.19	780
...										
										5888

[a]Standardardized on Driver Age

[b] ____ = no principal rollover among observed cases.

Frequency of Principal Rollover (Utah) %

Vehicle Group	Traveling Speed, mph				Crude Rate	Standardized[a] Rate	n
	to 19	20-39	40-59	60+			
112	[b] ____	2.90	25.19	46.25	22.57	20.20	319
224	____	2.08	10.81	22.64	10.88	9.51	193
334	____	3.03	13.67	27.23	13.11	11.81	702
...							
							5355

[a]Standardized on Traveling speed.

[b] ____ = no principal rollover among observed cases.

Note: Rollover rates were standardized separately on traveling speed and age of driver because it is known that these variables are associated with both vehicle type and rollover frequency. The method of standardization is described in Appendix 7, Technical Report, "A Study of Volkswagen Accidents in the U.S.A.", (CAL Report No. VJ-1823-R32) by J. W. Garrett and A. Stern, Cornell Aeronautical Laboratory, Inc., November 1968.

Illustration No. 7
(Proceedings of the 12th Stapp Car Crash Conference, October 1968, pages 69 and 70)

The principal rollover rate in percent of accidents investigated, standardized for driver age, is compared below:

	Principal Rollover Standardized Rate %
Volkswagen and Renault (Group 112)	21.36
Corvair (Group 224)	9.10
Light Conventional Domestic Cars (Group 334)	9.19

When standardized for traveling speed, the principal rollover rate in percent in accidents investigated was as follows:

	Principal Rollover Standardized Rate %
Volkswagen and Renault (Group 112)	20.20
Corvair (Group 224)	9.51
Light Conventional Domestic Cars (Group 334)	11.81

Mr. Garrett stated in his report that relatively few cars overturned when traveling speeds were below 40 mph. In general, rollover frequency was highest among young drivers in small cars and decreased as driver age and car size increased. In the Utah data, about 75 percent of the drivers of Volkswagens and Renaults (Group 112) and of Corvairs (Group 224) were under 30 years of age, and about 65 percent of the drivers in the category that includes many of the sports-type cars, light conventional domestic, (Group 334) were under 30 years of age.

Mr. Garrett said in his report that ". . . in the Utah data the majority of the Volkswagen and Corvair cars pre-dated major modification in the

suspension system. Thus, the findings largely reflect the behavior of those models manufactured before the suspension system changes were made."

Another study made by ACIR, CAL, Inc., "A Study of Volkswagen Accidents in the United States," dated November 1968, indicates that, when corrected for driver age, the Corvair and lighter American cars rolled over more frequently than heavier American cars, and the popular four passenger lighter imports (Volkswagen, Renault, Foreign Sedans) were involved in a higher percentage of rollovers than light American cars as a class. (See Illustration No. 8).

All the vehicles investigated in this study were 1966 or earlier models and again, as in the Utah data, at least 80 percent of the Corvairs were 1963 or earlier models, based on an estimate provided by Mr. Garrett. The principal rollover rate, without prior collision in this case, was as follows:

	Principal Rollover Rate Standardized for Driver Age %
Volkswagen	28.0
Renault	38.6
Foreign Sedans	20.8
Corvair	14.8
Light	10.9

These data indicate the Corvair was involved in a slightly higher percentage of rollover accidents than other contemporary light weight domestic automobiles.

(EXTRACT)

Percent Distribution of Accident Type Standardized by Driver Age

Car Group	Accident Type		
	Prin. Rollover*		
	Without Coll.	With Coll.	Secondary Rollover**
Volkswagen	28.0	12.6	4.4
Renault	38.6	16.8	6.8
Foreign Sedan	20.8	9.4	5.9
Corvair	14.8	10.5	2.8
Light	10.9	7.4	4.2
Intermediate	9.9	8.0	3.2
Heavy	7.5	6.7	1.6

* A principal rollover (PRO) is defined as an accident in which both collision and overturn of the car may occur, but major car damage is associated with the rollover.

** A secondary rollover is defined as an accident in which both collision and overturn of the car occur, but major car damage is associated with the collision.

Illustration No. 8

(CAL REPORT NO. VJ-1823-R32, A STUDY OF VOLKSWAGEN ACCIDENTS IN THE UNITED STATES, NOVEMBER 1968, PAGE 16)

In addition to examination of the ACIR, CAL, Inc., rollover data, the analysis included discussion of a University of North Carolina Highway Research Center report, Driver Injury in Automobile Accidents Involving Certain Car Models, with the author, Dr. B. J. Campbell. Purpose of discussion was to examine the possible relatedness of Dr. Campbell's data to the analysis of 1960-1963 Corvair handling and stability. Of the six variables used by Dr. Campbell for his study, the "Type of Accident" variable which contains the category "Car Ran Off the Roadway" is the one that relates most closely to the area of interest. This category includes all vehicles that ran off the roadway, for whatever reason, such as blowouts, fell asleep at the wheel, excessive speed, etc., before striking any object. It includes vehicles that went off the road and struck a tree, as well as those that went off the road without striking anything. Off highway rollovers are included in the category.

The data presented by Dr. Campbell for the Corvair indicated a reduction in the percentage of total accidents in the "Car Ran Off the Roadway" category from the level of model years 1965 through 1968. It was noted that these percentage shifts match the model years when changes were made in the Corvair, and this apparent relationship is logical. The significance of the magnitude of change in the data is uncertain, particularly in view of unexplained changes in the same data for other vehicles, such as the Chevy II and Valiant about which there is no knowledge of any pertinent changes in the vehicle during the related periods.

Due to differences in method of classifying accident data between Dr. Campbell's "North Carolina" study and the Cornell Aeronautical Laboratory, Inc., studies, it is not possible to correlate Dr. Campbell's data with the data already presented. To make Dr. Campbell's data comparable, it would be necessary to return to the accident reports and establish the categories "Principal Rollover Without Collision" and "Principal Rollover With Collision." Data then would have to be standardized for driver age and vehicle speed by classification of vehicle.

During the review of the numerous films of engineering and special tests, it was observed that many attempts involving extreme maneuvers designed to cause rollover were made by expert drivers before rollover actually occurred. In addition to the films involving extreme maneuvers designed to induce rollover, many of the others observed were for the purpose of demonstrating and evaluating vehicle handling characteristics involving the limits of control, as well as understeer and oversteer characteristics.

Frame-by-frame analysis of films supplied clearly established that wheel rim contact with the pavement is not the precipitating cause of Corvair rollover, but occurs in the course of rollover. Similarly, it has been established that while a moderate amount of positive camber and jacking at the rear wheels exists prior to rollover of the Corvair, tuckunder is not observed until the vehicle is well into a rollover mode. Tuckunder, therefore, is considered not to be a major contributor to Corvair rollovers.

85-820 O - 73 - 17

4. Analysis of Documents Commented on By Engineers Cited by Mr. Nader

a. NHTSA Comments on General Motors P. G. Reports 15699 and 17103

In Mr. Nader's letter of December 15, 1970, to Mr. Volpe (Appendix II), he cited two General Motors Proving Grounds reports--PG 15699 and PG 17103--which he asked the Department of Transportation to include in the investigation of the stability of the 1960-1963 Corvair. These two reports including the many supporting charts, photographs, and movie film had been received from General Motors three months previously. A thorough analysis had already been completed.

The General Motors tests, as explained in these reports, were conducted for the purpose of evaluating the roll stability characteristics of different suspension modifications on a 1962 and 1963 Corvair.

Ten different sets of test conditions with various modifications were evaluated in PG 15699 and eight test conditions with various modifications in PG 17103.

To conduct the tests and protect the driver the windshield and rear glass were removed, a set of roll bars installed, rear seat removed, and the vehicle interior padded.

The vehicles were equipped with accelerometers and potentiometers to measure the accelerations and motions resulting from the tests. A camera was mounted on the vehicles to record suspension motions.

The vehicles were driven by a professional test driver at increasing speed increments using rapid steering, maximum throttle and torque inputs designed to test the various suspension modifications to the point of rollover or until it was difficult to produce a more violent maneuver.

In summary, because of the nature and severity of these development tests which were not representative of the practical driving environment, these tests should not reasonably be interpreted to conclude that 1960-1963 Corvair is susceptible to rollover at low speeds on a flat surface in the normal driving environment.

b. NHTSA Analysis of Comments by Messrs. Smith, Fonda, and Sergay

Mr. Nader had solicited three engineers, Messrs. Smith, Fonda, and Sergay to analyze the reports for him. His letter to Mr. Volpe included responses to some specific questions that he had asked the engineers.

Some of the questions asked of Messrs. Smith, Fonda, and Sergay were the same, others were similar. When possible a comparison of their answers was made. The answers these men gave for one particular question many times conflicted with their own answers provided for other questions. Also the answers that Messrs. Fonda and Sergay gave conflicted in some cases with those of Mr. Smith.

In the first question the men were asked: "If you were a design engineer and saw PG 17103 or PG 15699 results on a prototype vehicle being considered for production, would you recommend the car for production without

modification?" All three men stated that they would not recommend any of the configurations for production because of the vehicle performance as it related to the rollover criterion, but later they all recommended modifications that were included in these reports.

Mr. Nader asked Messrs. Fonda and Sergay the question: "Are any of these test runs representative of the Corvairs which were actually produced and sold in 1960-63?" Their response was, "The vehicle of run 120 of PG 17103 appears in all (emphasis added) respects as being a vehicle representative of 1963 production Corvairs. . . ."

The vehicle used in run number 120 of PG 17103 was a 1962 Corvair with 1963 production shock absorbers. It had been used for 64 runs in PG 15699 and PG 17103 and had been rolled over 10 times before run number 120. The tenth rollover (run number 117) was a severe one. The vehicle had a set of roll bars installed, the windshield and back glass had all been removed, the rear and front wheel openings were cut out, the rear seat removed and the body had been deformed in the previous tests. The center of gravity had been shifted upward and rearward as a result of these modifications to the vehicle. The conditions described above show that the vehicle was in a test development configuration that was not representative of a 1962 or 1963 production Corvair.

A question was asked if the rollover and stability behavior of the 1960-1963 Corvair differed from the behavior of other American sedans and from foreign cars sold in the United States. Since no foreign vehicles were involved in these tests, the men had no comments as it related to the foreign vehicles. Only one other vehicle, a standard Chevrolet, was used in one of

the tests (PG 15699). Since only one other vehicle was used it would appear to be invalid for anyone to be able to extrapolate the results of that one vehicle to apply to all other vehicles from these two tests.

Messrs. Fonda and Sergay stated in answer to their question number 3 that a vehicle ". . .must slide instead of rolling over on a flat road surface, with any combination of driver actions. . . ."

The data and films analyzed by NHTSA in this study clearly indicate that other American vehicles can also be made to rollover on flat surfaces. As in the case of the Corvair, a considerable amount of effort is required to achieve rollover and it is difficult to repeat.

The actual rollover experience that Mr. Garrett reported (see Illustration No. 8) in his rollover reports indicated that the heavier, wider, American sedans were involved in fewer rollover accidents when corrected for driver age than the smaller, lighter sedans but all classes were involved in rollover accidents.

When the men were asked to comment as to their estimates as to the cost to modify the 1960-1963 Corvair to make them perform comparably to other American cars with rigid axles, that is, to make these vehicles skid or spin out rather than rollover, the answer by Messrs. Fonda and Sergay again conflicted with Mr. Smith's answer.

Messrs. Fonda and Sergay recommended the incorporation of hydraulic cutoff rear shocks at an estimated cost of $20 per car. This conflicts with Mr. Smith's estimate of $11 total for 4 springs, 2 rear shocks, a stabilizer bar and fittings, and two rebound straps.

The recommendation of the hydraulic rebound cutoff rear shocks by Messrs. Fonda and Sergay is inconsistent with their previous answers to their question number 3. The hydraulic rebound limiting cutoff shock absorber they recommended from run number 73 of PG 15699 was even longer than the 1963 production shock absorber which they said they would not recommend for production for the 1963 model. (The answer to their question number 3.) Also, run number 71 of PG 15699 which resulted in a rollover had exactly the same configuration as run number 73, except the rebound travel in run number 71 was limited by an additional one-half inch. There were many rollovers in PG 17103 in which rebound was restricted even more than in run number 73.

It appears that Mr. Smith in his recommendation was suggesting a package similar to the RPO 696. The configuration in PG 15699 that was similar to the RPO package did not prevent a rollover. Also the rebound straps used in the RPO package did not restrict the rebound camber angle any further than the 1963 or 1964 production hydraulic rebound cutoff shock absorbers.

The rebound could not be restricted further than that of the 1963 production vehicles because there would not be sufficient wheelhouse clearance to remove the wheel and tire assembly.

The information contained in the PG reports and films do not represent conditions that would be experienced in the practical driving environment. The maneuvers that the test driver used were maximum throttle-extreme steering inputs designed to produce rollover. This type of driving is not representative of the practical driving environment although it is used in research and development.

The testing performed by NHTSA at the Texas Transportation Institute under the fully loaded conditions recommended by Mr. Sellers (a Nader associate) demonstrated that the 1963 Corvair would spin out on a high coefficient of friction surface in violent maneuvers designed to induce rollover.

On the subject of the effect of vehicle degradation on vehicle rollover, Messrs. Fonda and Sergay contradicted Mr. Smith. Messrs. Fonda and Sergay did not feel that the degradation of the suspension components would effect the rollover characteristics of the 1960-1963 Corvair. Mr. Smith said he thought it would.

It must be pointed out, however, a failure of one component can lead to a catastrophic failure of the entire system of any vehicle and in no way is limited to the Corvair as Mr. Smith stated in his answer related to degradation.

The probability of injury to occupants of a vehicle spinning out of control on a highway or rolling over off the road is a matter of conjecture. Both types of accidents can be equally hazardous depending on the particular circumstances, such as contact with another vehicle or object.

Analysis was made of some of the estimates by Messrs. Fonda and Sergay. They stated that there were 600,000 1960-1963 Corvairs on the road at the time of their calculations. This figure was approximately 50 percent higher than the 407,922 R. L. Polk registeration figures reported six months earlier (July 1970). They then estimated that there would be about 100,000 1960-1963 Corvairs in use in 14 years. Current registeration trends indicate that this estimate would more likely be about 5,000 remaining. Their other estimates about vehicle life expectancy and potential accidents and injuries were based on these figures and consequently also reflected these discrepencies.

In summary, the conclusions and inferences by Mr. Nader's engineers do not appear warranted, because the vehicles used in these tests were in various states of test modifications and the nature and severity of these development tests were not representative of the practical driving environment.

c. Analysis of 1960 Falcon-Corvair Comparison Film

The National Highway Traffic Safety Administration became aware of the existence of Ford Motor Company information concerning the 1960-1963 Corvair handling qualities in June 1971 when a copy of a letter was received from Mr. Harley Copp (a Ford Motor Company executive) written to Senator Warren G. Magnuson, Chairman of the Senate Commerce Committee.

An Information Request dated June 15, 1971, was sent to the Ford Motor Company asking for all pertinent information relating to the information supplied by Mr. Copp. Ford Motor Company answered the NHTSA request on June 28, 1971, with a follow-up on July 29, 1972, and supplied test reports and other relevant information including a film entitled, "1960 Falcon-Corvair Handling Comparison."

A detailed examination was made by NHTSA of the film in conjunction with the analysis made by Mr. Copp. This was initiated prior to the public release of this information by Mr. Ralph Nader:

The NHTSA analysis of the film is as follows:

> A special projector was used in this analysis which had a frame counter with variable speed in forward and reverse motion. Each frame could be reviewed one at a time or in other desired sequences. A stop watch was also used

while analyzing the film to assist in establishing the speed of the vehicles. A layout of the test facility where the "Comparison" was performed was obtained from Ford Motor Company. (See Illustration No. 9.) This layout was used to assist in establishing the paths of the vehicles and in calculating the vehicle's speed.

The test was conducted so that the Falcon was always the lead car when the two cars were driven in the same scene. It was the conclusion of the analysts that this gave the Falcon a distinct advantage in the driving maneuvers on the test track.

There was no apparent instrumentation or inside cameras used, therefore, the drivers could not be monitored in their steering, throttle, or brake activities. The drivers did not use any visible crash helmets or other safety equipment; apparently rollovers or accidents of this nature were not anticipated.

There were skid marks and dirt on the track at several points, where the driver ultimately left the road, which were there prior to the filming. This indicated that some practice runs may have been performed before the filming.

RIDE AND HANDLING ROADS

LANE	LEGEND
1	SHAKE ROAD -- BROKEN AND PATCHED CONCRETE – WHEEL RIGHT CURVE
2	TRANSVERSE TAR STRIPS – STREETCAR TRACKS
3	CHUCK HOLES – WASHBOARD ROADS – DISPLACED SLABS
4 & 5	PITCH, TWIST AND SHAKE ROADS AND SQUARE-EDGED POTHOLES
6 & 7	RAILROAD CROSSING – CROWNED STREET INTERSECTION – ADJUSTABLE RAMP AND REFERENCE LANE
8	HIGH CROWN ROAD – ENTRANCE TO HANDLING ROAD

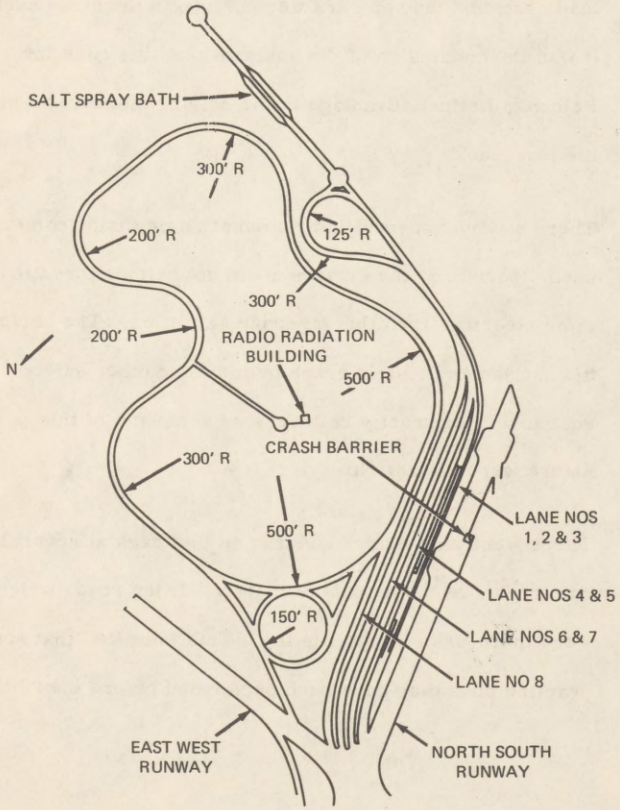


ILLUSTRATION NO. 9

Only on a few occasions could the driver's steering actions be seen. Also there was no indication of the physical condition of the vehicles.

It was interesting to note that the driver generally got the car to skid in about the same location, at a point where he was in front of the camera. The driver also got the Corvair to go straight off the circular test track both forward and backward in the same spot.

Test Entitled Phase I, Comparative Breakaway Tests

Test No. 1, Manufacturer's Recommended Pressures

During this phase the vehicles traveled in the outside of the outer lane of the circular track which had a center radius of 150 feet. The lanes were 12 foot wide and the center of the outside lane had 156 foot radius. Therefore, the center of the vehicles were on a 156-plus foot radius path. (See Illustration No. 10.)

At the start of Phase I, Test No. 1, the vehicles made about one and one-half revolutions of the circular track. The number of frames for a complete revolution were determined. A stop watch was used to measure the time it took to make one revolution. The point where this is done is shown in Illustration No. 11. The average speed for the complete lap was calculated to be 35 mph., using 156 feet as the radius of travel on the circular track the lateral acceleration was calculated to be 0.52g. The calculations are considerably higher than the values of 30 mph. and 0.4g given by Mr. Copp.

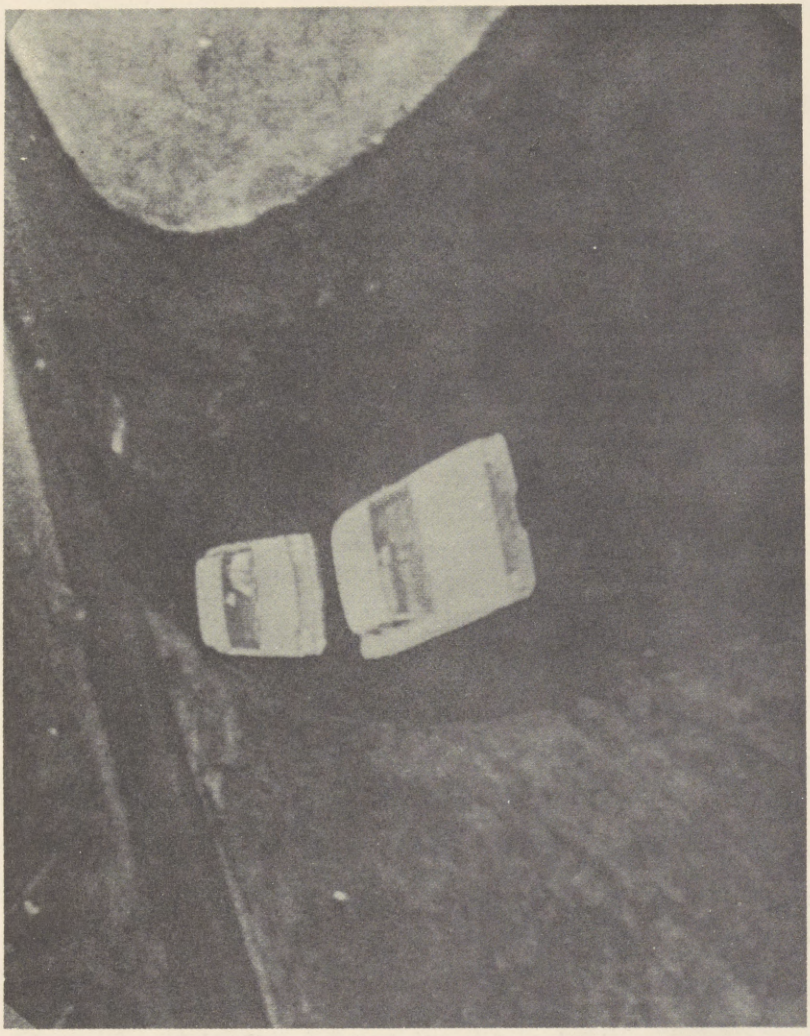


Illustration No. 10
Path of Vehicles in Outside Lane of Circular Test Track

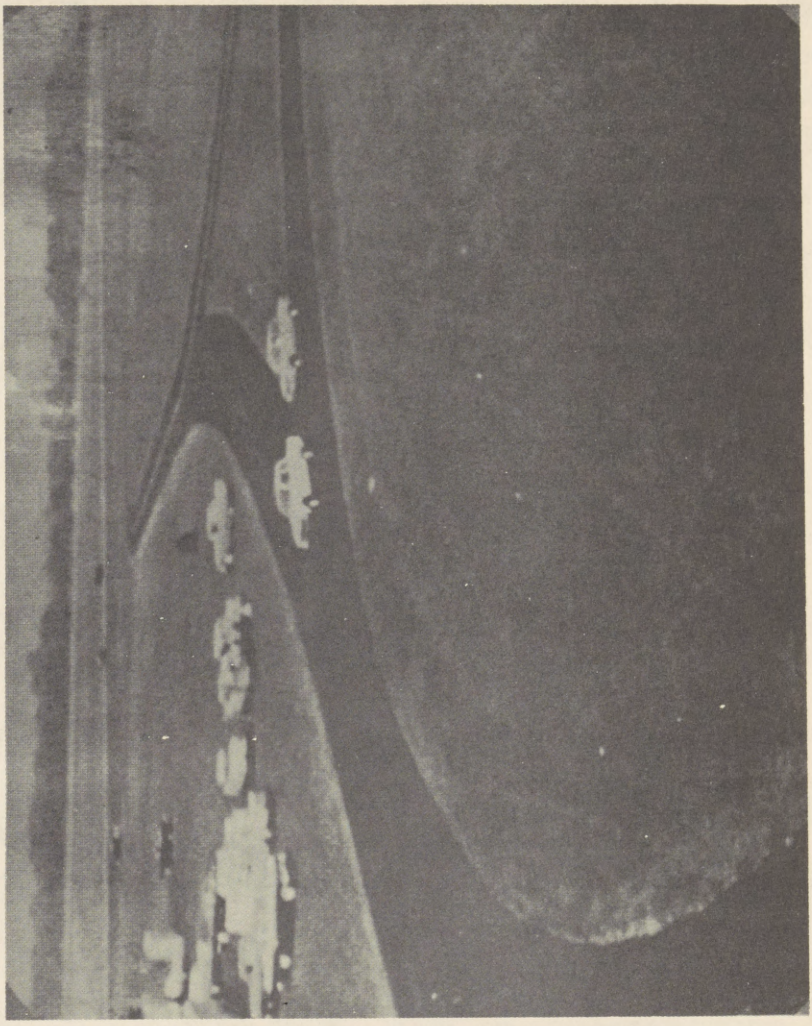


Illustration No. 11
Circular Test Track Reference Point for Speed and
Lateral Acceleration Calculations

Since there were no cameras or other data recording instruments inside the car to monitor the actions of the operator as he was driving the vehicle, it was difficult to establish the reasons for the car's reactions. Because of the driver's obvious steering wheel movements which seemed to induce vehicle reactions which can be seen in Phase II section of the film, the driver's actions appear inappropriate.

For Phase I, Test No. 2 of the "Comparative Breakaway Tests," with the Falcon tires inflated to the manufacturer's recommended pressures and the Corvair tires inflated to non-recommended pressure of 26 psi front and rear, the speeds and lateral acceleration were calculated. Again the vehicles were on the outer lane of the test track. Using the same reference point as in Test No. 1, counting the frames for one complete revolution and recording the time, the average speed was calculated to be approximately 37 mph. and the lateral acceleration to be 0. 57g. This is also much higher than the 30 mph. and 0. 4g quoted by Mr. Copp. As in Phase I, Test 1 of the film no cameras or recording instruments were in the car to monitor the driver's actions and the reasons for the vehicle's ultimate maneuver could not be determined.

A point to note is that Mr. Copp rated the Corvair higher with the non-recommended 26 psi front and rear tire pressures than with the manufacturer's recommended tire pressures used in Test No. 1 which were inconsistent with his analysis.

Test Entitled Phase II, Highway Cornering Test

The NHTSA also calculated the approximate speed and lateral acceleration for the Phase II - Highway Cornering Test which took place on an "S" curve. Each curve section was an arc of approximately 140° with a 200 foot radius connected by a straight section of 100 feet in between the arcs and 82 foot straight section at the end, according to the Ford information.

During Phase II, Test No. 1 the manufacturer's recommended tire pressures were used by both vehicles - Falcon 24 psi front and rear, Corvair 15 psi front and 26 psi rear. The speed and lateral acceleration of the vehicles during this portion of the film were more difficult to estimate. However, near the end of the second turn as the vehicles passed in front of the camera the speed and lateral acceleration were estimated, with the aid of the frame counter, to be about 38 mph. and 0.5g respectively. Here again the values are higher than those calculated by Mr. Copp.

In all the scenes the vehicles negotiate the first of the two curves with no difficulty. As the vehicles come to the end of the second curve with no apparent problems the driver of the Corvair can clearly be seen turning the steering wheel to the inside of the radius of the curve, for no logical reason, just as the vehicle passes the camera. At this point in time the vehicle starts to skid. (See Illustration Nos. 12, 13, and 14.) The driver of the Corvair can be seen making similar steering inputs in the runs of Phase II, Test No. 1.

Phase II, Test No. 2, is conducted with the Falcon tires inflated to recommended pressures of 24 psi front and rear. The Corvair is run with non-recommended pressures of 26 psi front and rear.

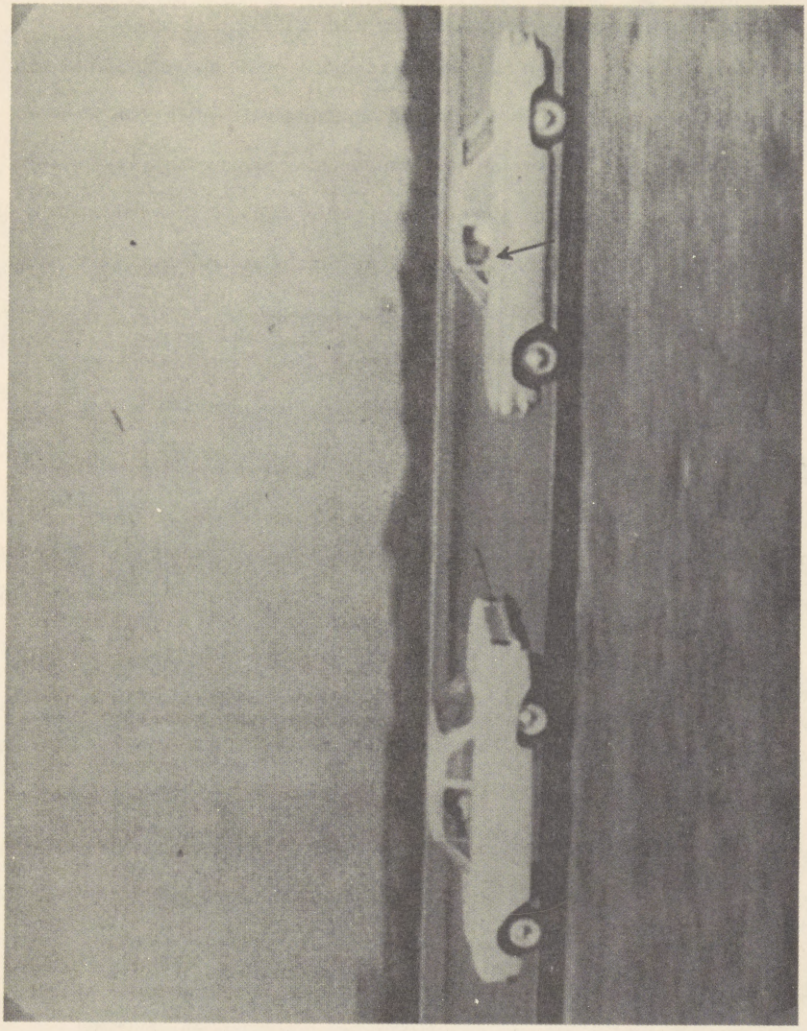


Illustration No. 12
Vehicle under Control--Near End of Second Curve

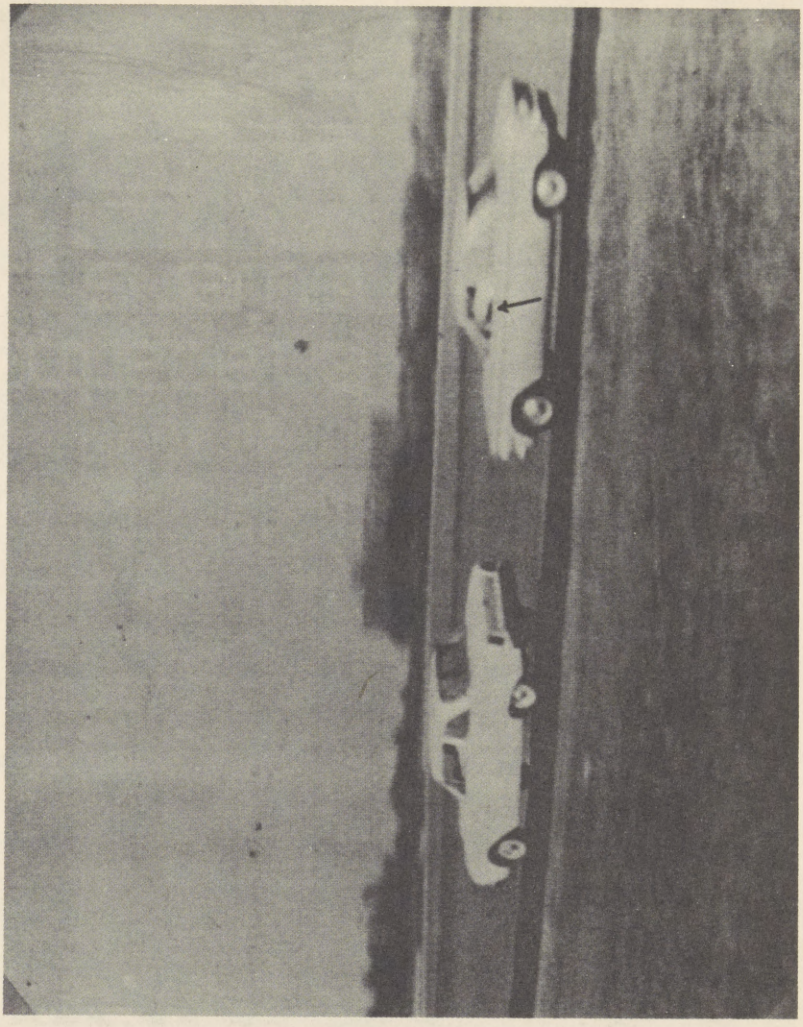


Illustration No. 13
Driver Giving Additional Steering Input--Near End of Second Curve

85-820 O - 73 - 18

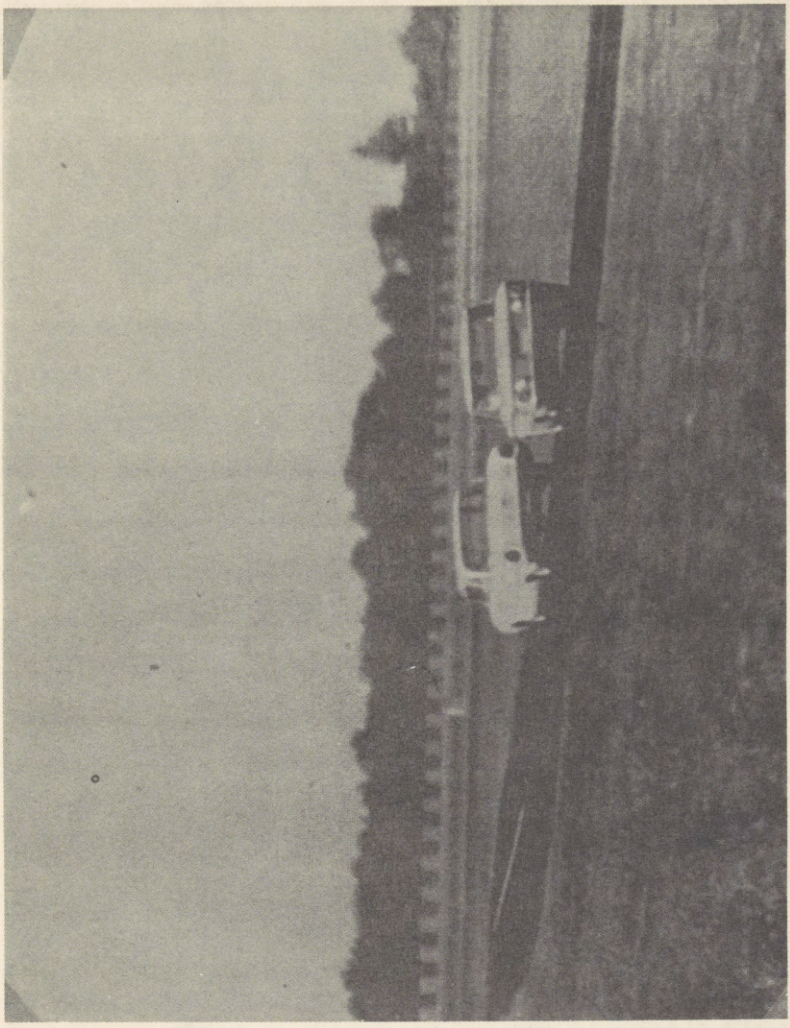


Illustration No. 14
Vehicle Responding to Additional Steering Input--End of Second Curve

This series starts out with the Corvair doing a solo run. The driver takes the first curve without any difficulty. As he comes into the second curve he is either going too fast, or he gives the vehicle too much steering input which causes it to spin off the road on the inside. It was noted that the driver was not wearing a crash helmet, so he must not have been concerned about overturning. It should be noted that the same results could have been obtained with the factory recommended tire pressures by driving at similar speeds and steering the vehicle in a like manner.

The second scene of this section of film is similar to Phase II, Test No. 1, with the Corvair following the Falcon around the first curve, then as they go around the second curve the driver of the Corvair appears to take the curve further to the outside and then turn it sharper to get behind the Falcon. This causes him to almost go off the road on the inside. In correcting for this, the back end of the vehicle slides and the driver then goes off the road on the left side.

The last scene of this series starts with the Corvair at a considerable distance behind the Falcon. By the end of the first 200 foot radius curve the Corvair had caught up with the Falcon. The driver of the Corvair again appears to take the second 200 foot radius curve further to the outside and as he comes past the camera he can be seen putting in a little extra steering and the Corvair is then driven off the curve on the inside.

It was noted that the drivers of the Corvair and Falcon always made it around the first curve without any difficulty. It was not until the Corvair almost completed the second 200 foot radius curve and was in front of the camera that for no apparent reason the driver appeared to make an unnecessary steering input which caused the vehicle to skid off the road.

Mr. Copp's implication that the limit of control of the 1960-1963 Corvair is about 0.4g is not consistent with the NHTSA calculation from the Ford film. It also does not agree with other data provided by Dr. Manos, the Ford Motor Company, or statements which were presented and accepted by representatives of all the major automotive manufacturers during the 1966 Michigan State Senate Hearing, nor the NHTSA testing. All these sources concur that the limit of control of the 1960-1963 Corvair as being about 0.6g sustained lateral acceleration.

It is concluded that the film and Mr. Copps' analysis is not a valid evaluation of the handling characteristics of a 1960 Corvair.

C. Input-Response Test Program

1. Purpose

The purpose of this test program was to compare the handling and stability characteristics of the 1960-1963 Corvair with selected small passenger cars manufactured between 1960 and 1967.

2. Scope

The scope of this test program was to carry out comparative Input-Response tests involving five separate maneuvers on all of the selected vehicles.

3. Background

When the decision to conduct handling and stability tests was made by the National Highway Traffic Safety Administration, one of the requirements was that NHTSA personnel would conduct the tests, with technical support from an independent research agency. The Texas Transportation Institute (TTI), Texas A&M Research Foundation, was selected as the prime contractor.

There are basically two types of tests for vehicle handling performance: (a) Input-Response and (b) Task Performance. Of these two, Input-Response was selected by NHTSA for comparative tests.

As the primary developer of the Input-Response testing methods, the Highway Safety Research Institute (HSRI) of the University of Michigan (U of M) was contacted and consulted during the intial phases of this

program. The vehicle handling test procedures employed in this program were defined by NHTSA although they were closely related to methods previously developed and used at the HSRI.

Five tests were chosen with the intent of providing a basis for comparing the handling characteristics of the six vehicles included in the program. These vehicles were a 1962 Falcon, 1962 Volkswagen, 1963 Corvair, 1963 Renault, 1960 Valiant, and a 1967 Corvair.

The tests were designed to incorporate steering maneuvers, steering plus braking maneuvers, and steering maneuvers on a rough surface. These are briefly described as follows:

Steady Turn Braking, Smooth Road

This test consisted of braking the vehicle which was in a steady-state turn of 0.3 g's (lateral to vehicle) at 30 mph. Successive runs were made modifying the brake line pressure as necessary so that conditions from impending one wheel lock-up (no wheels locked), one wheel, two wheel, three wheel and four wheel lock-up were achieved, if possible. The type of maneuver in this test simulates the maneuver required in an emergency situation in which a vehicle being driven through a curve must be brought to to a stop with little or no deviation from its intended path. The purpose of this test was to determine vehicle path deviation from a nominal circular trajectory, as the level of deceleration was increased toward its limit value.

Steady Turn, Rough Road

In this test the vehicle was stabilized in a 0. 3g steady-state turn at 30 mph, before encountering a series of bumps. Three types of bumps were laid out with 30 mph designed frequencies of 9, 11, and 14 Hertz, which approximated the natural range of frequencies of the suspension systems of the vehicles being used in the tests. This test simulated a vehicle cornering at fairly high lateral acceleration and encountering a series of bumps or other unexpected road obstructions in the road.

Step Steer

This test consisted of suddenly applying a steering input to a vehicle traveling in a straight line at 30 mph The test was repeated with progressively increased steering inputs to the point of maximum input.

This maneuver represents a "J" turn.

Reverse Steer Input

In this maneuver the vehicle was put in a 40 mph steady-state turn at 0. 3g and at 0. 4g followed by a sudden steering input applied in the opposite direction. The test was repeated with progressively larger reverse steering inputs to the point of maximum steering wheel displacement (lock). This maneuver represents a modified "J" turn.

Drastic Steer, Drastic Brake

This test utilized a first generation automatic controller (developed by HSRI) in lieu of a driver. The performance of the maneuver depended on the critical timing of events based on measured response parameters as well as on programmed inputs of such a nature that they could not be provided by a driver. The sequence of inputs was that which HSRI concluded was most apt to place a vehicle in a rollover mode Vehicle speeds from 40 mph through 60 mph in increments of 10 mph were used except when limited by the top speed of the vehicle. Runs at 30 mph were also made if outrigger contact occurred at 40 mph to determine if contact would be made at that lower speed. With the vehicle proceeding on a straight path at a predetermined speed, the throttle was released simultaneously with the application of a half-sine steering input of predetermined amplitude increasing up to 400 degrees which was the limit of the control equipment. The duration of the input was one second.

A brake input sufficient to cause lock-up of all wheels was introduced at a point in time when the vehicle's yaw rate response was approximately at its peak. After 0.5 seconds maximum four wheel lock-up, the brakes were released. By varying the magnitude and timing of inputs described above, an effort was made to induce rollover in each vehicle tested.

4. Vehicles and Facilities

The vehicles used in the test program were given a comprehensive inspection and repaired to bring them up to an acceptable level of mechanical condition and safety. Each vehicle was brought up to the manufacturer's specifications in accordance with its individual service manuals. The replacement and spare parts used were the original manufacturer's supply and were obtained through the local dealers, with the exception of the Renault parts. There was no local Renault dealer, and necessary parts, in this case, were obtained through a regional warehouse. The tires used in the test program were as close to the original O. E. M. specifications (size, manufacturer, tread design, and materials) as possible. The correct tire sizes in the present-day line and materials were found for all the cars except the Renault. A source for the 5.00 x 15 or 5.10 x 15 tires for the Renault was not found by the time testing of the Renault was to start; therefore, it was necessary to use 5.60 x 15 tires on the Renault, which were available.

After each vehicle had been mechanically prepared and instrumented, weight was added so that each wheel was loaded statically to match the manufacturer's maximum recommended weight with passengers and luggage. The fifth wheel, used to measure vehicle speed, was in the down position for each measurement of vehicle weight.

Vehicle wheel alignment was adjusted to the manufacturer's recommendations at curb weight after the mechanical preparation. In each case, wheel alignment was again measured in the fully loaded condition

and "base line" measurements were determined for this condition. Alignment then was checked and reset as necessary to the "base line" values throughout the testing of each vehicle.

The outrigger pad heights were set to represent a "rollover" if they made contact with the roadway surface during a maneuver. Vehicle brakes were burnished following the S.A.E. Recommended Practice J843C.

The tires used in the program were all given a 200 mile break-in prior to being used for testing. The tread depth was measured and recorded after the break-in. The tire pressures were set to the vehicle manufacturer's recommendations (cold) for all tests except one -- Steady Turn, Rough Road. (This exception will be explained later in the report.)

Tires were replaced when, or before, any point was worn to 80% of the "after break-in" average tread depth (20% maximum wear). Several of the test maneuvers produced severe tire sidewall wear. Constant monitoring of the sidewalls was required, in addition to monitoring of the tread depth, to assure that test data were not biased by worn tires.

The road surface grade of the test areas was level within 1%. The average skid number for the road surface was 79 at 30 mph and 80 at 60 mph. The ambient temperatures and wind velocity were monitored during testing with portable on-site equipment.

5. Comparison of Test Data

Steady Turn Braking, Smooth Road

The values of the "Average Maximum Yaw Rate Deviation" (Δr) and "Heading Angle Deviation" ($\Delta\psi$) versus the number of wheels locked were two of the four plots* generated for this particular maneuver These plots also contain the "Average Longitudinal Deceleration" ($\Delta\bar{A}x$) and are presented as one of the vehicle comparisons. Although various combinations of wheel lock-up or impending wheel lock-up were tried during the tests, it was not possible to achieve the same condition of wheel lock-up or impending wheel lock-up in every vehicle because of braking system differences.

The condition of impending one wheel lock-up (No wheels locked) was viewed as being most representative of "real life" and was attainable in all but the 1967 Corvair. The safety feature of the dual system master cylinder of the 1967 Corvair, when combined with the pressure modulator system used for pressure control, caused minimum of two wheels to lock in this vehicle.

The "Average Maximum Yaw Rate Deviation" and the "Average Longitudinal Deceleration" for impending one wheel lock-up

---

*The other two plots were Maximum Yaw Rate Deviation" (Δr) versus "Average Longitudinal Deceleration ($\bar{A}x$) and "Heading Angle Deviation ($\Delta\psi$) versus $\bar{A}x$.

in the 1963 Corvair fell between the values for the Falcon and Valiant. (See Illustration No. 15) The "Average Heading Angle Deviation" for the 1963 Corvair and Valiant were nearly the same, with the Falcon closer to the Zero Deviation Line. All three of these vehicles were on the "Spin" side of the Zero Deviation Line. (See Illustration No. 16)

The Volkswagen and the Renault had about the same "Average Heading Angle Deviation" and "Average Maximum Yaw Rate Deviation" but they were on the "plow" side of the Zero Deviation Line.* The "Average Longitudinal Deceleration" of the 1963 Corvair was between the Volkswagen and the Valiant values and the Renault and Falcon values.

The "Average Maximum Yaw Rate Deviation" and "Average Heading Angle Deviation" plots with the four wheel lock-up condition resulted in the 1963 Corvair being between the Falcon and the Valiant. The values for the Volkswagen and the 1967 Corvair were less than the three aforementioned vehicles, with

---

*The terms "spin" and "plow", as used throughout this report, only indicate the mode in which body side slip occurs, and they do not suggest loss of control of the automobile. "Spin" simply describes a situation in which side forces have probably saturated on both rear tires during a turning maneuver, causing an increase in yaw rate. Conversely, "plow" indicates a probable saturation of side forces on both front tires, causing a decrease in yaw rate.

STEADY TURN BRAKING, SMOOTH ROAD

IMPENDING ONE WHEEL LOCKUP WITH NO WHEELS LOCKED (Right Turn)

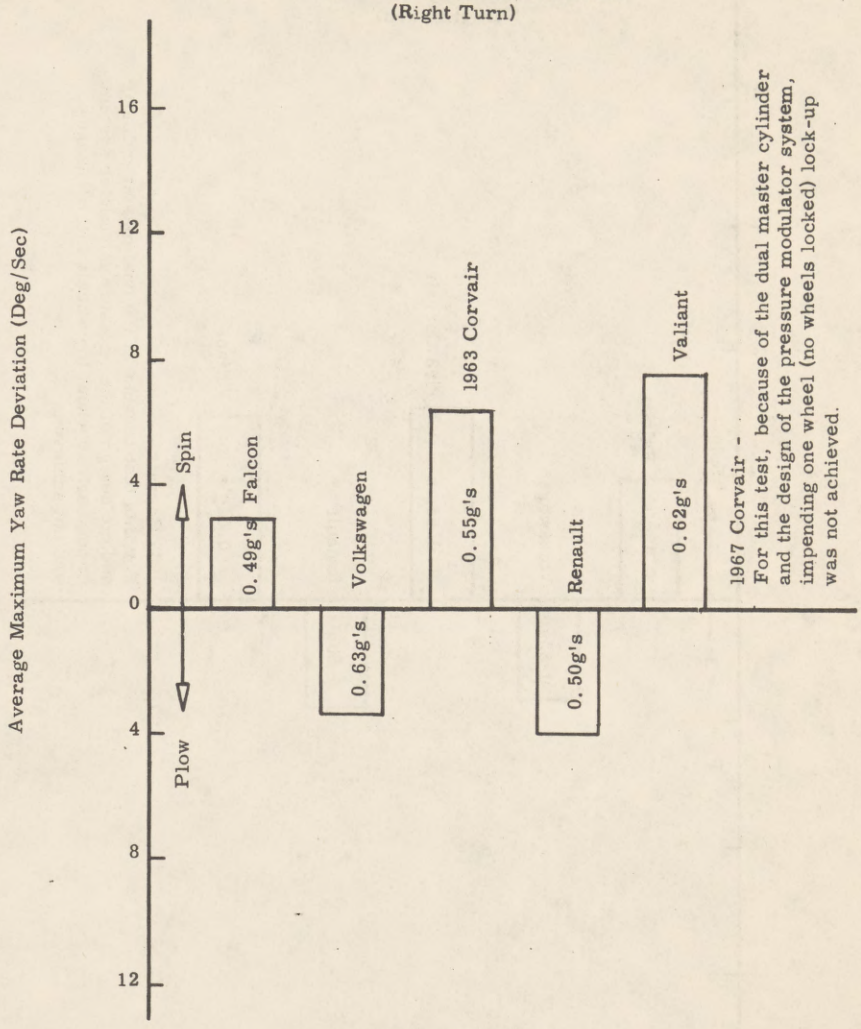


Illustration No. 15

STEADY TURN BRAKING, SMOOTH ROAD

IMPENDING ONE WHEEL LOCKUP
WITH NO WHEELS LOCKED
(Right Turn)

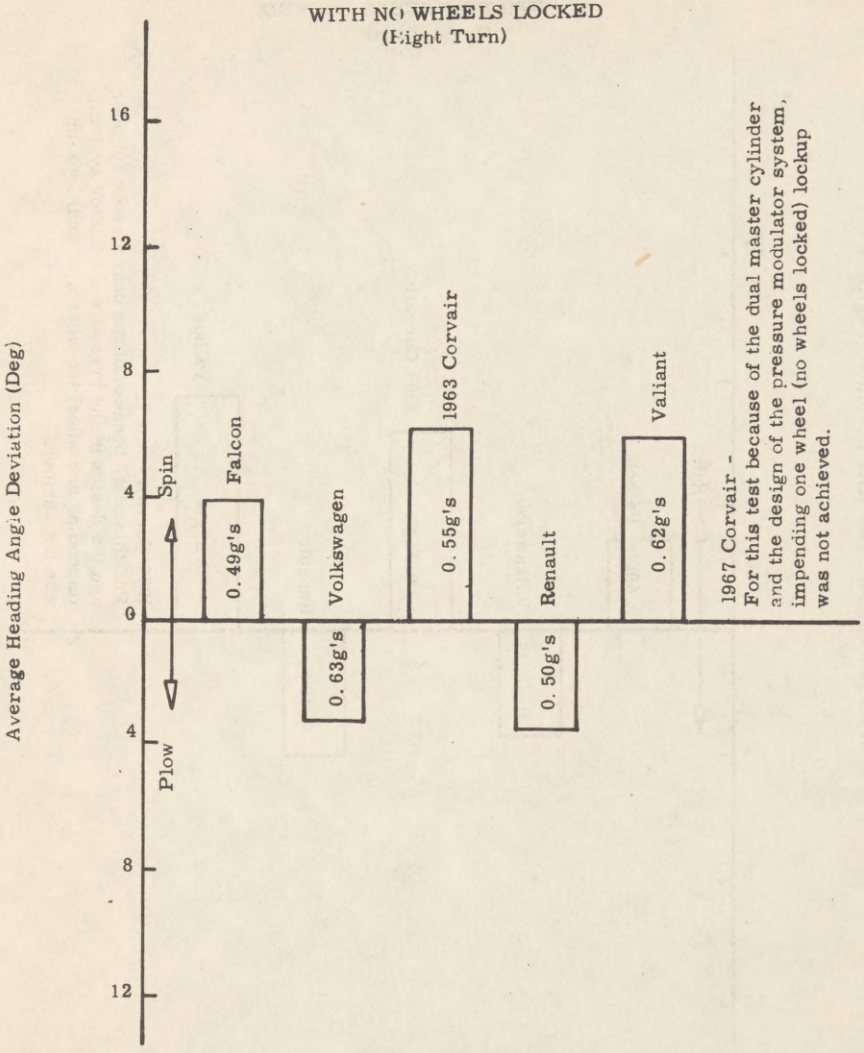


Illustration No. 16

the 1967 Corvair having the lowest deviations. (See Illustration Nos. 17, 18) In this maneuver, the Renault could not be evaluated because of the design of the brakes not permitting rear wheel lockup.

STEADY TURN BRAKING - SMOOTH ROAD

Four Wheel Lock-up
(Right Turn)

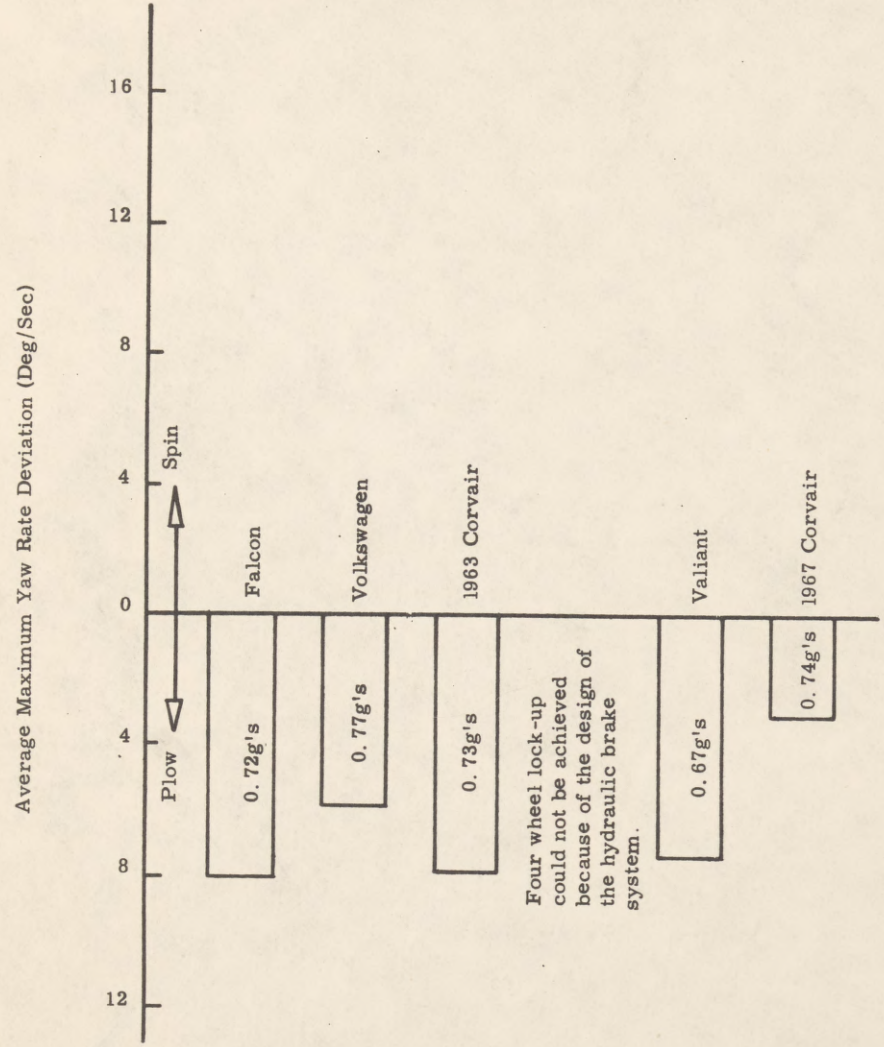


Illustration No. 17

STEADY TURN BRAKING - SMOOTH ROAD

Four Wheel Lock-Up
(Right Turn)

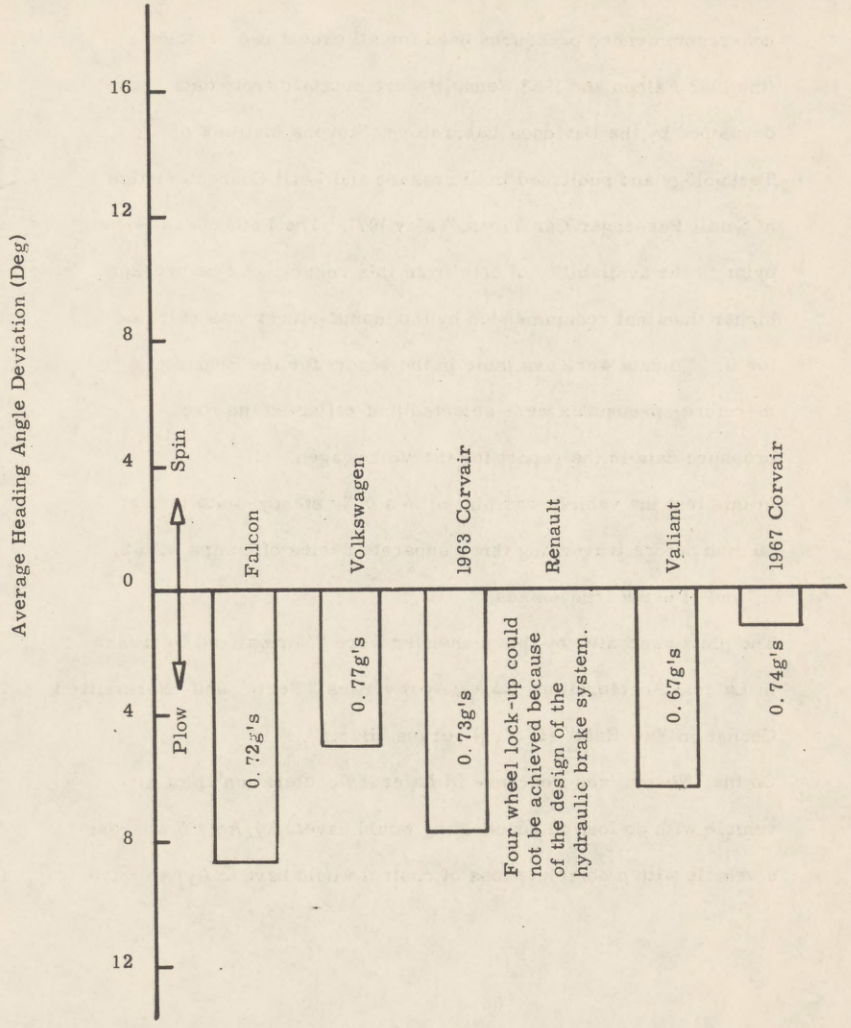


Illustration No. 18

65

Steady Turn, Rough Road

This test was conducted at two tire pressures--the manufacturer's recommended pressures and non-recommended pressures. The non-recommended pressures used for all except two vehicles (the 1962 Falcon and 1963 Renault) were obtained from data developed by the Davidson Laboratory, Stevens Institute of Technology and published in "Pressure and Load Characteristics of Small Passenger Car Tires," May 1971. The Falcon was tested prior to the availability of data from this report. A tire pressure higher than that recommended by the manufacturer was selected for it. No data were available in the report for the Renault; therefore, pressures were selected that reflected the tire pressure data in the report for the Volkswagen.

In this test the vehicle was placed in a 0.3g steady-state turn at 30 mph before traversing three separate series of bumps with 9, 11, and 14 hertz frequencies.

The plots generated by this maneuver were "Normalized Decrease in Lateral Acceleration" ($\Delta Ay/Ayo$) versus "Hertz" and "Normalized Change in Yaw Rate" ($\Delta r/r_o$) versus "Hertz".

On the "Normalized Decrease in Lateral Acceleration" plot a vehicle with no loss in roadholding would have $\Delta Ay/Ao = 0$, whereas a vehicle with a complete loss of control would have $\Delta Ay/Ao = 1.0$.

The "Normalized Decrease in Lateral Acceleration: plot of the series conducted at the manufacturer's recommended tire pressure resulted in the 1963 Corvair having the lowest value (close to zero) for both the 9 and 11 hertz bumps. The Volkswagen and the 1963 Corvair were lowest for the 14 hertz bumps. (See Illustration No. 19) The same series conducted at the non-recommended pressures showed the 1963 Corvair with the lowest value at 9 hertz At 11 hertz the 1963 Corvair was in the middle with the Falcon and Renault above it, the Volkswagen and Valiant below it and the 1967 Corvair was about the same as the 1963 Corvair. At 14 hertz the 1963 Corvair had the highest value. (See Illustration No. 20)

The "Normalized Change in Yaw Rate" was plotted so that the resulting value of $(\Delta r/r_o)$ was plotted as a positive quantity for Δr greater than r_o and as a negative quantity for Δr less than r_o.

The "Normalized Change in Yaw Rate" plot of the initial vehicle responses for the series conducted at the manufacturer's recommended pressures showed the 1963 Corvair having the lowest values (closest to Zero) for 9, 11, and 14 hertz (See Illustration No. 21) The same plot for the series conducted at the non-recommended pressures showed the 1963 Corvair with the lowest

STEADY TURN - ROUGH ROAD

(WITH MANUFACTURER'S RECOMMENDED TIRE PRESSURES)

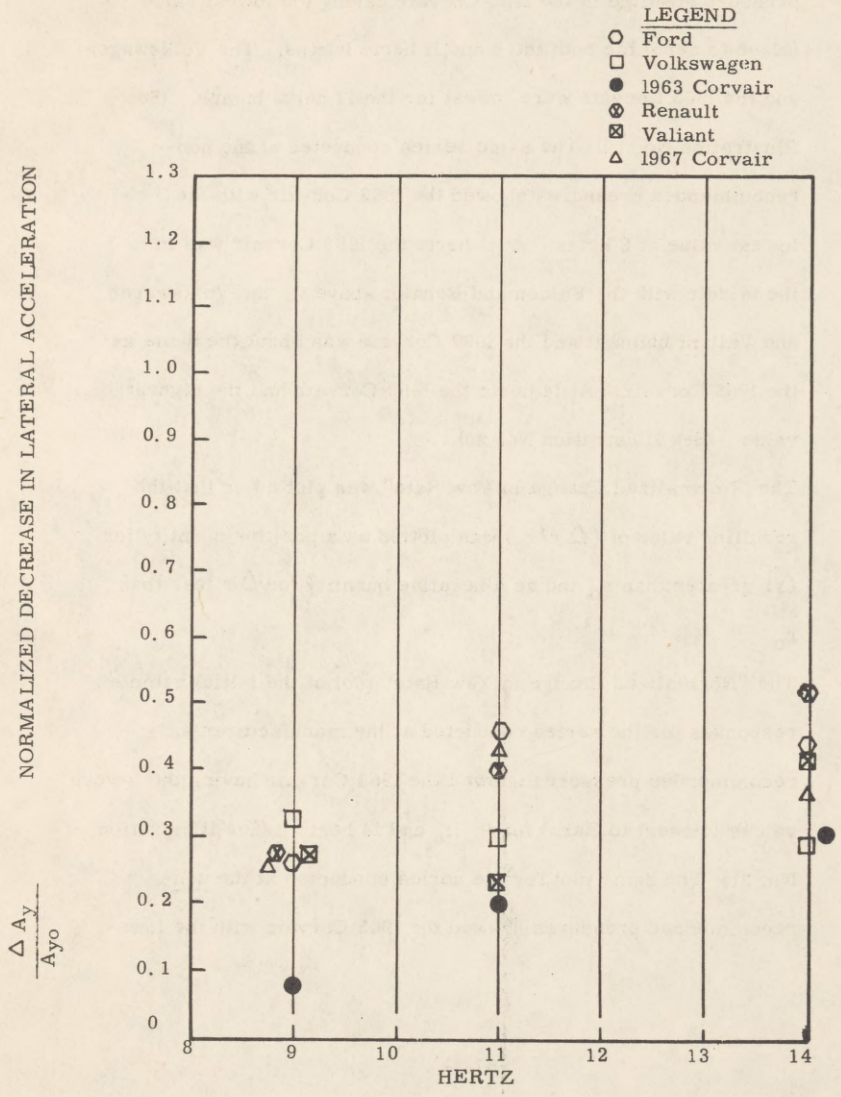


Illustration No. 19

STEADY TURN - ROUGH ROAD

(WITH NON-RECOMMENDED TIRE PRESSURES)

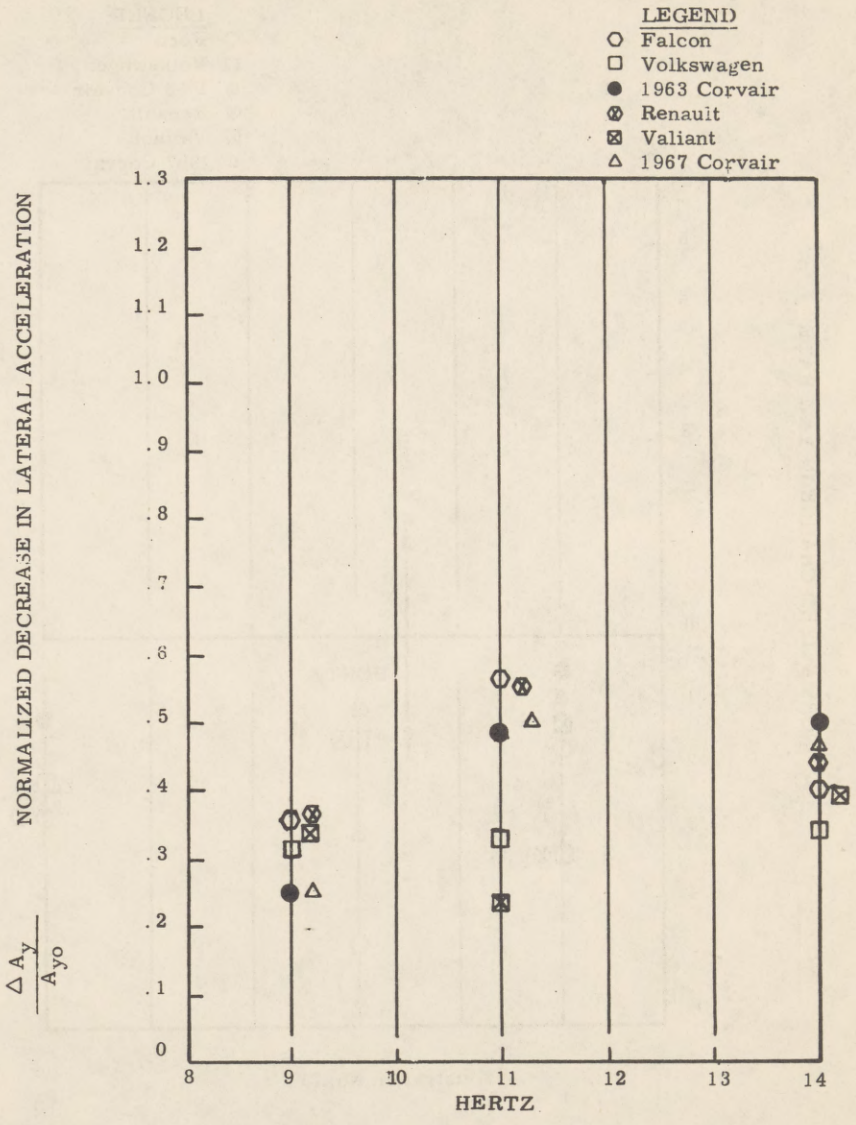


Illustration No. 20

STEADY TURN - ROUGH ROAD
INITIAL RESPONSE
(WITH MANUFACTURERS RECOMMENDED TIRE PRESSURES)

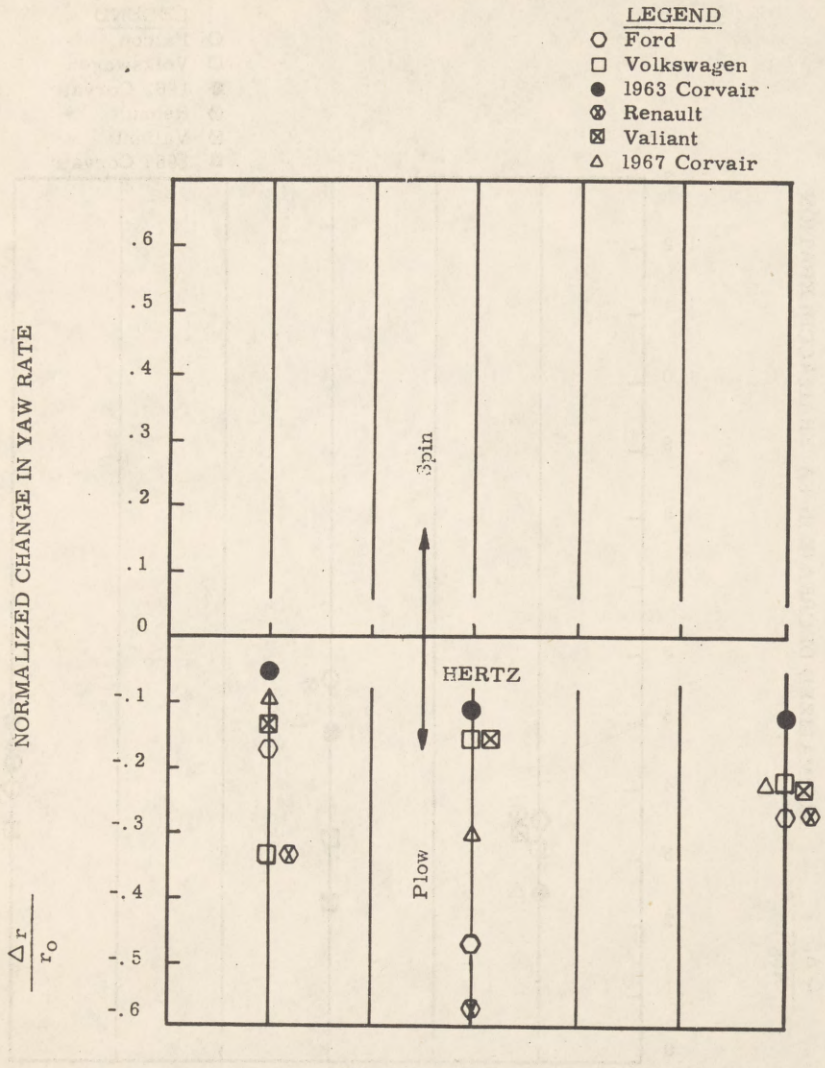


Illustration No. 21

value (closest to zero) for the 9 hertz bumps. It (1963 Corvair) was about the same as the Valiant and Volkswagen, which were the lowest (closest to zero) for the 11 hertz bumps and about the same as the Volkswagen, which was the lowest (closest to zero) for the 14 hertz bumps. (See Illustration No. 22)



STEADY TURN - ROUGH ROAD
INITIAL RESPONSE
(WITH NON-RECOMMENDED TIRE PRESSURES)

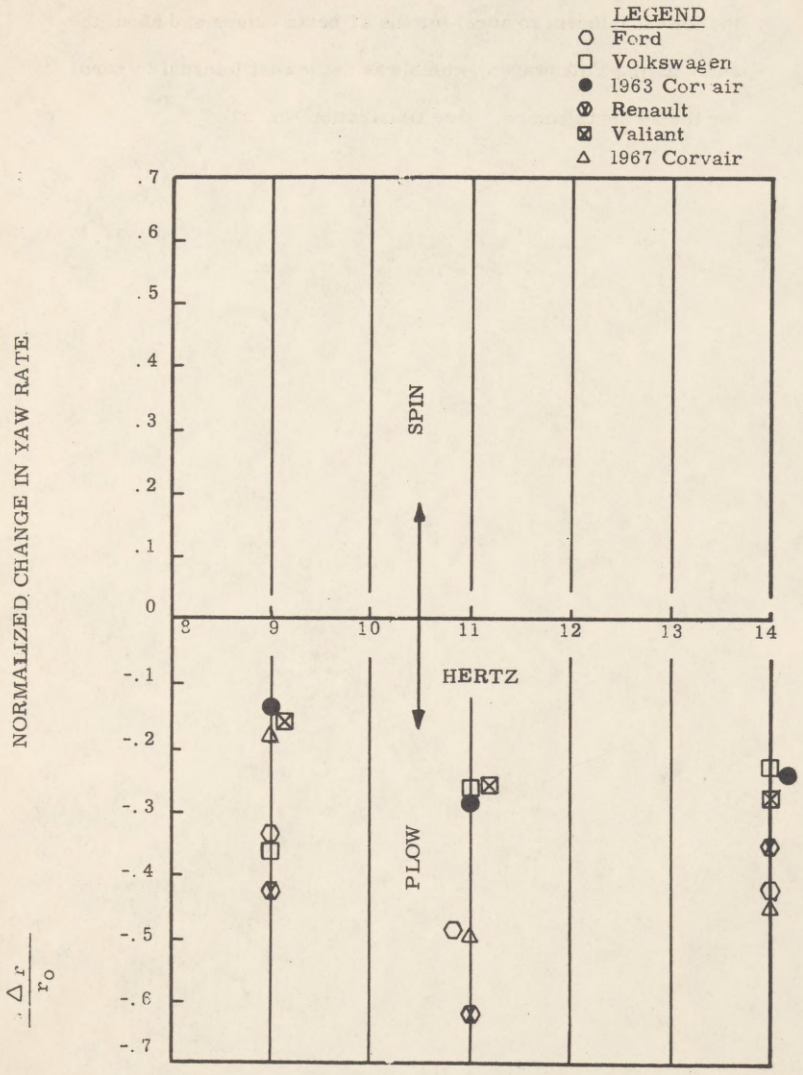


Illustration No. 22

Step Steer

This test had no initial steady state turn, but began with the vehicle achieving a steady velocity of 30 mph straight ahead, at which time a predetermined steering input was suddenly applied and held constant. This maneuver represented a "J" turn. The vehicles were subjected to incremental increases in steering input up to and including the maximum steering wheel displacement.

Lateral acceleration (Ay), Yaw rate (r) and Velocity (V) were all recorded during this maneuver. When the vehicle held the path perfectly, i.e., no body side slip and no time lag between steering input and response for any given run, the values of Ay, V and r at any particular time during the maneuver obeyed the relationship, Ay = rV. Therefore, the data were plotted as "Peak Lateral Acceleration" (Ayp) versus the "Yaw Rate, Velocity Product (r'pV'p), where both r'p and V'p corresponded in time to the occurrence of Ayp.

Superimposed on this plot is the "no side slip" or "perfect path holding" line described by the equation Ay = rV. A data point falling to the right of the "no side slip" line suggests that the vehicle was losing its path in a "spin" mode, a data point to the left is an apparent "plow" situation, and a point near or on the line is considered to be ideal. In addition, a line is drawn across

the plot at 0.6g lateral acceleration. This line represents the approximate "Limit of Control" for the vehicles tested, except for the 1967 Corvair which has a higher limit of control of about 0.7g. Maneuvers that generate lateral acceleration greater than the "limit" value generally would result in the vehicle being uncontrollable. Therefore, values above the 0.6g "limit of control line" would generally be in the uncontrollable area except in the case of the 1967 Corvair.

The 1963 Corvair data points fell very close to the "no slip line" throughout the vehicle's controllable range and compared favorably with the plots for the other vehicles tested. (See Illustration No. 23)

In addition to the above, a plot of "Peak Lateral Acceleration" versus "Steering Wheel Angle" (δ sw) was developed.

The data points for the 1963 Corvair for this Plot fell between the Falcon, Valiant, and 1967 Corvair on one side, and the Volkswagen and Renault on the other side. (See Illustration No. 24)

The "Peak Lateral Acceleration" versus "Steering Wheel Angle" plot was also "normalized" to neutralize the effect of the differences in steering ratio for the cars tested. Up to the "Limit of Control", all the plotted lines for the vehicles fell in a tight band. (See Illustration No. 25) Beyond the limit of

STEP STEER

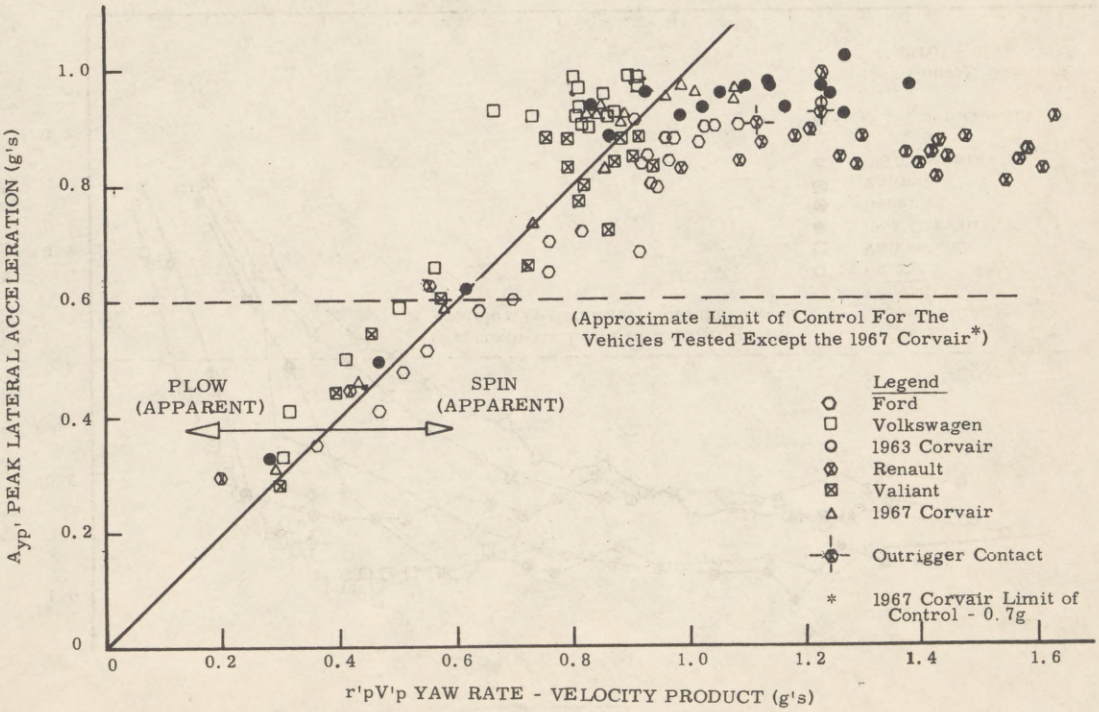


Illustration No. 23

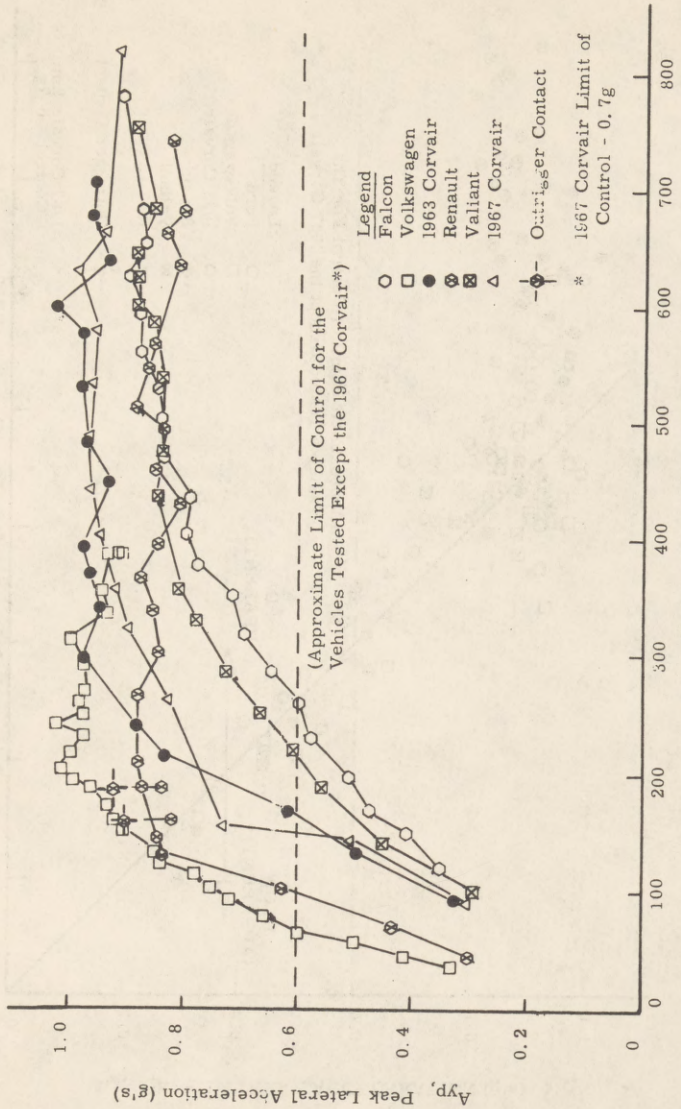


Illustration No. 24

STEP STEER

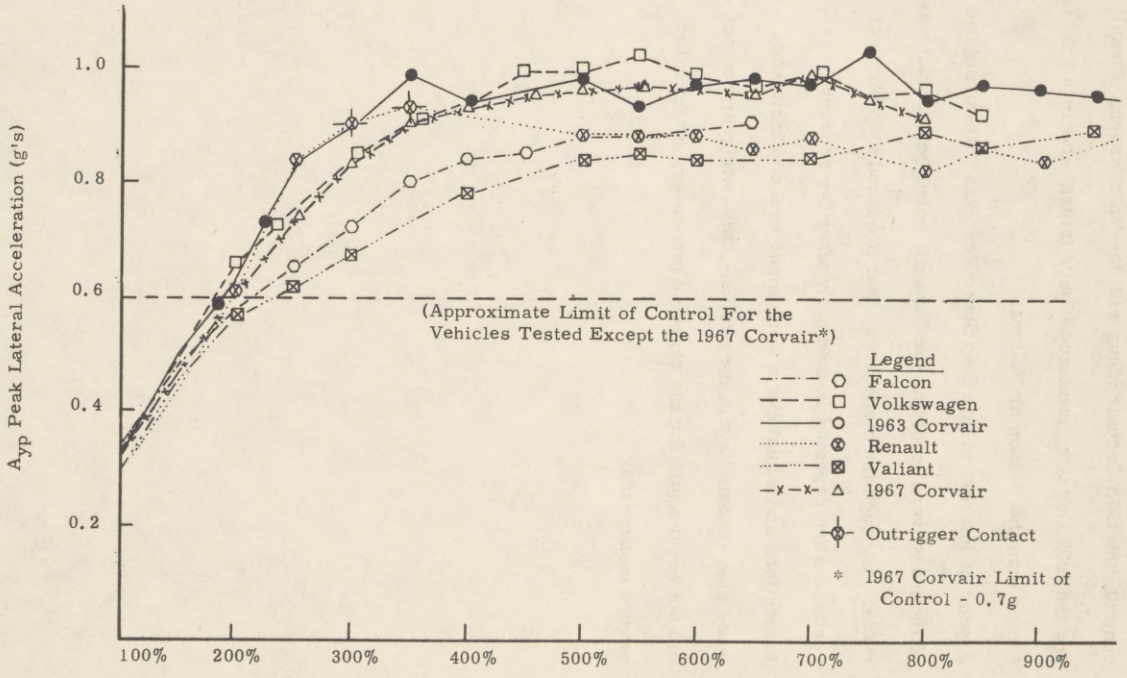


Illustration No. 25

control, the 1963 Corvair along with the Volkswagen, Renault and the 1967 Corvair, produced higher lateral acceleration "G" forces than the Falcon or Valiant.

A point of interest in this Step Steer Test was that during two of the maneuvers involving the Renault, outrigger contact was made. Although the maneuvers that produced the outrigger contacts were repeated immediately after the necessary inspections and adjustments were made to the vehicle and were also repeated again the next day, the outrigger contact did not occur again for the repeated maneuvers or for more severe maneuvers.

Reverse Steer

This test was conducted at 40 mph. After attaining a velocity of 40 mph, the steering wheel was turned against a preset stop so that the vehicle would achieve a steady-state turn. The magnitude of the input steer was adjusted to obtain a constant lateral acceleration of 0.3 g's for one test condition and 0.4 g's for another. After several seconds in the steady-state condition, the steering wheel of the vehicle was rapidly turned in the opposite direction against a second preset stop. This maneuver represented a modified "J" turn. The single input variable in this test was the magnitude of the reverse steer.

The plots generated for this maneuver were "Peak Lateral Acceleration" (Ayp) versus "Yaw Rate Velocity Product" (r'p V'p) and "Peak Lateral Acceleration" versus "Reverse Steer Input" (δsw) for both the 0.3g and 0.4g steady-state conditions. In addition, the "Peak Lateral Acceleration" versus "Steering Wheel Angle" plot were "normalized" to neutralize the effects of the different steering ratios.

On the "Peak Lateral Acceleration" versus "Yaw Rate-Velocity Product" plot for the 0.3g condition the two points of the 1963 Corvair that were near or below the Limit of Control fell right on the "no side slip line". (See Illustration No. 26) On the "Peak Lateral Acceleration" versus "Reverse Steer Input" plot,

REVERSE STEER

Initial Left Turn Stabilized Input - 0.3g

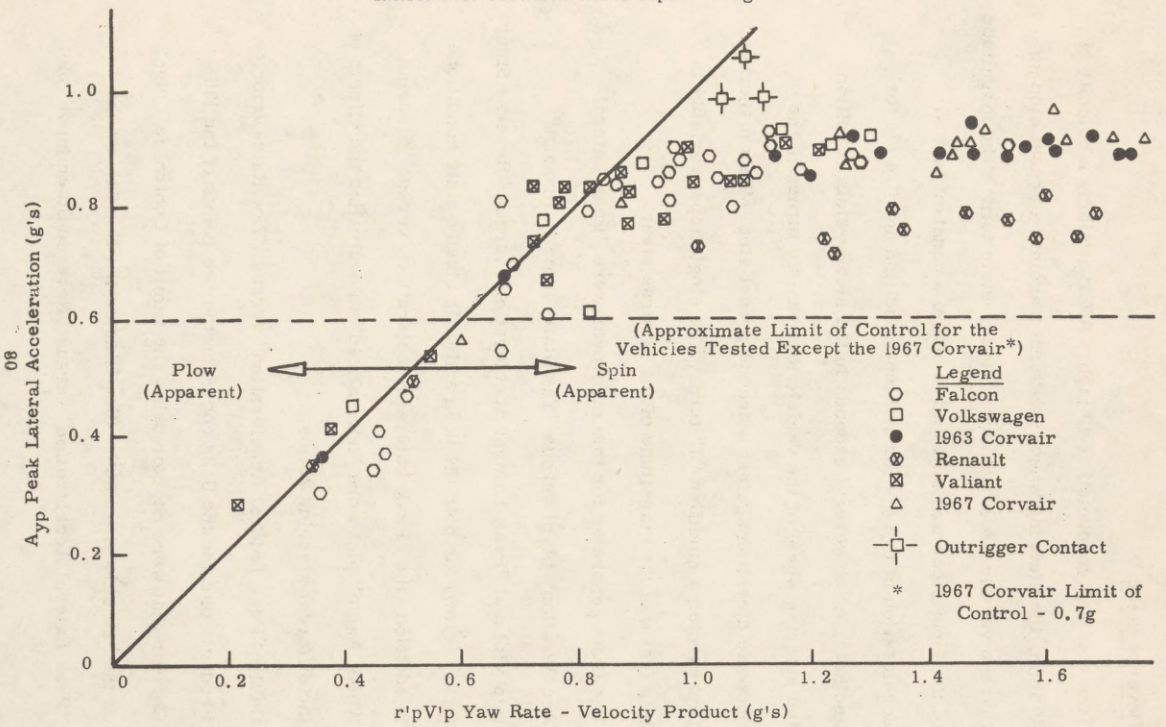


Illustration No. 26

the 1963 Corvair data fell between the Falcon-Valiant and the Volkswagen-Renault points and were almost the same as the 1967 Corvair. (See Illustration No. 27) When the "Reverse Steer Angle" was "normalized" on the percent of initial left turn steering degrees for 0.3g and plotted against "Peak Lateral Acceleration" the 1963 Corvair fell between the 1967 Corvair, which was the highest, and the other vehicles tested. (See Illustration No. 28)

A significant point of interest during this test was that the Volkswagen made outrigger contact three times. (See Illustration Nos. 26, 27, 28) After the third outrigger contact, the test was terminated for fear of damaging the vehicle for the remaining tests and the limited supply of wheels on hand. During each outrigger contact, the outside wheels would get bent or scrapped.

On the "Peak Lateral Acceleration" versus "Yaw Rate-Velocity Product" plot for the 0.4g condition, the 1963 Corvair only had one point below the "Limit of Control Line" and it was slightly to the right of a similar point for the Falcon. They were both on the "spin" side of the "no side slip line". See Illustration No. 29)

On the "Peak Lateral Acceleration" versus "Reverse Steer Input" for the 0.4g condition, the data points for the 1963

85-820 O - 73 - 20

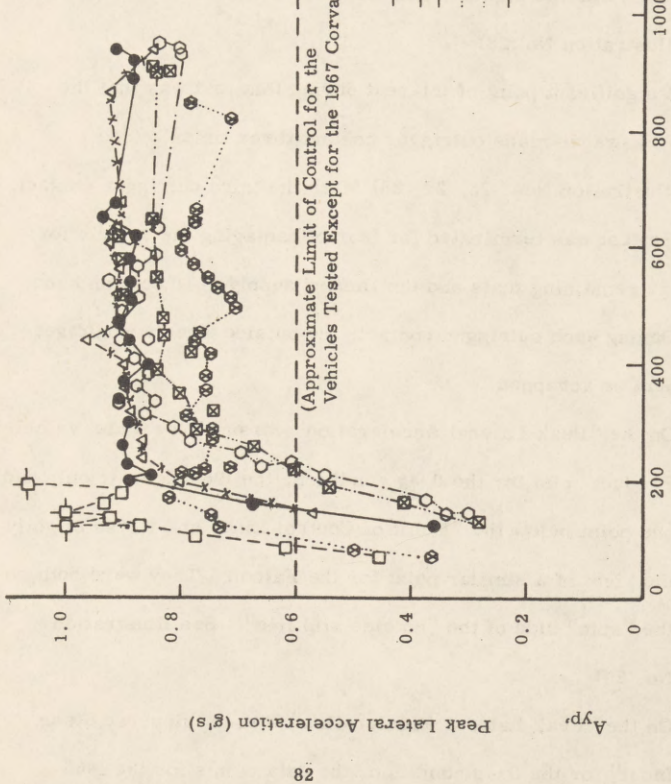


Illustration No. 27

REVERSE STEER

Peak g's In The Right Turn As a Percent of Steering Degrees Required
For The 0.3g Lateral Acceleration For The Initial Left Turn Stabilized Input

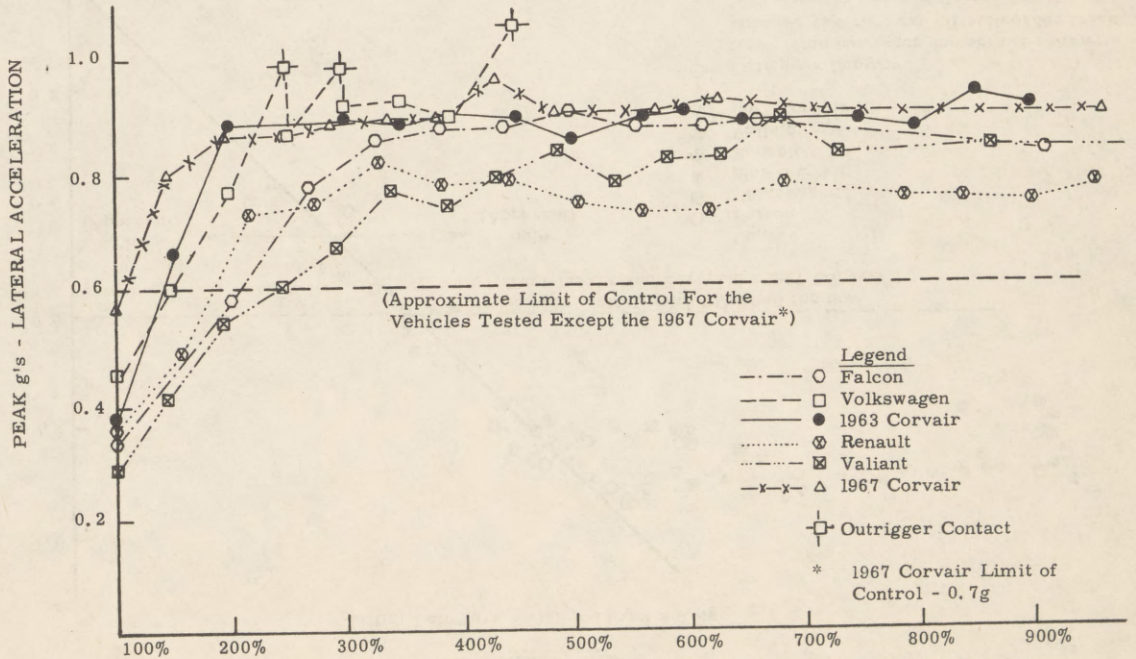
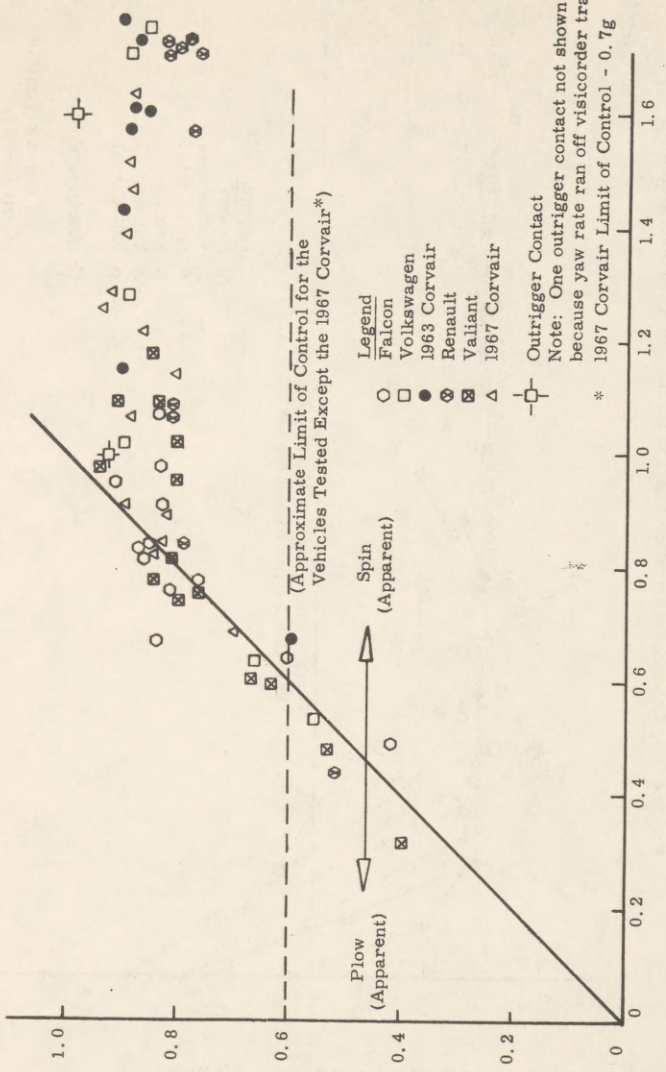


Illustration No. 28



84

Illustration No. 29

Corvair fell between the Volkswagen and Renault on one side and the 1967 Corvair, Falcon, and Valiant on the other side. (See Illustration No. 30) When the "Peak Lateral Acceleration" was plotted versus the "normalized steering inputs", the data points for the 1963 Corvair fell between the 1967 Corvair, which were the highest, and the other vehicles. (See Illustration No. 31)

Again, a significant point of interest during this test was that the Volkswagen made outrigger contact three times. (See Illustration Nos. 29, 30, 31) Although the last outrigger contact was made at the full steering stop, the regular stepped increases between the second outrigger contact to full steering stop were not made for fear of damaging the vehicle for the remaining test and because of the limited supply of wheels available.

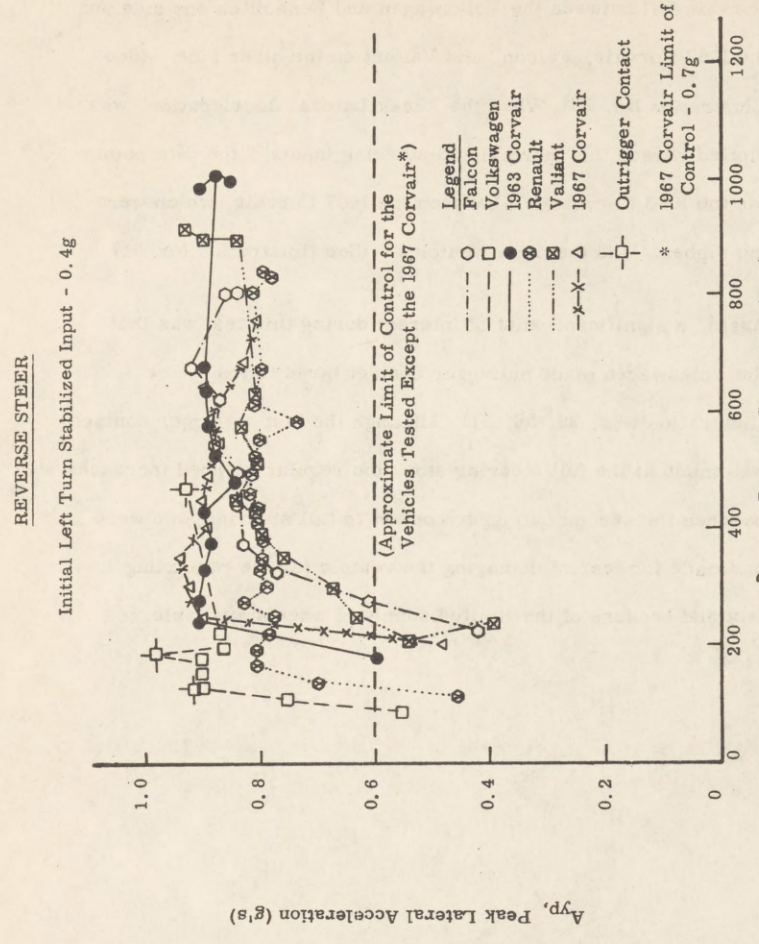


Illustration No. 30

REVERSE STEER

Peak g's In The Right Turn as a Percent of Steering Degrees Required
For 0.4g Lateral Acceleration For The Initial Left Turn Stabilized Input

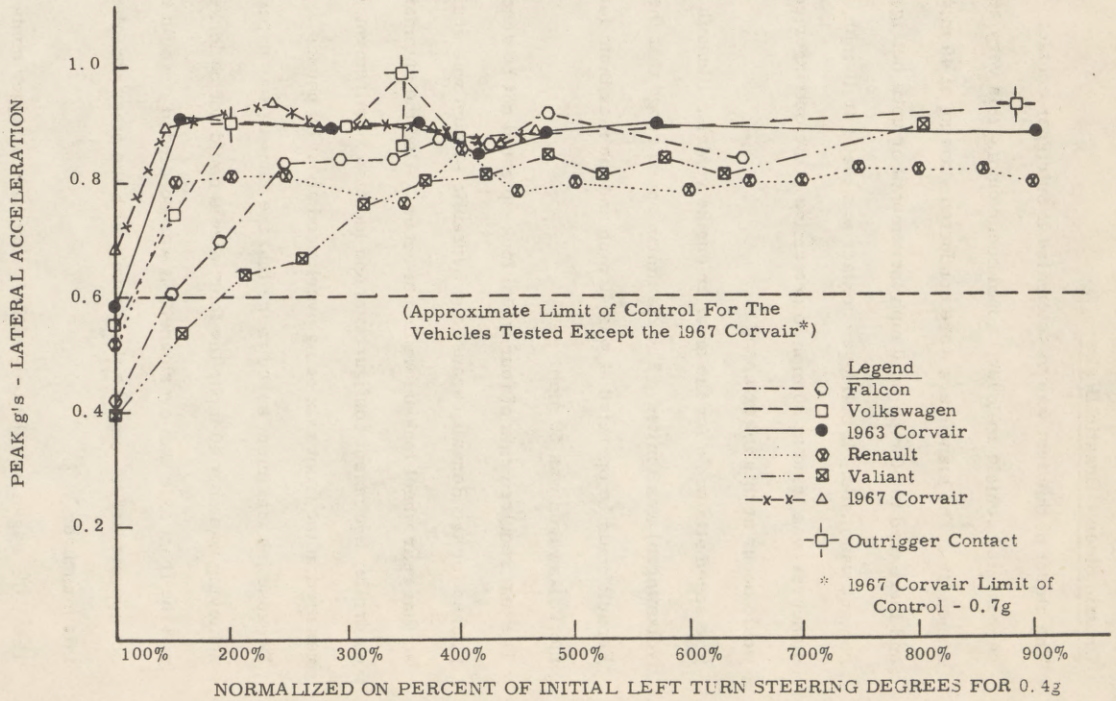


Illustration No. 31

Drastic Steer - Drastic Brake

The object of this test was to determine if outrigger contact, which represented vehicle rollover, would occur during this very severe maneuver. The maneuvers were conducted starting at 40 mph and increased to 60 mph in 10 mph increments or until outrigger contact was made. If outrigger contact was made at 40 mph, the maneuver was tried at 30 mph to determine if the outrigger contact would occur at this lower speed.

The speed attainable for the smaller engine vehicles (Renault and Volkswagen) was limited. The maximum speed range that the Renault could be operated at was 40 mph and the maximum for the Volkswagen was 50 mph.

The test requirements of four wheel lock-up could not be accomplished for the Renault because the hydraulic system was designed so that rear wheel lock-up would not occur. Also the automatic controller equipment configuration and location requirement resulted in the front axle being overloaded about 60 pounds. Because the maximum speed range that the Renault was capable of achieving was only 40 mph, the four wheels could not be locked, and the front axle was overloaded, it was concluded it would be not appropriate to compare the Renault with the other vehicles for this maneuver.

The Volkswagen was the only vehicle that had outrigger contact

during the Drastic Steer-Drastic Brake maneuver. It had outrigger contact at the 40 mph and 50 mph speeds. (See Illustration No. 32) There was no outrigger contact at 30 mph. Although the test guidelines did not require that tests further be conducted at a higher speed after contact was made at 40 mph, the test maneuver was also conducted at 50 mph in the interest of determining what steering input might induce outrigger contact at the higher speed.

DRASTIC STEER - DRASTIC BRAKE

Speed MPH	Steer Input (deg)	Outrigger Contact: Falcon	1963 Corvair	Renault	Valiant	1967 Corvair	Volks-Wagen	Comments
30	400						NO	
40	70						NO	
40	100		NO					
40	120			NO				
40	130						NO	
40	155			NO				
40	160						NO	
40	190			NO				
40	200	NO	NO		NO	NO	NO	
40	225			NO			NO	
40	250						YES	No outrigger contact occurred on repeat run
40	260			NO				
40	275						NO	
40	300	NO	NO	NO	NO	NO	NO	
40	325						NO	
40	350			NO	NO	NO	YES	No outrigger contact occurred on repeat run
40	375						YES	Outrigger contact on the two repeat runs
40	400	NO	NO	NO	NO	NO		
50	100		NO					
50	175						NO	
50	200	NO	NO		NO	NO	NO	
50	225						NO	
50	250				NO	NO	NO	
50	275						YES	Outrigger contact on first repeat run. No contact occurred on the second repeat run.
50	300	NO	NO		NO		NO	
50	325						YES	Outrigger contact on first repeat run. No second repeat run because of breakdown of controller.
50	350		NO		NO	NO		
50	400	NO	NO		NO	NO		
60	200	NO	NO		NO	NO		
60	300	NO	NO		NO	NO		
60	350		NO		NO	NO		
60	400	NO	NO		NO	NO		

Illustration No. 32

IV. CONCLUSIONS

During the course of this investigation, large quantities of information concerning the 1960-1963 Corvair were reviewed by NHTSA engineers. This information included extensive data obtained from General Motors, input from Mr. Nader and his associates, numerous technical and consumer publications concerning vehicle handling, sworn testimony from several court proceedings, comparison vehicle testing by Ford Motor Company, and NHTSA vehicle test data.

After careful and deliberate analysis of the information, the following conclusions are made:

1. The 1960-1963 Corvair understeers in the same manner as conventional passenger cars up to about 0.4g lateral acceleration.

2. The transition from understeer, through neutral steer, to moderate oversteer occurs in a range from about 0.4g to 0.5g, lateral acceleration. This transition does not result in abnormal potential for loss of control.

3. The limit of control for the 1960-1963 Corvair is 0.6g sustained lateral acceleration, which is comparable to contemporary solid rear axle, front engine domestic vehicles.

4. The 1960-1963 Corvair was found to have no critical speed.

5. The limited accident data available indicates that the rollover rate of the 1960-1963 Corvair is comparable to other light domestic cars. One accident study shows the Corvair to have a higher percentage of rollover accidents, while another indicates it to be slightly lower.

6. The Corvair compared favorably with the other contemporary vehicles used in the following NHTSA Input Response Tests:

   Steady Turn Braking, Smooth Road simulating the maneuver required in an emergency situation, bringing the vehicle to a stop on a curve with little or no deviation from its intended path.

   Steady Turn, Rough Road simulating a vehicle cornering at high lateral acceleration and encountering a series of bumps or road obstructions.

   Step Steer simulating a "J" turn.

   Reverse Steer Input simulating a modified "J" turn.

   Drastic Steer, Drastic Brake This test was mechanically controlled test without a driver and was the one which Highway Safety Research Institute had concluded was most apt to place a vehicle in the rollover mode.

For many of the tests the plotted data indicated that the Corvair performance fell between the Valiant and Falcon on one side and the Volkswagen and Renault on the other side. Outrigger contact (representing vehicle rollover) did not occur in any of the comparative tests for the Corvair, Falcon or Valiant. Outrigger contact was made by the Volkswagen and the Renault in some of the comparative tests.

7. The comments by Messrs. Smith, Fonda, and Sergay about the General Motors Proving Ground reports PG 15699 and PG 17103 and the analysis by Mr. Copp of a Ford Motor Company film, "1960 Falcon-Corvair Handling Comparison" do not provide any valid data for a determination that the handling and stability of the 1960-1963 Corvair is unsafe.

It is concluded that the handling and stability performance of the 1960-1963 Corvair does not result in an abnormal potential for loss of control or rollover and that its handling and stability performance is at least as good as the performance of some contemporary vehicles both foreign and domestic.

V. LIST OF ILLUSTRATIONS

Number	Subject
1	Oversteer or Understeer, at Limit of Control, or Without Steering Correction
2	Maximum Lateral Acceleration
3	Lateral Acceleration as a Function of Speed in Curves
4	Maximum Steady State Lateral Acceleration at Limit of Control of Domestic and Foreign Passenger Cars
5	Steer Properties - Constant Forward Speed
6	Classification of Car Groups According to Year and Make
7	Frequency of Principal Rollover (Utah) %
8	Percent Distribution of Accident Type Standardized by Driver Age
9	Ride and Handling Roads Ford Motor Company
10	Path of Vehicles in Outside Lane of Circular Test Track
11	Circular Test Track Reference Point for Speed and Lateral Acceleration Calculations
12	Vehicle under Control--Near End of Second Curve
13	Driver Giving Additional Steering Input--Near End of Second Curve
14	Vehicle Responding to Additional Steering Input--End of Second Curve
15	Steady Turn Braking - Smooth Road Impending One Wheel Lock-up Average Maximum Yaw Rate Deviation
16	Steady Turn Braking - Smooth Road Impending One Wheel Lock-up Average Heading Angle Deviation

LIST OF ILLUSTRATIONS
(Continued)

Number	Subject
17	Steady Turn Braking - Smooth Road Four Wheel Lock-up Average Maximum Yaw Rate Deviation
18	Steady Turn Braking - Smooth Road Four Wheel Lock-up Average Heading Angle Deviation
19	Steady Turn - Rough Road With Manufacturer's Recommended Tire Pressures Normalized Decrease in Lateral Acceleration
20	Steady Turn - Rough Road With Non-Recommended Tire Pressures Normalized Decrease in Lateral Acceleration
21	Steady Turn - Rough Road, Initial Response With Manufacturer's Recommended Tire Pressures Normalized Change in Yaw Rate
22	Steady Turn - Rough Road, Initial Response With Non-Recommended Tire Pressures Normalized Change in Yaw Rate
23	Step Steer Peak Lateral Acceleration vs. Yaw Rate-Velocity Product
24	Step Steer Peak Lateral Acceleration vs. Steering Wheel Angle
25	Step Steer Peak Lateral Acceleration Normalized on Percent of Initial Steering for 0.3g
26	Reverse Steer Initial Left Turn Stabilized Input - 0.3g Peak Lateral Acceleration vs. Yaw Rate - Velocity Product
27	Reverse Steer Initial Left Turn Stabilized Input - 0.3g Peak Lateral Acceleration vs. Reverse Steer Input

LIST OF ILLUSTRATIONS
(Continued)

Number	Subject
28	Reverse Steer Peak Lateral Acceleration Normalized on Percent of Initial Left Turn Steering Degrees for 0.3g
29	Reverse Steer Initial Left Turn Stabilized Input - 0.4g Peak Lateral Acceleration vs. Yaw Rate - Velocity Product
30	Reverse Steer Initial Left Turn Stabilized Input - 0.4g Peak Lateral Acceleration vs. Reverse Steer Input
31	Reverse Steer Peak Lateral Acceleration Normalized on Percent of Initial Left Turn Steering Degrees for 0.4g
32	Drastic Steer - Drastic Brake Table of Results

VI. DOCUMENTS ANALYZED

Note: The items recognized as manufacturers proprietory items are not included.

1. A policy on Geometric Design of Rural Highways, 1965, ASSHO.
2. Twelfth Stapp Car Crash Conference, 1968, S.A.E.
3. The University of N. C. Highway Research Center Driver Injury in Automobile Accidents Involving Certain Car Models, 1970, B. J. Campbell.
4. Study of Volkswagen Accidents in the U.S.A., 1968, Automobile Crash Injury Research, Cornell.
5. What Makes Cars Handle Part I and II, Jim Hall.
6. Road Test, Corvair, Autocar, January 6, 1961.
7. European Post War Cars, 1953, M. Olley.
8. Mechanics of Vehicles, J. J. Tarborek.
9. Vehicle Dynamics Terminology (J670a&b) S.A.E.
10. Suspension and Handling (Road and Track), Ron Wakefield.
11. A Study of Rollover in Rural U.S.A., Automobile Accidents, Cornell, J. W. Garrett, 1967.
12. Chevrolet Workshop Manuals for Corvair 1960 to 1968.
13. Unsafe at any Speed, 1966, R. Nader.
14. The Assasination of the Corvair, A. J. White.
15. Steering Diagnosis (In-use Vehicle Handling), Clayton.
16. Standard for Handling Characteristics of Automobiles, W. E. Mulliken, Jr. and F. Dell'Amico, Cornell Aeronautical Laboratory, Inc., July 1968.
17. A Study of the Relation between Forward Velocity and Lateral Acceleration in Curves During Normal Driving. (Extracted from Human Factors, 1968, 10(3) 255 - 258), Malcolm L. Richie, William K. McCoy and William L. Welde

85-820 O - 73 - 21

DOCUMENTS ANALYZED

18. Lateral Forces on Vehicles During Driving (Extracted from Automobile Engineer, December 1967), J. G. Smith and J. E. Smith.

19. Traffic Engineering and Control (Extracted from International Road Safety and Traffic Review), J. Emmerson.

20. Vehicle Handling Test Procedures (Under FH 11-7297), Highway Safety Research Institute, University of Michigan, November 1970.

21. Magazine Articles Reviewed:

Consumers Reports,	Page	39,	Jan. 1960
Consumers Reports,	Page	195,	Apr. 1960
Consumers Reports,	Page	377,	Jul. 1960
Consumers Reports,	Page	191,	Apr. 1961
Consumers Reports,	Page	144,	Mar. 1961
Consumers Reports,	Page	46,	Jan. 1962
Consumers Reports,	Page	135,	Mar. 1962
Mechanix Illustrated,	Page	63,	Nov. 1959
Mechanix Illustrated,	Page	74,	Oct. 1962
Autocar (Road Test Report)	Page	29,	Jun. 1961
Road and Track	Page	28,	Nov. 1959
Autocar (Road Test Report)	Page	116,	Apr. 1962
Popular Mechanics,	Page	103,	Oct. 1959
Popular Mechanics,	Page	125,	Mar. 1960
Popular Science,	Page	108,	Oct. 1959
Popular Science,	Page	112,	Jan. 1960
Popular Science,	Page	77,	Apr. 1962
Popular Mechanics,	Page	106,	Sept. 1961
Popular Science	Page	84,	Oct. 1960

22. General Motors Corporation Data

ITEM I - A - 3

P. G. Report No. 11245, Tire Blowout Comparison at 60 mph., 1959 Chevrolet and 1960 Corvair

"Handling Characteristics of Automobiles" by Dr. T. Manos, Iowa Public Hearing on Automotive Safety

Deposition of Dr. T. Manos in Anderson vs. General Motors

List of Alleged Corvair Defects as Given by D. Harney, Plaintiffs' Attorney

Opening Statement on Behalf of the Plaintiffs by D. Harney in Collins vs. General Motors

DOCUMENTS ANALYZED
General Motors Corporation (Continued)

M. I. R. A. Report - V. A. II
Closing Arguments, Collins v. s. GMC
Closing Arguments, Drummond v. s. GMC

ITEM II - B, CHEVROLET TEST REPORTS

T. W. O. 25004-13	T. W. O. 25014-47	T. W. O. 25513-14
T. W. O. 25013-59	T. W. O. 25014-51	T. W. O. 25564-37
T. W. O. 25014-46	T. W. O. 25508-4	T. W. O. 25585 (Ref. PG-13685)

ITEM II - C, PROVING GROUND REPORTS

P. G. -14737
P. G. -14752
P. G. -17118 (Ref. TWO 29111-10)
P. G. -17854
P. G. -19577
P. G. -15699
P. G. -17103

ITEM III - A - 1, DRUMMOND DECISION

ITEM III - A - 3, COMPLETE WINCHELL TRANSCRIPT

ITEM III - A - 4

Summary - Corvair Dimensions and Characteristics

Corvair Ownership List

S. A. E. Paper #140C

S. A. E. Paper #143D

Comments on ACIR, CAL. No. VJ-1823-R32

ITEM III - A - 5, LANSING PRESENTATION AND BACKGROUND INFORMATION

Letter and Copy of Statement by G. M. C. before Michigan Senate Highway Committee, February 21, 1966

DOCUMENTS ANALYZED
General Motors Corporation (Continued)

Transcript of F. J. Winchell's Statement

F. J. Winchell's Exhibits

Michigan Senate Bill #766-773 and back-up material

Statements of the Other Witnesses Before the Michigan Senate Highway Committee, February 21, 1966

Rim to Ground Clearance Photographs

ITEM III - A - 6, EXCERPTS OF TESTIMONY

FILMS

A-50 Free Control

A-53 Normal and Hard Driving

A-64 Simulated Roadability Film

A-83 Fixed Steering Film - Corvair-in-Car

A-84 Fixed Steering Film - Corvair-outside

A-85 Fixed Steering Film - Falcon-in-Car

A-86 Fixed Steering Film - Falcon-outside

A-88 Skidpad Limit of Control - Corvair-in-Car

A-89 Skidpad Limit of Control - Corvair-outside

A-90 Skidpad Limit of Control - Falcon-in-Car

A-91 Skidpad Limit of Control - Falcon-outside

A-93 Film Showing the Effect of Ride Motions during Cornering - Corvair-in-Car

DOCUMENTS ANALYZED
General Motors Corporation (Continued)

A-94 Film Showing the Effect of Ride Motions during Cornering - Corvair-outside

A-95 Film Showing the Effect of Ride Motions during Cornering Falcon-in-Car

A-96 Film Showing the Effect of Ride Motions during Cornering - Falcon-outside

A-98 Film Showing J-Turns with and without Braking - Corvair-in-Car

A-99 Film Showing J-Turns with and without Braking - Corvair-outside

B-1 Film Showing J-Turns with and without Braking - Falcon-in-Car

B-2 Film Showing J-Turns with and without Braking - Falcon-outside

B-8 Ride and Handling Road Film - Corvair-in-Car

B-9 Ride and Handling Road Film - Falcon-in-Car

B-10 Ride and Handling Road Film - Belair Chevy II-in-Car

B-12 Vehicle Evasive Performance - In-Car

B-13 Vehicle Evasive Performance - Outside view

B-29 Ramp Film - Corvair-outside

B-30 Critical Speed Film - Corvair-in-Car

Exhibit "N" - Film of Driving at the Drummond Accident Site (Suspension Camera)

Exhibit "M" - Film of Driving at the Drummond Accident Site (Inside Camera)

Exhibit #48 - O'Shea Pomona Film

ITEM I - A - 1, Model Car on Ramp Film

DOCUMENTS ANALYZED
General Motors Corporation (Continued)

ITEM I - A - 3(j), Vehicle and Driver Performance Film

ITEM III - A - 4, Movie Pomona Rollover Attempts

ITEM III - A - 5, Movie #7 Normal and Hard Driving

ITEM III - A - 5, Movie #8 Simulated Roadability

ITEM III - A - 5, Movie #2 J-Turns

Film for PG 11106

Film for PG 11304

Film for PG 11285

Film for PG 15699

Film for PG 17103

Dynamic Roadability - Corvair - Views of Both Rear Wheels During Skid Pad Runs

Exhibit #74 - Part 1 and 2 - Rollover Test of the Shock Absorber Lower Mounting Bracket

Exhibit #75 - O'Shea - Manos Film

SLIDES

ITEM III - A - 5, Slides in F. J. Winchell Presentation - Lansing, Michigan, February 21, 1966 (Slides #1, 3, 4, 5, 6, 10, 11, 12/13, 14)

23. Ford Motor Company Data

Film - "1960 Falcon-Corvair Handling Comparison" and analysis by Harley Copp.

Intra Company Communication, Subject: Vehicle Response Characteristics of Test Vehicle GAP#1 dated November 8, 1968

APPENDIX I

Letter - Mr. Ralph Nader to Secretary of Transportation, John A. Volpe, Dated September 4, 1970

September 4, 1970

Honorable John A. Volpe
Secretary of Transportation
Department of Transportation
Washington, D.C.

Dear Secretary Volpe:

For five years, nearly four of them under the auto safety law, the federal government has declined to become involved in the Corvair matter, notwithstanding the mass of evidence as to its hazards which has been externally collected and transmitted to the government. Now comes decisive evidence which reveals a labyrinthic and systemati intra-company collusion, involving high General Motors officials, to sequester and suppress company produced data and films proving the Corvair (1960-63 models) dangerously unstable. The Department of Transportation can no longer avoid confronting the GM-Corvair depravity and the daily carnage of innocent people injured or killed in these vehicles. Probably 600,000 of these Corvairs are still on the roads, driven increasingly by the young and the poor. Little can be done about past Corvair casualties, except as a spur to this dismaying refusal to act by the Department. Much can be done to prevent further crash-injuries and to understand additional, serious design defects affecting all Corvairs (1960-1969 models). But first it is necessary to understand the enormity of what General Motors officials have done to their customers (and passengers), the federal government, the courts and any American who trusted the testimony and assurances of the nation's largest industrial corporation. For in a word, GM manufactured and maintained a massive lie.

The company's credibility is not at stake here. Its credibility is shattered here. It can now be reliably asserted that GM proving ground tests and films back in 1962-63 conclusively proved the Corvair to be uniquely unstable with unprecedented rollover capability unlike any other American car. (Such characteristics were known by GM engineers when the Corvair was in its design stage back in the late Fifties. But the cautions of the more concerned were over-ridden by management which refused to adopt a much safer suspension system then available.) None of this information was ever

offered or disclosed in response to court orders to produce such or any other requests from federal and state officials. On the contrary, in a consistent posture of suppression and prevarication, the company declared the Corvair as safe as any other car and asserted that any claims to its lack of safety were false.

Before the Senate Subcommittee on Executive Reorganization on March 22, 1966, James M. Roche, then President, General Motors Corp. read approvingly into the hearing record a statement by GM's Assistant General Counsel, Louis H. Bridenstine and a technical account by Mr. Frank Winchell, Chief Engineer for Research and Development of Chevrolet Motor Division, which will become principal exhibits of the falsehoods and distortion utilized by the company's spokesmen. Other GM officials, including Mr. Edward Cole, now the company president and long known as the "father of the Corvair" stated what GM's own tests said was not so about the vehicle's handling.

Mr. Winchell's statement was replete with statements contradicted by GM's own, secret test data and films to which Mr. Winchell had access. For example, in words to be substantially repeated under oath before courts across the land, Mr. Winchell told the Michigan Senate Committee on Highways (February 21, 1966) that "The Corvair differs from other cars only in the arrangement of its components." and "Photographs of tire distortions with a car sliding sideways will show no significant difference between the proximity of the rim to the pavement of the Corvair and any other automobile." These statements were made by Mr. Winchell, now a special assistant to Mr. Cole, although they are contradicted by GM proving ground data and films which were completed between three and nearly four years earlier.

Despite repeated interrogatories and motions to produce in litigation involving crash victims, these data and films were secreted in a special category of "hot documents". For example, your Department should be interested in obtaining all the reports, memos and films growing out of PG Job No. 032127 beginning approximately April 11, 1962 and specifically including those portions dealing with Test run numbers 46-50, 58, 71, 75, 80, 86, 92, 99, 104; and arising out of PG Job No. 032307 beginning approximately Nov. 13, 1962 and specifically including those portions dealing with test run numbers 117, 120, 125, 126, 127-31, 134, 135-36. These films showing roll overs at speeds of 26 mph, 28 mph, and 30 mph would be enlightening repudiation of the shocking disparities articulated in courts and before legislative hearings by GM officials.

In the afore-mentioned Michigan testimony, Mr. Bridenstine, now GM's number two lawyer (after General Counsel Ross Malone) had the presumption of raising the Canons of Professional Ethics regarding the behavior of a Detroit attorney while he has been closely involved in keeping suppressed the test data and films by GM's own engineers showing the early Corvairs to be exceptionally facile roll over candidates. He maintained this stance against the regular crashes incident to Corvair rollovers week after week and against the court sanctioned interrogatories put to GM for this material. The canons may well be applied to Mr. Bridenstine's behavior.

Pertinent to this suppression of data damaging to the Corvair and the public statement and testimony that all was well with the vehicle is the company's tactics of attrition and judicial manipulation. In a major Corvair trial, GM's presentation misled the California judge, Bernard Jefferson, into writing a lengthy opinion concluding that the Corvair design was not unsafely designed. Having obtained such a decision, GM proceeded to transform it into a promotion and in an obscene gesture perhaps unheard of in corporate legal history, initiated its distribution to its Chevrolet dealers, state and federal legislators and other influential recipients including judges. Sizable settlements in Corvair litigation are associated with how close plaintiff's lawyer gets to the "hot documents" in his discovery motions. If GM's lawyers could not wear the plaintiff down by dilatory techniques, or flout the discovery orders with impunity, the company order from the top would be to 'purchase the case' with a settlement. Several settlements have exceeded the $100,000 level.

The afore-mentioned test data, together with other memoranda, letters, and corroborating personnel, show conclusively that:

GM officials knew they had a safety problem involving rollover and uncontrollability before the Corvair litigation started about 1963, and dabbled with a cheap prospective technical "fix" that flopped;

GM officials consciously refused to issue warnings or recall the vehicles;

GM officials launched a policy of falsely stating that the Corvair did not behave differently than any other American car and misled members of three branches of government at both state and federal levels;

GM officials demanded or condoned unethical behavior by its lawyers and engineers which had major repercussions on the frequency of Corvair crashes and casualties;

GM officials at the highest level were responsible for the preceding policies and spared no expense to perpetuate false defense strategies in the courts and suppression of GM's own tests adverse to the Corvair;

The gravity of the situation proceeds from the personal responsibility of the Chairman of the Board, Mr. Roche, and the President, Mr. Cole. For years, they have been on notice as to the problems of the Corvair; indeed Mr. Cole took a personal role in its design. For years, their legal duties to the public safety, not to mention their shareholders, should have required the disclosure of all company test data, regardless of its criticality, simply because American lives are involved. For years, they actively defended the Corvair and carefully avoided true disclosure. If in the annals of corporate irresponsibility this behavior is not grounds for resignation, then the monster of corporatism has overtaken the law. They should both resign.

The situation of Mr. Ross Malone, GM's General Counsel and former President of the American Bar Association is one of a need for prompt re-appraisal. Having joined the company nearly two years ago, he is the heir, rather than the shaper of most of the Corvair legal strategy. However, his duty is to require reversal of odious practices such as placing as many private, potential Corvair expert witnesses on a monthly retainer to monopolize this "market" around the country, or requiring attorney's with whom they settle to agree not to take anymore Corvair cases. More important, Mr. Malone must realize the grave impropriety of using his lawyers as a shield to hide lifesaving company test data and as a sword to defeat attempts to obtain such information under judicial procedures. One has only to read the newspapers' regular descriptions of sudden rollover Corvair crashes to realize that the proper legal advice to the corporate client is to promptly warn motorists and recall and fix the source of instability, not to camouflage the truth and mass the company's legal resources to overwhelm plaintiffs and tie up the courts. There is the added responsibility for corporate counsel to review all cases where interrogatories were not responded to truthfully and completely.

Hon. John A. Volpe Sept. 4, 1970

A design defect that affects all Corvair models from 1960 to 1969 permits the seepage of combustion chamber gases into the passenger compartment along with the heated air. These gases include carbon monoxide. This is a very common complaint, as many letters to the National Highway Safety Bureau and General Motors show. GM has hundreds of these complaints. Privately, both present and former engineers for the company concede the defect, but the company policy officials continue to cover it up. In the opinion of specialists, this is a most serious hazard and has been known to overwhelm or sicken the driver. Further information known to GM is forthcoming for your consideration.

Clearly, the Department of Transportation has the authority to take action to protect motorists and passengers. It can require GM to send a notification of defect(s) to all Corvair owners. Although this year GM defeated a request by the National Highway Safety Bureau to obtain congressional authority to compel recalls, the requirement to notify usually involves a recall.

The Department should also request from Mr. Roche a complete report on the Corvair design and the company's secret test and film data and relevant memoranda. It must be emphasized that the materials and other associated facts will soon be released irrespective of whether or not he takes this opportunity to assert full corporate responsibility.

While to some, the cessation of Corvair production means the vehicle is history, the fact is that Corvairs are being driven every day hundreds of thousands of miles by hundreds of thousands of drivers under latent hazards that should be considered intolerable by your Department. Your counsel has exerted authority to require defect notification on pre-1966 vehicles in the Chevrolet truck wheel defect. This range of vehicle defects for the Corvair is much more serious in volume and severity. The preposterous pretext underlying National Highway Safety Bureau inaction regarding the Corvair--namely that there is civil litigation pending--borders on malfeasance in office. Civil litigation should never block enforcement of the law.

How corporations react to crises of their own making is increasingly tending toward cataclysmic potential for many citizens, as companies

Hon. John A. Volpe Sept. 4, 1970

become larger and their technology more complexly fraught with hazards. General Motors, thanks to outside pressures and inquiries, no longer receives uncritical deference to its alleged knowhow that was its unearned increment from society. Too many facts have been unloosed among the public in recent years about the company's suppression of pollution control technology, its profligate expenditures on profitable trivia and wasteful corporate ego trips to the detriment of attention to safety, durability, ease of repair and efficiency in vehicle operation. At the present time, GM lobbyists and lawyers are all over Washington pursuing callous drives to seriously weaken the air pollution legislation and to delay the installation of the air bag, or similar system, in motor vehicles so thousands of lives could be saved in crashes. Their collusion with other auto companies in these efforts, particularly the pollution lobbying, makes a mockery out of the consent decree which they signed last year with the Antitrust Division of the Justice Department.

Further revelations about Corvair collusion and suppression, known and condoned at the highest GM levels, will open new public understandings of the extent to which this company will go to shield its defective vehicles even from its own self-indictment of them.

I look forward to your response.

Sincerely yours,

Ralph Nader

APPENDIX II

Letter - Mr. Ralph Nader to Secretary of Transportation, John A. Volpe, Dated December 15, 1970

December 15, 1970

Honorable John Volpe
Secretary of Transportation
Washington, D.C. 20591

Dear Mr. Secretary:

Since my letter to you dated September 4, 1970, disclosures and evaluations are now available, such as PG Reports 17103 and 15699, which intensify the need and justification for prompt remedial action by the Department of Transportation concerning the hazards of the 1960-63 Corvair.

Since that date and the announcement shortly thereafter of the Department's decision to conduct a preliminary examination of Corvair instability in order to decide whether ornot to initiate a formal investigation, we have received corroborative information from dozens of people knowledgeable about the manufacture and safety performance of the Corvair. This information has been made available to the National Highway Safety Bureau to the extent possible without adversely affecting the jobs or standing of our sources, and we have also suggested other pertinent information which we believe should be obtained by the Bureau in order for them to objectively evaluate the problem. In toto, the information now available to the Department (presuming it has now been solicited and evaluated) reveals a great disparity between the actual rollover propensity of the Corvair and both the promises that GM has given its customers and the public, and the representations in the 1966 testimony of Mr. James Roche, then President of GM, before the United States Senate.

The emergence of all of this new evidence demonstrates the grave peril facing millions of people as long as the early Corvairs continue on the highway without a retrofit. However, the issue here is even larger. If the Department of Transportation fails to act in this case on the basis of such theories as the one that other vehicles, like the Volkswagen, also exhibit a propensity to rollover, its erroneous rationale would represent an insidious precedent in the safety arena. It would also represent a sanctioning of the most open, notorious and continual misrepresentations by General Motors.

As an aid to the interpretation of the mass of materials (much of its irrelevant) which has been submitted to the Bureau by GM, and in an effort to lay bare the nature of the engineering problem which creates the hazards in the Corvair, and to determine how easily the Corvair defect can be corrected at low cost, I asked three qualified engineers, who are experts in vehicle handling, a number of questions pertinent to Corvair instability/rollover. Their detailed answers are attached for review and analysis by the National Highway Safety Bureau.

In short, I asked these engineers, based on their knowledge, expertise and analysis of the two long-suppressed GM proving ground reports, PG 17103 and PG 15699, for their comments on the origin and nature of Corvair rollover and instability; the minimum types of evidence which an engineer would need, in the light of the findings of these two General Motors PG reports, to find that the 1960-63 Corvairs are not defective; whether degradation with age affects the Corvair problem; whether the vehicle should be recalled; and the feasibility and cost of fixing the vehicle.

In summary, they have concluded that the 1960-63 Corvair is inherently susceptible to rollover when it is traveling at low speeds on a flat surface, and therefore it should be recalled and repaired by General Motors.

Specifically, Mr. Fonda and Mr. Sergay stated:

"A conclusion that the 1960-63 Corvairs are not defective would require either a successful, credible and authoritative experimental contradiction of the two PG tests, or a credible demonstration that the criterion of no rollover on a flat road surface is overly conservative and unnecessary for assuring consumer safety.

"While we know of no such tests and obviously cannot state the results of tests not yet performed or published, we predict that further testing would only confirm the results of PG 15699 and PG 17103 and our interpretation thereof."

Since the engineers which General Motors has commissioned to discuss this matter with the Bureau officials are on partisan corporate missions, it would be advisable for the Bureau officials to contact the three engineers whose statements are attached for further exploration of their views.

I urge you to take note of the compelling estimate made by two of the engineers of the magnitude of the danger involved should the Department decide not to require defect notifications and should General Motors decide not to recall and retrofit these vehicles. Their estimates are based on the number of law suits filed against General Motors because of Corvair instability/rollover crashes. As far as I know this information is far more comprehensive than that available for any other model vehicle. In their opinion, very conservatively, the continuing danger inherent in this vehicle will, or will not, exact its fatal toll on at least 1,000 Americans plus a larger number of injuries, depending upon the Department's decision in this matter.

Please let me know if the Department has any disagreement or need for clarification of the attached statements.

While this letter is concerned with Corvair rollover and instability, I must again urge you to act immediately on the heater defect in all model years of the Corvair. The evidence of this defect leaves not the slightest doubt that millions of Corvair occupants are being exposed to injurious amounts of carbon monoxide and other combustion gases as they drive in winter conditions with heaters fully operating. Any further delay by the Department on this issue cannot be justified.

Sincerely,

Ralph Nader

Ralph Nader

STATEMENT BY RALPH SMITH*

In Response to Questions by Ralph Nader about the Implications of General Motors Proving Ground Tests of Corvair Rollover Propensities.

Introductory Statement

The following are my answers to questions posed by Ralph Nader, offered to him without any remuneration or promise thereof. They reflect my views regarding the extent to which the GM rollover test results found in Proving Ground (PG) reports numbered PG 17103 and PG 15699, which I have studied, apply to the production Corvair suspension pre-1964. My comments are directed at the implications of these specific test data on the overturn propensities of the Corvair when subjected to driving maneuvers which are similar to those experienced in the J-turn. I would like to emphasize that although rollover tendencies may be aggravated by directional instability, the two phenomenon are distinct motion properties,

I believe it to be probable that if the Corvair is directionally unstable in practical turning motions, then this will, in practice, create control difficulties which promote rollover situations.

A directionally unstable rear-engined vehicle, however, is not necessarily prone to rollover even though the rear suspension is of the swing axle type. An example of the latter might be various models of the Abarth automobile.

Question 1

If you were a design engineer and saw PG 17103 and PG 15699 results on a prototype vehicle being considered for production, would you recommend the car for production without any modifications?

Answer

No. Unequivocally. The PG tests have established the unquestionable tendency for the Corvair suspension described as "production" to promote rollover tendencies. When I evaluate the "production" vehicle within the framework of these findings, I find that it is entirely plausible that the hazards it entails to a general motoring public are beyond the bounds of normal risk. Consequently, the Corvair suspension used in these tests requires careful redesign, with the objective being to eliminate the rollover propensity in the J-turn tests, before it could be released for production. I could not ignore this potential problem, or devise rationalizations for approval of the design, without violating the engineering canons of ethical practice.

*Aeronautical Engineer, University of Cincinnati, Ohio. Degree candidate for PhD. in engineering at Princeton University (June, 1971). Work experience during the last six years: Fundamental research studies in the mechanics and control of automobiles; theory of pneumatic tire mechanics; aircraft handling qualities and human dynamics; written numerous papers and reports on car/driving; expert on man/machine systems. 210 E. Montgomery, Hatboro, Pa. 201-772-1630.

Question 2

How does the rollover and stability behavior of the 1960-63 Corvair, as revealed by PG 17103 and PG 15699, differ, if at all, from the behavior of other American cars and from foreign cars sold in the United States?

Answer

The ratio of tread width to center of gravity height is somewhat greater for the Corvair than found in contemporary, American conventional sedans. This measurement would indicate to me as an engineer that the Corvair would be more resistant to overturn than the conventional sedan. However, PG Report 15699 establishes that when subjected to very similar maneuvers, the 1961 Chevrolet never overturned while the early model Corvair (even with modifications to decrease rollover tendency) overturned in nine out of ten tests. This unusual difference must be attributed to Corvair suspension irregularities. The substantial changes in sensitivity of the Corvair to modifications in the suspension system as these PG tests demonstrate reinforces this statement.

The conviction that the Corvair's susceptibility to rollver is inherent in the production vehicle components and design is verified by the test data which show that Corvair rollover in the J-turn experiements can at least in one case be eliminated by proper suspension modifications. These tests were conducted by General Motors in mid-1962. To the best of my knowledge no significant production line changes on Corvair suspension were made until the fall of 1963.

The typical automobile in service on American roads today does not have the jacking prone swing axle rear suspension of the pre-1964 Corvair, and, in J turn experiments, would be expected to exhibit behavior similar to the stability of the 1961 Chevrolet sedan tested in these PG reports, i.e., no rollover.

The two PG tests do not concern foreign vehicles. However, I would not expect a vehicle with a properly designed swing axle rear suspension to demonstrate rollover tendency on smooth roads. Rollover proneness is not in my view necessarily a property of the swing axle suspension. The GM tests, and my experience, lead me to conclude that the rollover problem entails complex nonlinear interactions between tires, suspension and chassis. Thus, each vehicle regardless of design similarities, must be evaluated separately.

Question 3

What would you estimate in terms of cost to the manufacturer would be required to modify the rollover and stability behavior of the 1960-63 Corvair to make these Corvairs more comparable to other American cars?

Answer

The GM rollover tests in the two PG reports indicate that the Corvair's rollover problem could be reduced or eliminated at a cost to the manufacturer approximately equal to that of the costs of the heavy duty suspension package RPO 696 offered as an option for the 1962 model year Corvair. This includes: two new rear shock absorbers; new, stiffer, and shorter front and rear coil springs; two new rebound limiting straps; and a front stabilizer bar. A front-end alignment is also required with these modifications. As a "ball-park" figure I would estimate that the manufacturing costs

85-820 O - 73 - 22

for this package might be on the order of $10 to $15 (not counting alignment and installation costs or packaging and shipping at the dealer) broken down approximately as follows:

$2.00	Springs	$.50 each for 4
6.00	Rear Shocks	3.00 each for 2
2.00	Stabilizer bar and fittings	
1.00	Rebound-straps	$.50 each for 2
TOTAL $11.00		

Retro-fitting of this package should offer the additional benefit of improved directional stability and handling. Retro-fitting could eliminate many of the driver control problems that arise in emergency situations and that lead to large, transient, lateral accelerations. Retro-fitting would also therefore have the attendant possibility for reduced rollover frequency with these cars.

Question 4

In light of the results of PG reports 17103 and 15699, what are the minimum types of evidence which should be evaluated by an engineer in order to substantiate a conclusion that the 1960-63 Corvair is not defective under the provisions of the National Traffic and Motor Vehicle Safety Act of 1966 (that is, that its rollover tendencies could not be defined as a defect in performance, construction, components or materials)?

Answer

The evidence I examined of Corvair rollover (contained in the PG test results) when considered within thecontext of the practical driving environment, is suggestive of a fundamental design deficiency. The J turn experiment can be accurately visualized as a simulation of what happens in an emergency situation caused by a driver's loss of full vehicle control because of vehicle instability at high lateral accelerations, or from intentional evasive action taken to avoid an impending accident. It is my belief that the Corvair is directionally unstable at higher lateral acceleration; thus, any rapid evasive maneuver during cornering conditions would be likely to produce a tail-first spin--that is, a spin where the rear wheels skid before the front wheels. The resulting effects of this tail spin are similar to those encountered in the J turn.

A thorough engineering evaluation designed to objectively examine questions raised here regarding Corvair rollover might seek statistical data which accurately establishes the comparative frequency with which Corvairs have been involved in single car accidents (vis-a-vis the "conventional" sedan) as an indication of existing stability and control difficulty. Such statistics should exclude post-1963 models and those equipped with suspension options, insofar as this is possible. I have never seen such data. Statistics representative of the vehicle population concerning the frequency of Corvair rollovers in both single and multi-car accidents might also be sought as an indication of the magnitude of the rollover problem.

My view, however, is that the J turn experiment is so representative of actual emergency situations encountered in highway driving that these data are generally valid. In my opinion it would be extremely difficult for GM to offer valid rationalizations to refute the rollover problem indicated by the two PG reports.

Question 5

Does degradation with age affect the Corvair rollover or stability problem because of degradation of parts or otherwise of the Corvair? Is there a known test to determine degradation of suspension geometry? Is this a fatigue problem?

Answer

Degradation of Corvair suspension components with age or use probably has significant effect on the car's rollover tendencies. Wear of shock absorbers in particular would increase the Corvair's susceptibility to rollover in rapid evasive maneuvers typical of driving emergencies. The GM rollover tests provide clear indication of this. Degradation of suspension bushings might worsen an already poor rollover performance by increasing suspension rebound limits. A conventional suspension system would not generally exhibit increased susceptibility to rollover due to such component wear.

There is no easy way to field test a vehicle for suspension degradation. This in my opinion provides a primary engineering criticism of the Corvair's design. That is, the car clearly has a rollover problem with nominal components which is probably worsened with suspension wear; yet, there is no practical expedient for evaluating the suspension performance.

Component fatigue is not the central problem for Corvair suspension design. However, the nature of the swing axle design is such that fatigue failure of one component can easily lead to catastrophic failure of the entire system. The same is not true for the conventional vehicle.

Question 6

Based on your engineering expertise and the newly revealed technical data in PG 17103 and 15599, do you believe that the 1960-63 Corvairs should now be recalled by the manufacturer and retrofitted to reduce rollover tendency?

Answer.

Yes.

STATEMENT BY ALBERT G. FONDA* AND DIMITRY SERGAY**

In Response to Questions From Ralph Nader about the Implications of General Motors Proving Ground Tests of Corvair Rollover Propensities

Introductory Statement

We have prepared this analysis in the public interest and therefore we have neither received nor expect to receive any compensation for this work. We have only received minor and partial reimbursement for our travel expenses.

We have studied the questions submitted to us by Mr. Ralph Nader and have reworded them slightly so as to completely and fully respond to the issues as we understand them. Our answers concern the extent to which the GM rollover test results found in Proving Ground (PG) reports numbered PG 17103 and PG 15699 apply to the early model Corvair production suspension and handling.

Question 1

If you were a design engineer and saw PG 17103 and PG 15699 test results on a prototype vehicle being considered for production, would you have recommended any of the reported test cars for production?

Answer

No. This opinion is offered with respect to only one criterion, that of rollover safety. The tests of PG 15699 and 17103, for purposes of our evaluation here, are directed only towards evaluation of rollover characteristics. Most of the Corvair vehicles tested were dangerously prone rollover. Of the safer vehicles, one had overhanging rear weights for test purposes only; the remaining two had modifications worthy of further consideration but were not ready for production decision.

Question 2

Are any of these test runs representative of the Corvairs which were actually produced and sold in 1960-63?

Answer

The vehicle of run 120 of PG 17103 appears in all respects as being a vehicle representative of 1963 production Corvairs. As far as we can

*BME 1951 and MS 1954, Cornell University (with additional courses). Two years design research and teaching experience with agricultural machinery. Five years automotive dynamics and tire behavior research. Eleven years aircraft and space craft dynamics research. Eight years forensic engineering in automotive and mechanic product liability litigation (including consultant to automotive companies) plus highway crash barrier research. 481 Stacy Drive, King of Prussia, Pennsylvania. Area code 215-265-2453.

**BSME 1947, Wayne State University. Eleven years experience in products, plant, and manufacturing engineering in the automotive industry. Four years product engineer on automatic cannon. Eight years systems project engineer in space craft mission and vehicle design. Five years forensic engineering experience in automotive and machine tool product liability litigation. 427 Dorothy Drive, King of Prussia, Penn. 215-265-4452.

determine any differences between this test vehicle and the 1963 production Corvair were minor and would not have influenced test results. The same comments apply to the 1960-62 Corvair except that these earlier models did not have the rebound travel limited to 7 and one half degrees, but permitted 11° of rebound travel.

Question 3

Based on these test results, would you have recommended the 1963 Corvair for production?

Answer

No. The vehicle, to meet what we believe is a reasonable standard of safety, must slide instead of rollingover on a flat road surface, with any combination of driver actions. The vehicle of run 120, representative of the 1963 Corvair, rolled over quite readily. In this test run a single hard right turn at 28 mph "caused the car to roll over onto its roof."

Question 4

Based on these test results would you have recommended the 1960-62 Corvair for production?

Answer

No. The 1960-62 Corvair probably was even more prone to rollover than the 1963, and was equally unacceptable.

Question 5

Would you have recommended any of the modifications already considered in these tests, or combinations thereof, for further testing before production?

Answer

Yes. Based on the tests as far as they go, we would have recommended as a minimum, the incorporation of rear shock absorbers incorporating rebound limiting and hydraulic cutoff as used in test run 73 of PG 15699. We would have recommended thorough preproduction testing of additional modifications, singly and in combination, baring in mind the objective of maximizing safety and consistent vehicle behavior in owner driving situations. Such testing modifications would have included:

a) Transverse leaf spring
b) Lowered rear axle pivot points (or other factors accounting for the improved rollover behavior with the overhung rear weights occurring in runs 127 through 131 of PG 17103).
c) Front anti-roll bar.

We also believe that a combination of front roll bar and rebound limiting known as RPO 696 (offered by GM as an extra cost option) should have been included in the testing program. RPO 696 was not included in the tests reported in the two PG reports but may have been tested at another time by General Motors.

Question 6

Do the rollover tests in PG 17103 and 15699 show that the Corvair differs from the behavior of other American cars with rigid rear axle?

Answer

The rigid rear axle 1961 full size four-door Chevrolet sedan was tested for 10 runs with no rollovers occurring even though every effort was

claimed to have been made to induce rollover while driving on a flat paved surface. This was done by turning the vehicle hard right, this being a J test. Sometimes this simple J turn was preceded by successive swerves to the left or right, this being a modified J turn test. Our considered opinion is that the rigid axle American car will skid rather than rollover when subjected to the J turn or to the modified J turn test. This is significant because these J turns subject the vehicle to one of the most severe maneuvers the driver can devise in order to determine which would occur: spin out or rollover. The results of this test enables the application of a simple yes or no criterion of rollover stability. The speed at which rollover occurs is of little significance. The crucial question is whether rollover occurs at all. In our opinion, it is far better to skid than to rollover under any foreseeable emergency circumstances.

Question 7

How does this behavior affect the safety of the driver or occupants?

Answer

Obviously, if a vehicle experiences a few horizontal turns as in a spin-out, this would cause no more trauma than an amusement park ride--providing there is room for a spin out--while a rollover on the other hand must necessarily cause severe damage to the vehicle and a high probability of severe injury to the occupants.

Question 8

Is there a difference between the 1960-63 Corvair and foreign vehicles in terms of rollover behavior?

Answer

These PG reports do not include tests of any foreign vehicles. Tests of rollover behavior are hazardous and expensive. We have not performed such tests nor are they reliably reported in the literature. To our knowledge GM has not made public any such tests it might have conducted. Therefore, no opinion is possible on this question.

Question 9

What is the estimate of the cost, to the manufacturer of modifying the rollover behavior of a 1960-1963 Corvair to make that vehicle perform comparably to other American cars with rigid rear axles, that is to make these vehicles skid or spin-out rather than roll over?

Answer

The minimum cost estimate is based on the answer to question no. 5 above, where we recommended incorporation of hydraulic cutoff rear shock absorbers in the proposed production vehicle. We estimate that the original cost to install these shocks as production components would have been less than $3.00 per car. The present day cost to retrofit the remaining cars with the same minimum fix is estimated to be approximately $20.00 today. The cost of testing the modified package which we recommended for verification of its suitability would be small when distributed over 500,000 cars. The limited test data contained in the two PG reports indicate that this would be a successful modification.

Question 10

In light of the results of PG reports 17103 and 15699, what are the minimum types of evidence which should be evaluated by an engineer in order to substantiate a conclusion that the 1960-63 Corvair is not defective under the provisions of the National Traffic and Motor Vehicle Safety Act of 1966 (that is, that its rollover tendencies could not be defined as a vehicle or equipment defect in performance, construction, components or materials)?

Answer

A conclusion that the 1960-63 Corvairs are not defective would require either a successful, credible and authoritative experimental contradiction of the two PG tests, or a credible demonstration that the criterion of no rollover on a flat road surface is overly conservative and unnecessary for assuring consumer safety.

While we know of no such tests and obviously cannot state the results of tests not yet performed or published, we predict that further testing would only confirm the results of PG 15699 and PG 17103 and our interpretation thereof.

An accepted principle of good product design is "fail safe." That is, if a failure does occur, a back up mode shall be available to the product user. Thus, if a car rolls over nothing except catastrophic destruction of the vehicle and probably death or serious injury to the occupants can occur. But if the car spins out of an emergency situation instead of rolling over, this "fail safe" performance characteristic at least offers the occupant the chance of no injury at all if there is room, as there often is on todays highways, for the spin to run its course. Furthermore, the very fact that the car's wheels are still on the pavement offers the driver at least the opportunity for him to attempt to regain control of the car if he can by pointing the front wheels in the skid direction. If successful, and again this depends on available area, then the car may be driven away from the near accident with ashen gray occupants the only result of the incident,

On the other hand, after the wheels leave the surface in the rollover, the driver can never regain control of his vehicle. That opportunity is denied him perhaps forever.

The chance for a safe spin out, the opportunity to regain control, and the reduction of injury if the upright spinning vehicle strikes an obstacle after dissipating some of its speed, are all provided in a vehicle that spins instead of rolls in an applicable emergency situation. Successful resistance to rollover on flat pavement is well within the state of the art for passenger cars, and has been for the last 20 years. Therefore, the criterion of spin out instead of rollover is valid and in its application to the Corvair has been too long delayed. In our opinion there is no convincing argument to the contrary.

Question 11

Does degradation of individual parts with age affect the rollover tendency of the Corvair?

Answer

Several types of degradation might occur. Tires and suspension bushings may deteriorate but their effects on rollover tendencies are unknown. The effect, if any, of shock absorber deterioration will be detrimental. Coil spring sag will reduce pivot point height and should therefore reduce the rollover tendency. In summary, we believe that the degradation of the various suspension components could probably have little net effect on the rollover characteristics of the Corvair.

Question 12

Based on your engineering expertise and the newly revealed technical data in PG 17103 and PG 15699, do you believed that the 1960-63 Corvairs should be recalled by the manufacturer and retrofitted to reduce rollover tendency?

Answer

Yes. The projected cost of this recall campaign is far less than the total projected future earnings of drivers and passengers otherwise fated to be killed or permanently incapacitated by rollover accidents as the current fleet of 1960-63 Corvairs runs out its useful life. This statement is based on accepted industry car use and life statistics. The fleet of 600,000 Corvairs in use today will number in the range of about 100,000 cars in 14 years. This level of usage will result in nearly 3,700,000 car years of driving from now until then. From this we may forecast the number of these cars which will cease their useful lives by a rollover accident resulting in death or loss of earning capacity.

To date a total of approximately 300 law suits have been filed against 1960-64 Corvairs where injured parties have alleged a defect in design or construction which led to an unnecessary loss of control or rollover or both. Of these, conservatively one half involved rollover. We would safely estimate that an absolute minimum of 1350 additional rollover accidents of equal severity have occurred since September 1959 involving this vehicle but were not suitable for court action because of such factors as contributory negligence, full coverage of losses by other negligent parties, lack of witnesses or other barriers or burdens. Our estimate of the total of rollover accidents is at least 1500. From established data we can show that these 1500 serious rollovers occurred in the course of 5,100,000 car years of use by the original 1,283,000 1960-63 and even including 196,000 1964 Corvairs, which is a rate of one serious rollover per 3150 car years (this is one accident per year among 3150 cars). Therefore, in the 3,700,000 car years remaining to the Corvair of this 1960-64 vintage now on the road, we would predict at least an additional 1087 rollovers resulting in serious injury or fatality.

If each of these projected future accidents causes, on the average, the loss to only one wage earner of half of this lifetime earnings and excluding any estimate as to property damage and medical expenses, the loss would be $160,000 for each of 1087 accidents, or a very minimal conservative total of $175 million. In contrast, the cost of the suggested recall and retrofit program is only $12 million at $20.00 per car.

Thus, the campaign has a benefit/cost ratio of about 14 to one, based on lost earning power alone, not to mention any allowance for medical expenses, property damage or human suffering by innocent parties. The accidents which will occur without the recall campaign are as certain as the turning of the earth.

APPENDIX III

Letter - Mr. Ralph Nader to Secretary of Transportation,

John A. Volpe, Dated February 23, 1971

February 23, 1971

Honorable John A. Volpe
Secretary of Transportation
Washington, D.C. 20591

Dear Secretary Volpe:

It has now been over five months since I sent you material concerning the relative instability of the 1960-63 Corvair automobile. Since the essence of my complaint was that the Corvair responds differently than all other American vehicles, and differently from rear engine vehicles such as the Volkswagen, I believe that the public is entitled to some substantial and quantifiable, if not precise, answers to these charges.

It is my belief that the National Highway Traffic Safety Administration has not yet conducted any tests of the Corvair which would reveal, as the suppressed General Motors Proving Ground reports reveal, the dangerously unique and quantitatively different response of the Corvair under transient or dynamic conditions compared to other vehicles. Without such test results (which are carefully avoided by the recent University of Michigan study [FH-11-7297] funded by the Department of Transportation) the Corvair's unique response has not been measured by the Department in comparison to other cars in terms of the lateral acceleration forces.

Of necessity, the issue of instability is one that must be answered by something other than a rationale which relies on the staged experimental tests by the party charged with manufacturing the defect. The government has accepted the principle that its own independent tests are necessary for ascertaining violations of food and drug regulations. Certainly the same principle applies here.

I would urge you strongly to act as quickly as possible to conduct the tests which are necessary to provide meaningful results which can serve the public. We know from the University of Michigan study that very sophisticated instrumentation has already been developed to test vehicle handling; moreover, other instrumentation such as for lateral acceleration is commonplace. In addition, so that there may be no burden, we will make available without charge a donated 1961 Corvair for your use in this regard.

The shocking fact that you are being asked by the NHTSA to issue a formal report stating that the 1960-63 Corvair has not been shown to be defective on the basis not of objective government tests but of armchair evaluation of General Motors public relations presentations and edited proving ground tests is another example in the long list of the Administration's special treatment of General Motors.

Dear Sec

The plain fact is that this so-called inquiry into the Corvair has been carried out under NHTSA practices and procedures which are clearly incomplete and as such are incompetent by any engineering standard. Such incompetence is reflected in the absence of any vehicle handling standards over four years after the passage of the Auto Safety Law. No such standards have even been proposed, thus insuring the status quo well into the 1974-75 period.

Moreover, statements by three handling engineers critical of the Corvair were submitted to you with the subsequent recommendation that the Safety Administration cross-examine these experts. This was not done, nor was there a substantive response to their received statements.

transien

You can perceive how these gaps in NHTSA competence and information are grossly irresponsible and unnecessary. Moreover, when the NHTSA then decides that no DOT testing is necessary to its evaluation of the Corvair, this amounts to engineering malpractice. It is time that the same standar of malpractice be applied to professionals inside government as can be done outside government.

somethin

Who in government is going to stand up for the victim of General Motor's negligence and obstinancy instead of taking the easy way of inaction or abdication? The struggle to bring accountability to General Motors over ice design and handling of the Corvair cannot be treated so contemptuously that no Department tests are to be conducted. Must the courts be availed of to require adherence to the minimal levels of investigating quality for such an important decision? Must the U.S. Congress be asked to investigate this engineering arrogance?

sophistica

I trust that before you make this decision, with its ramifications extending well beyond the instant subject matter as far as corporate deterrence is concerned, you will permit me an opportunity to meet with you Thank you.

Sincerely,

Ralph Nader

Ralph Nader

APPENDIX IV

Letter - Mr. Gary B. Sellers, a Ralph Nader Associate, to Mr. Rodolfo A. Diaz, Acting Associate Director, Motor Vehicle Programs, National Highway Traffic Safety Administration, Dated March 17, 1971

Mr. Rodolfo A. Diaz
Acting Associate Director
Motor Vehicle Programs
National Highway Traffic Safety Administration
Department of Transportation
Washington, D.C. 20590

17 March 1971

Dear Mr. Diaz:

This is in response to Secretary Volpe's agreement of March 9, 1971 with Ralph Nader, involving the National Highway Traffic Safety Administration's proposed testing of the Corvair. Mr. Nader has asked me to follow up on this matter and to state that he shares Secretary Volpe's and Mr. Toms' belief that fair and objective tests of the performance of the 1960-63 Corvair can be achieved by your Administration and that such tests should reveal whether the Corvair has unique response characteristics in comparison to other American vehicles. To that end, and in the interest of expeditious action, we request that NHTSA adopt a sequence of procedures which assures that your Administration achieves its goals within the limited budget available. In general, we suggest that the testing on these vehicles begin under conditions where the critical variables (such as high coefficient of friction, equal tire pressures, heavy weight load, etc.) are at the most severe levels--those most likely to reveal the defects alleged--or the differentials in the margin of safety present. If under these conditions, the Corvair does not respond in a dangerous fashion, at variance with the public's expectation of response, then the public can be content that the defects revealed in the GM proving ground reports are anomolous or mistaken. If, however, the Corvair performs unpredictably and dangerously in comparison to other American cars of similar size, then you would be justified in finding it defective.

We stress American cars in the above sentence because this is the public standard of expectation which GM set for itself and

the public in its public testimony under oath before the U.S. Senate, where GM said that 0.6g was the upper limit of control for all American passenger cars of that date (see page 1561 of Senate Hearings). The issue is to determine whether the vehicle is defective--not, as GM would prefer, to determine all the conditions under which it is not defective. Thus, testing which begins with all the variables at the least severe levels will be wasteful of the taxpayers' money and may also make a complete series testing unlikely for lack of funds. Starting with least severe tests would allow GM to assert after each that the vehicle is not representative of a production model.

Our more specific suggestions are:

1. That comparable vehicles tested include the 1960-63 Ford Falcon, the 1960-63 Plymouth Valiant, and the 1960-63 Corvair with the front stabilizer bar, and a 1965 or later model Corvair, and that each, as nearly as possible, have production suspension specifications and adequately operating components.

2. That the tests themselves begin with, and indeed confine themselves to, dynamic or transient maneuvers, such as the J-turn, or the hard hairpin turn, and S-turns, and other drastic accident avoidance maneuvers with braking in turns, and in movements from gravel to pavement. Since the GM data reveal, and our earlier presentation stresses, that most static tests (such as taking the Corvair at increased speeds around a fixed radius circle) document that the danger from an oversteering vehicle is that of going out of control end-for-end rather than straight ahead, we will accept these tests as not necessary to repeat.

3. That the above tests be conducted on the Corvair and other vehicles with equal tire pressures (26 lbs.) on all four tires. This is necessary since GM has stressed under oath that such variations from original specifications will make no significant difference, and indeed, that "even reversing the [prescribed] tire pressure differential is unrecognizable at 30-40 mph in a Corvair." (Senate Hearings, page 1561.) In any event, the original tire pressure recommendation for the Corvair, buried in the 1960-63 Owner's Guide, and merely stating the most minimal of information

in relation to front and rear pressure difference, has been eclipsed by repeated GM testimony as to how unimportant this was, and by the practice and expectation of today's owners or service station attendants on models of this early vintage.

4. That the skid number (effective coefficient of friction) of the surface used should be at the highest range found on the modern highway under dry conditions--since this surface will reveal the complete transitional response of the car most accurately.

5. That the vehicle also be tested with the maximum recommended load (such as the weight of four to six passengers), as might often be experienced on a Sunday drive. (Mrs. Collins had six people in her vehicle and luggage on the roof when her Corvair went out of control.)

6. That the car /be suitably equipped to measure acceleration and other relevant vehicle responses and that outriggers be provided to keep the vehicle from overturning.

As the above discussion indicates, the delineation of objective tests is certainly not a simple matter; however, since the above comments are not comprehensive, we believe that on-site observers offered by parties to this matter would greatly simplify and expedite the testing, resolve future technical interpretative questions (if asked to do so by NHTSA) and obviate unnecessary controversy at its conclusion. To that end, we will provide the services of Mr. Albert Fonda and Mr. Edward Heitzman, under any restrictions on their activities you deem appropriate, and we hope that you will allow GM also to have observers under similar conditions--since you have done so in the Kelsey Hayes wheel case, where a GM product was tested for another defect.

We believe the presence of observers is even more essential here, and would not constitute a burdensome precedent of any sort for NHTSA, because: (1) no objective standards for dynamic lateral stability testing have yet been set forth by the NHTSA; (2) because a passive observer allows total control of all procedures to be retained by you; (3) because the existence and revelation of the PG Reports in this case has placed the burden of proof on GM to

rebut the results of their tests; and (4) certainly because the large cost of testing makes it impossible for the public to duplicate your essential work.

We also request that all vehicles be supervised at all times, 24 hours per day, and that maintenance personnel provide you with affidavits to that effect at the conclusion of the testing.

We would like the opportunity to comment on your final test procedures before they are submitted to the contractor.

Sincerely,

Gary B. Sellers

cc: Ralph Nader

Edward Heitzman
#6, Moores Mill
Pennington, New Jersey 08534

Mr. Albert Fonda
King of Prussia, Pennsylvania

GBS:lsd

(The following information was referred to on p. 46:)

THE LIBRARY OF CONGRESS—CONGRESSIONAL RESEARCH SERVICE

COMPILATION OF STATE STATUTORY PROVISIONS PERTAINING TO SAFETY INSPECTION OF SCHOOL BUSES

[Prepared at the request of the Senate Labor and Public Welfare Committee]

By Albert M. Perry, Legislative Attorney, American Law Division—
October 20, 1972

CODE OF ALABAMA RECOMPILED

Title 36 § 58(33). Regulation relative to school buses.—The state board of education shall adopt minimum standards, not inconsistent with section 58(1) to 58(53), to govern the specifications of all new school buses purchased in the future and for the over-all operation of all school buses used for the transportation of school children when owned and operated by any school system or privately owned and operated under contract with any school system.

ALASKA STATUTES

Nothing found in index dealing with safety inspection of school buses.

ARIZONA REVISED STATUTES ANNOTATED

§ 28–984 ANNUAL INSPECTION REQUIRED OF SCHOOL BUSES

A. Each school bus registered in this state shall be inspected annually and an official certificate of inspection and approval shall be obtained annually for each vehicle in accordance with the provisions of this section. Such inspections shall be made and such certificates obtained with respect to the requirements for school buses as prescribed by law, and by regulations adopted by the commission and the state board of education as provided in § 28–900. Inspection of school buses shall be made during the months of June, July and August, except that a school bus, at the time it is initially registered in this state, shall be inspected at the time of its initial registration. The superintendent of the school district shall have all school buses that are registered by the district inspected within the prescribed periods. If a school bus is privately owned, the owner thereof shall have such bus inspected within the prescribed periods.

B. The commission shall, within sixty days after the effective date of this section, adopt and enforce rules and regulations not inconsistent with this section to provide for a minimum of one inspection annually.

ARKANSAS STATUTES ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

WEST'S ANNOTATED CALIFORNIA CODES, VEHICLE CODE

§ 2807 SCHOOL BUS INSPECTION

(a) The California Highway Patrol shall inspect every schoolbus at least once each school year to ascertain whether its construction, design, equipment, and color comply with all provisions of law.

(b) No person shall drive any schoolbus unless there is displayed therein a certificate issued by the California Highway Patrol stating that on a certain date, which shall be within 13 months of the date of operation, an authorized employee of the California Highway Patrol inspected the bus and found that on the date of inspection the bus complied with the applicable provisions of state law relating to construction, design, equipment, and color. The Commissioner of the California Highway Patrol shall provide by rule or regulation for the issuance and display of distinctive inspection certificates.

COLORADO REVISED STATUTES

No specific statutory provision dealing with safety inspection of school buses found.

CONNECTICUT GENERAL STATUTES ANNOTATED

§ 14–282A. INSPECTION DISTRICTS FOR SCHOOL BUSES

(a). The commissioner of motor vehicles shall establish eight inspection districts for the purpose of maintaining a system of continuing inspection of school buses, investigation of accidents involving school buses and investigation of complaints against owners and drivers of school buses, and to coordinate the various school bus safety programs.

DELAWARE CODE ANNOTATED

TITLE 21 § 2145 SCHOOL BUS INSPECTION

All school buses which transport pupils to any public, parochial or private school of this State shall receive a special inspection twice yearly at such time and place as specified by Department regulations. At such inspection each school bus shall be inspected by the Department to determine if it is safe and fit for operation and properly equipped, and a special check shall be accomplished with respect to specific school bus safety features in accordance with rules and regulations adopted by the Department.

WEST'S FLORIDA STATUTES ANNOTATED

§ 234.221 WITHDRAWAL FROM USE OF BUSES NOT MEETING REQUIREMENTS

The superintendent shall notify the school board of any school bus owned, leased, rented, or operated by the school board which does not meet all requirements of law and regulations of the state board, and the school board shall, if such school bus is in an unsafe condition, withdraw it from use as a school bus until the bus meets said requirements. The department of education may inspect or have inspected any school bus to determine whether the bus meets requirements of law and regulations of the state board. The department may, after due notice to a school board that any school bus does not meet certain requirements of law and regulations of the state board, rule that such bus shall be withdrawn from use as a school bus, this ruling to be effective forthwith or upon a date to be specified therein, whereupon the school board which owns, leases, rents, or operates said bus shall withdraw same from use as a school bus until the bus meets requirements of law and regulations of the state board and until the department has officially revoked its said ruling.

CODE OF GEORGIA ANNOTATED

No statutory provision dealing exclusively with school bus safety inspections found.

HAWAII REVISED STATUTES

No specific statutory provision dealing with safety inspection of school buses found.

IDAHO CODE

SEC. 33–1506 INSPECTION OF SCHOOL BUSES AND OTHER PASSENGER EQUIPMENT

All school buses shall at all times conform to the standards of construction prescribed therefor by the state board of education. Other passenger equipment shall at all times conform to any standards required by law, or regulations, for the operation of motor passenger vehicles.

Before any school bus or other passenger equipment is used for transporting pupils it shall be inspected by the state department of law enforcement, and if, upon inspection, it conforms to prescribed standards of construction, or such other standards prescribed by law or regulation, it may be used for transporting pupils; otherwise, no such school bus or other passenger equipment shall be used for that purpose.

Prior to the beginning of school in each school year, all school buses and other passenger equipment shall be similarly inspected before being placed in operation for that school year. The department of law enforcement shall file with the board of trustees its report of inspection of the school buses and other passenger equipment operated by the authority of the school district. At intervals of not to exceed sixty (60) days during the same school year the board of trustees shall cause

inspection to be made of all school buses and other passenger equipment operating under the authority of the board.

Whenever any school bus or other passenger equipment is found, upon inspection, to be deficient in any of the prescribed standards, or is found in any way to be unsafe or unfit for the transportation of pupils, such vehicle shall be withdrawn from service and shall not be returned to service until inspection shall show that the prescribed standards have been met or the vehicle otherwise is safe and fit.

SMITH-HURD ILLINOIS ANNOTATED STATUTES

TITLE 127 SEC. 49 POWERS OF DEPARTMENT OF TRANSPORTATION

* * * * * * *

The Department of Transportation has the powers enumerated in Sections 49.03 to 49.24, each inclusive.

* * * * * * *

SEC. 49.22 SAFETY INSPECTION OF MOTOR VEHICLES

To administer, exercise and enforce the rights, power and duties presently vested in the Department of Law Enforcement and the State Police under the "Illinois Vehicle Law," in the Illinois Commerce Commission, in the Superintendent of Public Instruction and in the Secretary of State under laws relating to the safety inspection of motor vehicles operated by common carriers, of school buses, and motor vehicles used in the transportation of school children . . .

BURNS INDIANA STATUTES ANNOTATED

SEC. 28–5131 ANNUAL INSPECTION OF ALL SCHOOL BUSES

The Indiana state police shall annually inspect all school buses, including school buses operated by any private school used for the transportation of school children, to determine whether the bus complies with the safety requirements prescribed for the construction and equipment of school buses in the official rules and regulations of the state school bus committee; and, upon inspection, if the bus is found to meet all such prescribed safety requirements, the inspecting officer shall issue a certificate to the owner of the bus stating thereon that the bus has been inspected and has been found to comply with the prescribed safety requirements. Such certificates shall be prepared in the manner as prescribed by the Indiana state police.

The bureau of motor vehicles shall not issue an annual registration plate for any school bus unless the owner of the bus, along with the application for registration, presents to the bureau a certificate, issued by the Indiana state police, stating thereon that the bus has been inspected and has been found to meet all prescribed safety requirements.

IOWA CODE ANNOTATED

SEC. 321.374 INSPECTION—SEAL OF APPROVAL

No vehicle shall be put into service as a school bus until it is given an original inspection to determine if it meets all legal and established uniform standards of construction for the protection of the health and safety of children to be transported. Vehicles which are approved shall be issued a seal of approval by the superintendent of public instruction. All vehicles used as school buses shall be given a safety inspection at least once a year. Buses passing the inspection shall be issued an inspection seal of approval by the superintendent of public instruction. The seal of original inspection and the annual seal of inspection shall be affixed to the lower right hand corner of the windshield.

KANSAS STATUTES ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

BALDWINS KENTUCKY REVISED STATUTES ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

85-820 O - 73 - 23

WEST'S LOUISIANA STATUTES ANNOTATED

(Through Cumulative Annual Report Pocket Par for Use in 1972)

No specific statutory provision dealing with safety inspection of school buses found.

MAINE REVISED STATUTES ANNOTATED

TITLE 29, SEC. 2011, SCHOOL BUSES; MARKINGS; STOP AT RAILROAD TRACKS

Notwithstanding § 2122 [biannual inspection of motor vehicles], every school bus as defined in this section shall be submitted to an official inspection station during the months of August and February for the purpose of complying with § 2122, concerning adjustment and sufficiency of the required equipment. This inspection shall be conducted by certain specified official inspection stations.

ANNOTATED CODE OF MARYLAND

Statutory provisions providing for semi annual inspection apparently repealed and statutes now authorize promulgation of regulations governing "the safe operation and design 'of school buses'." (See Art 66½ § 266 in up-to-date cumulative supplement.)

MASSACHUSETTS GENERAL LAWS ANNOTATED

CHAPTER 90 SEC. 7A PERIODIC INSPECTION OF MOTOR VEHICLES AND TRAILERS; SCHOOL BUSES; ISSUANCE OF WINDSHIELD STICKERS

The registrar shall include, in the rules and regulations prepared by him under section thirty-one, . . . rules and regulations providing for the inspection during the months of January, March, May, August and November in each year of school buses and of buses operated under a certificate, license or permit issued in accordance with the provisions of chapter one hundred and fifty-nine A which are used for the transportation of school children to and from school or in connection with school activities . . .

MICHIGAN COMPILED LAWS ANNOTATED

SEC. 340.594C SCHOOL BUS INSPECTION, TIME, INSPECTORS

§ 594c. The department of state police shall inspect each school bus annually and more frequently in those districts where bus defects have been found, to determine if the bus meets the specifications of the state board of education. The department of state police may delegate the inspection of school buses to publicly employed inspectors upon satisfying itself that the inspection complies with the provisions of this section.

MINNESOTA STATUTES ANNOTATED

SEC. 169.451 SCHOOL BUS INSPECTION

Subdivision 1. The Minnesota highway patrol shall inspect every school bus at least once each school year to ascertain whether its construction, design, equipment, and color comply with all provisions of law.

Subd. 2. No person shall drive, or no owner shall knowingly permit or cause to be driven, any school bus unless there is displayed thereon a certificate issued by the commissioner of public safety stating that on a certain date, which shall be within 13 months of the date of operation, a member of the Minnesota highway patrol inspected the bus and found that on the date of inspection the bus complied with the applicable provisions of state law relating to construction, design, equipment, and color. The commissioner of public safety shall provide by rule or regulation for the issuance and display of distinctive inspection certificates.

MISSISSIPPI CODE ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

VERNON'S ANNOTATED MISSOURI STATUTES (THROUGH CUMULATIVE ANNUAL POCKET PART FOR USE IN 1971–1972)

SEC. 307.375 SCHOOL BUSES, WHEN INSPECTED—ADDITIONAL ITEMS TO BE INSPECTED

The owner of every bus used to transport children to or from school in addition to any other inspection required by law shall submit the vehicle to an official inspection station, and obtain a certificate of inspection, sticker, seal or other device annually during the month of August or prior to operating the vehicle during the school year. The inspection shall, in addition to the inspection of the mechanism and equipment required for all motor vehicles under the provisions of sections 307.350 to 307.390, include an inspection to ascertain that the following items are correctly fitted, adjusted, and in good working condition:

(1) All mirrors, including crossview, inside, and outside;
(2) The front and rear warning flashers;
(3) The stop signal arm;
(4) The rear bumper to determine that it is flush with the bus so that hitching of rides cannot occur;
(5) The exhaust tailpipe to determine that it does not protrude from the bus;
(6) The emergency door to determine that it is unlocked and easily opened as required;
(7) The lettering and signing on the front, side, and rear of the bus;
(8) The service door;
(9) The step treads;
(10) The aisle mats or aisle runners;
(11) The emergency equipment which shall include as a minimum, a first aid kit, flares or fuses, and a fire extinguisher;
(12) The seats, including a determination that they are securely fastened to the floor;
(13) The emergency door buzzer;
(14) All handhold grips;
(15) The interior glazing of the bus.

REVISED CODES OF MONTANA

No specific statutory provision dealing with safety inspection of school buses found.

REVISED STATUTES OF NEBRASKA

79–488. Pupils; transportation; buses; inspection; correction of defects; violation; penalty. All boards of education in this state shall cause all school buses, whether owned by the district or not, to be inspected before school shall open in the fall and each eighty days during that part of the year when school is in session, by a qualified motor vehicle mechanic appointed by the board of education and approved by the county superintendent or district superintendent; *Provided*, that any bus that has been inspected under rules and regulations of the State Railway Commission shall be exempted from the provisions of this section. The mechanic shall thoroughly inspect every bus as to brakes, lights, windshield wipers, window glass, tires, doors, heaters, defrosting equipment, steering gear, and the mechanical condition of every part of such bus bearing upon the safety thereof as a means of transportation. Within five days after such inspection, the mechanic shall make a report of his inspection in writing on regular forms provided by the State Department of Education which shall show the work done, and file one copy of such report with the owner if other than the school district, and one copy with the board of education using such bus to transport pupils, and also file one copy with the county superintendent or district superintendent and the State Department of Education.

All such boards of education shall also cause such buses to be inspected at least twice during each calendar year by the Nebraska State Patrol. The Nebraska State Patrol shall thoroughly inspect every bus as to brakes, lights, windshield wipers, window glass, tires, doors, heaters, defrosting equipment, steering gear, and the mechanical condition of such bus bearing upon the safety thereof as a means of transportation. Within five days after such inspection, the Nebraska State Patrol shall make a report of its inspection in writing, and file one copy of such report with the board of education and file one copy with the State Department of Education. If any inspection required by the provisions of this section discloses any defect in equipment bearing upon the safety of a bus as a

means of transportation and the defect is not corrected within twenty-four hours after discovery, the bus shall immediately be removed from service until such defects are corrected to the satisfaction of a law enforcement officer. Failure to remove such bus from service shall constitute a misdemeanor, and, any person guilty thereof shall, upon conviction thereof, be punished by a fine of not less than ten nor more than one hundred dollars. Such conviction shall be grounds for dismissal of any employee.

Nevada Revised Statutes

§ 392.400 condition, equipment and specifications of vehicles used for pupil transportation; penalties

1. All vehicles used in the transportation of pupils shall be:

(a) In good condition and state of repair.

(b) Well equipped, and shall contain sufficient room and seats so that the driver and each pupil being transported shall have a seat inside the vehicle. Each pupil shall remain seated when the vehicle is in motion.

(c) Inspected semiannually by the department of motor vehicles to insure that such vehicles are mechanically safe and meet the minimum specifications established by the state board of education. The department of motor vehicles shall make written recommendations to the superintendent of schools of the school district wherein such vehicle is operating for the correction of any defects discovered thereby.

2. If the superintendent of schools fails or refuses to take appropriate action to have such defects corrected within 10 days after receiving notice thereof from the department of motor vehicles or the state department of education, he shall be guilty of a misdemeanor, and upon conviction thereof may be removed from office.

3. All vehicles used for transporting pupils shall meet the specifications determined by the state board of education.

4. Any person violating any of the requirements of this section shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than $50 nor more than $500, or by imprisonment in the county jail for not less than 15 days nor more than 6 months, or by both fine and imprisonment.

New Hampshire Revised Statutes Annotated

§ 203.27 inspection of

The director shall have authority, through his duly authorized agents, to inspect any motor vehicle used for the purpose of transporting school children to any school to determine its fitness for such purpose, and if he finds that such vehicle is unfit, he may refuse to permit it to be designated as a school bus. Said inspection shall be made before any motor vehicle transporting school children to any school is used for said transportation. The director shall cause to be issued some identification if such vehicle is approved as a school bus.

New Jersey Statutes Annotated

39:32–5. rules and regulations

The State Board of Education is hereby authorized to make rules and regulations not inconsistent with the provisions of this Title or any rule or regulation made pursuant thereto, concerning the construction, design, equipment, maintenance, operation and inspection of any bus subject to the provisions of section 1 of this act.[1] Such rules and regulations shall be filed with the Director of the Division of Motor Vehicles and, upon such filing, shall be enforced by the director in the same manner as all other rules and regulations made pursuant to this Title.

New Mexico Statutes Annotated

No specific statutory provisions dealing with safety inspection of school buses found.

McKinney's Consolidated Laws of New York Annotated

No specific statutory provisions dealing with safety inspections of school buses found.

GENERAL STATUTES OF NORTH CAROLINA

No specific statutory provision dealing with safety inspection of school buses found.

NORTH DAKOTA CENTURY CODE

No specific statutory provision dealing with safety inspection of school buses found.

PAGE'S OHIO REVISED CODE ANNOTATED

§451.761 SCHOOL BUS INSPECTION

The state highway patrol shall inspect every school bus to ascertain whether its construction, design, and equipment comply with the regulations adopted pursuant to section 4511.76 of the Revised Code and all other provisions of law.

The superintendent of the state highway patrol shall adopt a distinctive inspection decal not less than twelve inches in size, and bearing the date of the inspection, which shall be affixed to the outside surface of each side of each school bus which upon such inspection is found to comply with the regulations adopted pursuant to section 4511.76 of the Revised Code. The appearance of said decal shall be changed from year to year as to shape and color in order to provide easy visual inspection.

No person shall operate, nor shall any person being the owner thereof or having supervisory responsibility therefor permit the operation of, a school bus within this state unless there is displayed thereon the decals issued by the state highway patrol bearing a date of inspection prior to the fifteen day of October in the calendar year in which the decals were issued, except for a bus licensed by the department of highway safety pursuant to section 4511.763 [4511.76.3] of the Revised Code which shall display decals bearing a date of inspection between the sixteenth day of July and the first day of September of the calendar year in which the inspection was made, but if a bus is purchased after the first day of September it shall display decals bearing a date of inspection later than the date the bus is purchased and prior to the date of its use for the transportation of pupils.

OKLAHOMA STATUTES ANNOTATED

No specific statutory provisions dealing with safety inspection of school buses found.

OREGON REVISED STATUTES

No specific statutory provisions dealing with safety inspection of school buses found.

PURDON'S PENNSYLVANIA STATUTES ANNOTATED

TITLE 75 § 834 OFFICIAL INSPECTIONS

(i) The Secretary is hereby authorized and required to issue a certificate of school bus inspection for every vehicle owned by, or used under contract with, any school or school district which conforms with the provisions of this act and with the regulations of the State Council of Education. Such certificate shall bear the approval of and be countersigned by the Commissioner of the Pennsylvania State Police. This provision shall not apply to buses operated over regular routes in scheduled service under the authority of the Public Utility Commission.

(j) The owner of every vehicle which is to be used for the transportation of school children shall, in addition to any other inspection required by this act, submit such vehicle to the Pennsylvania State Police sometime during every August, or prior to operating such vehicle for the transportation of school children during the school year, to determine whether such vehicle conforms with the provisions of this act and the regulations of the State Council of Education. This provision shall not apply to buses operated over regular routes in scheduled service under the authority of the Public Utility Commission.

(k) No vehicle requiring a certificate of inspection under the provisions of subsection (j) of this section shall be operated without prominently displaying such certificate, as may be directed by the secretary, in addition to any other certificate now or hereafter required by law, on any of the highways of this Commonwealth.

GENERAL LAWS OF RHODE ISLAND

No specific statutory provisions dealing with safety inspection of school buses found.

CODE OF LAWS OF SOUTH CAROLINA

§ 21–819. INSPECTION OF BUSES

All school buses shall be subject to inspection at any time or place by officers of the State Highway Patrol or inspection forces. No school bus shall continue in operation in the transportation of pupils when found to be unsafe until the unsafe conditions disclosed by such inspection shall have been corrected.

SOUTH DAKOTA COMPLIED LAWS

§ 13–29–6

Annual inspection of school buses—Issuance and display of certificate—Operation in violation as misdemeanor.—Each vehicle used for the transportation of school children which is owned by a public school district or a private school or privately owned and operated under a contract with a school board or private school shall be checked at least annually by a representative of the division of highway patrol to see that such vehicle complies with state law, and rules and regulations of the state board of education, the department of motor vehicles and the division of highway patrol. A certificate certifying that such vehicle has successfully passed such inspection shall be issued by the division of highway patrol and shall be displayed in the vehicle above the windshield. Any person operating a motor vehicle in violation of this section shall be guilty of a misdemeanor.

TENNESSEE CODE ANNOTATED

§ 49–2211

Inspection of buses.—The state commissioner of education is hereby directed to have made not less than one (1) inspection annually of each school bus which transports school children, in order to determine whether it can be used safely to protect the lives of school children.

VERNON'S ANNOTATED STATUTES OF THE STATE OF TEXAS

No specific statutory provision dealing with safety inspection of school buses found.

UTAH CODE ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

VERMONT STATUTES ANNOTATED

No current provisions pertaining to inspection of school buses found. A thorough inspection "at an inspection station designated as such by the motor vehicle department as to its mechanical condition, standard equipment, and extra equipment and safety" was apparently repealed effective July 1, 1972 (see title 23 § 1282)

CODE OF VIRGINIA

No specific statutory provision dealing with safety inspection of school buses found.

REVISED CODE OF WASHINGTON

No specific statutory provision dealing with safety inspection of school buses found.

WEST VIRGINIA CODE

No specific statutory provision dealing with safety inspection of school buses found.

WESTS' WISCONSIN STATUTES ANNOTATED

No specific statutory provision dealing with safety inspection of school buses found.

WYOMING STATUTES

No specific statutory provision dealing with safety inspection of school buses found.

Requirements for the periodic inspection of motor vehicles generally, have been enacted in the following States:

Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Indiana, Kentucky, Louisiana, Maine, Massachusetts, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Texas, Utah, Vermont, Virginia, West Virginia, Wyoming.

(S) Albert M. Perry,
ALBERT M. PERRY,
Legislative Attorney.

EXHIBIT I

Mr. DAVID SMITH,
Editor, Ward's Auto World, Ward's Communications, Inc.,
Detroit, Michigan

DEAR MR. SMITH: In your editorial in the July, 1971 issue of Ward's Auto World "Better Never Than Late?", copy attached, you devoted seven paragraphs in defaming me and by implication criticized the management of the Ford Motor Company in your concluding paragraph when you said:

"It seems to us that all the political, legal, personal and other machinations of the Corvair controversy have obscured the central issue: If 1960–63 Corvairs were knowingly unsafe, too many people have kept quiet too long and too many other people have suffered as a result."

This criticism is not justified and is untrue as indicated in the attached documents and following facts:

1. *Attachment I.*—Copy of Wall Street Journal article dated Wednesday, July 8 1959, subject "Detroit's Big Three Already are Scrapping Over Their Small Cars" subtitled "Chrysler, Ford Suggest Auto with Rear Engine, such as GM's Corvair, is Unsafe". These warnings preceded the introduction of the Corvair by approximately three months.

2. *Attachment II.*—Copy of eight-page brochure prepared by the Chrysler Corporation in June, 1959, subject "The Advantages of Front-Engine Cars Over Rear-Engine Cars", referenced in Attachment I as follows:

"It comes as no surprise that Chrysler finds that rear-heavy cars are harder to control when driving on open highways. Rear engine cars tend to 'jack-up' dangerously when taking fast curves."

"Anyone wanting further 'proof' can send in a coupon from the ad and he'll receive an eight-page brochure showing the dire things Chrysler says can happen to someone driving a rear-engine car."

Quoting from the eight-page brochure as reproduced in Attachment II, Page 4:

"This 'high pivot' rear swing axle tends to develop an action on corners which raises the rear of the car above its normal straight ahead position. This is known as a 'jacking' action and seriously impairs stability because as the center of gravity moves upward, the effect of the centrifugal force makes the car body lean outward even more, increasing the weight on the outside tires. In a very fast turn, this can cause a car to tip over.

Because there is no high pivot swing axle on front-engine cars, they experience no jacking action on curves. Cornering is simpler and safer.

Note: There are some cars equipped with low, rather than high pivot rear swing axles. These cars perform admirably. However, of course, they are cars with front-mounted engines."

3. *Attachment III.*—Copy of article from Automotive News dated July 6, 1959, subject "Chevy Gives More Data on Rear-Engine Corvair". Quoting from this article:

"Olley, an internationally known expert on automobile suspensions, devoted much of his talk to how Chevrolet has overcome the natural tendency of rear engine cars to 'over-steer'—to turn toward the source of a side force.

Chevrolet engineers have achieved their desired margin of understeering (the preferable tendency of current front engine cars to turn away from the source of a side force) by the unusual device of using special tires and by recommending that 65% more air pressure can be maintained in the rear tires than in the front tires."

In fact, the 1959–63 Corvair under-steered up to about .3G but then reversed its normal handling characteristics to an over-steering condition. This over-steering characteristic was admitted by Mr. Frank Winchell of General Motors on Page 1562 of the "Federal Role in Traffic Safety Hearings Before the Subcommittee on Executive Re-organization of the Committee on Government Operations, The United States Senate 89th Congress, Second Session, Part IV March 22, 1966.

4. As a result of Ford engineering experimental work and product testing on the Corvair. the entire Ford dealer organization was advised in print prior to and during the 1960 model year:

"Front mounted engine provides greater stability and more familiar handling characteristics."

Additionally, some 4200 dealers were told in print prior to the 1960 model introduction:

"Engine up front gives better directional stability."

"On slippery roads or under hard braking, engine up front provides better control."

"Rear mounted engine critically demands uniform tire pressure for steering and maneuverability and to complicate this critical factor, front tire pressure on the Corvair is recommended at 16 lbs. and rear tire pressure at 28 lbs.—a 12 lb. variance."

Note: Success of the Falcon and/or failure of the Corvair during its first two model years when it outsold Corvair by nearly 75% (905,000 vs. 519,000) forced GM to introduce the Chevy II which was nearly a dead copy of the Falcon except for "cosmetic" appearance. After introduction of the Chevy II, as a 1962 model in the Fall of 1961, this car outsold the Corvair for the combined 1962–63 model years but was outsold by Falcon during the same period.

After GM saw the Falcon price, cost and sales appeal, they planned the Chevy II on a crash program with concomitant plans to drop the Corvair upon introduction of the Chevy II in the Fall 1961. The Chevy II was begun two months after introduction of the Falcon which was GM's "image car" for the Chevy II. Actual production Falcons were slightly modified for use on their development programs. However, in early 1960 GM announced the two-door Monza with bucket seats and because of aesthetic appeal the Monza greatly assisted Corvair sales to sufficiently cause reversal of their original plan to drop the Corvair when Chevy II was introduced.

5. The 1960 Corvair owners manual warned:

"Oversteer problems may also be encountered with incorrect tire pressures. Maintain the recommended inflation pressures on all tires." Also, "front and rear pressure difference is important to vehicle handling."

In summary, I think many have forgotten the facts cited above. Further, these documents are proof of the fierce, competitive nature of our business at that time. We did tell the public and history shows that the public listened and made their choices.

As regards the very direct defamation of my personal and professional integrity expressed in your July editorial, you should know that immediately after the Falcon went into production I was assigned responsibility for Ford Truck Engineering until June 1963, not even remotely related to Falcon Car Engineering. From June 1963 to June 1968 I resided in England. During that five-year period I was Director of Engineering, Ford of Britain, and later Director of Engineering, Ford of Europe. As such, I was neither informed of facts nor involved in work related to the Corvair controversy. Therefore, immediately upon hearing on the radio on May 28 the General Motors statement that the 1960–63 Corvair was "equal to or better than the limit of control of competitive cars of the same era", I devoted my energies to setting the record straight as expressed in my letter to Senator Magnuson (enclosed as Attachment IV).

I wrote my letter without knowing my legal rights and without expecting any support from my Company, the press, Ralph Nader, Senator Magnuson and his staff, or any force which might insure my job security. I was unware of the "temporary" protection afforded by law to those who submit important information to the Government relating to their deliberations and/or investigations. Further, in my first discussions with our management after sending the letter, I politely offered to resign, effective immediately, if they believed my personal letter would cause a serious Corporate problem. This offer was declined.

I would hope that my letter ot Senator Magnuson, its motives and consequences would be truthfully reported so that others could state the truth without fear of belittlement and defamation.

While it is possible that you didn't have enough facts, I expect you will at a minimum, correct the record in all the above matters with a public retraction in your column. I will make myself available as might be required to answer any questions resulting from this letter.

Sincerely,

HARLEY F. COPP.

BETTER NEVER THAN LATE?

Chevrolet began producing Corvair, its "revolutionary" new compact, in 1959. Over the first four model years—1960–63—more than 1.1 million Corvairs were built. About half of them are still operating on the nation's highways.

No car has ever proven to be more controversial. Ralph Nader has made a career of it. He catapulted into national attention by charging that the little rear-engine cars were unstable and tended to roll over because of a badly designed rear suspension system. More than that, Mr. Nader charged that GM knew the car was dangerous and could have corrected the problem by installing front stabilizer bars but failed to do so to keep costs down. GM installing the bars in the 1964 model year.

The question of whether GM really knew of Corvair's shortcomings and purposely produced potentially dangerous cars has never really been settled. GM executives denied Mr. Nader's charges in a Senate sub-committee hearing in March, 1966. Last fall Mr. Nader obtained secret GM test data which he claims proves Corvair was unstable without front stabilizer bars.

On the basis of this information the Department of Transportation is investigating handling and rollover characteristics of 1960–63 model Corvairs. And Sen. Abraham Ribicoff, the Connecticut Democrat, held hearings on the Corvair question in June before his sub-committee on executive reorganization.

THE "CORVAIR TEAM"

Even before Mr. Nader became prominent, GM was defending Corvair's stability in suits brought by owners. Through the years it has won some important cases and has lost others. Merely defending the car has gobbled up untold legal and engineering man-hours. A special "Corvair Team" at the GM Technical Center spends full time evaluating ways to defend GM's stance and to assure that the corporation doesn't get into a similar hassle with future models. Out of it all will likely come some major liability law precedents.

It has been nearly a dozen years since Corvair was introduced to the public. GM was working on the car seven years before that.

Perhaps the most amazing thing to come out of the ongoing Corvair controversy is that there are those who now say they knew all along the early models were unstable and unsafe.

They've kept this information from the public for a long time. And if they knew the car's shortcomings there must be hundreds of others who also knew. Why did it take them so long to speak up? How many persons have been injured or killed in accidents involving 1960–63 Corvairs that may have been unsafe?

One late blooming confessor, who claims his conscience has caught up with him after keeping quiet the past dozen years, is George Caramanna, a technician who left a $15,300 job at GM last year and now operates a service station in San Diego.

Mr. Caramanna says he worked on Corvair from the beginning as a member of Chevrolet's Research & Deleveopment Section.

No longer dependent on GM for his livelihood, Mr. Caramanna recently told *The Detroit Free Press:* "I knew it (Corvair) was a lousy car and so did a lot of other people I worked with . . . my only regret is that I didn't speak out sooner."

GM has steadfastly denied charges against 1960–63 Corvairs, saying they've been refuted by experts in courtroom testimony. But if Mr. Caramanna's tardy allegations *are* true, what has been the cost of his keeping quiet for the sake of job security?

Similarly, Harley F. Copp, director of engineering and technical services in Ford Motor Co.'s product development group, recently took it upon himself to come forth with details about early Corvairs tested by Ford. There had been prior references to the Ford tests, but Mr. Copp's letter in June to Sen. Warren G. Magnuson, the Washington Democrat and Senate Commerce Committee chairman, documented what actually happened.

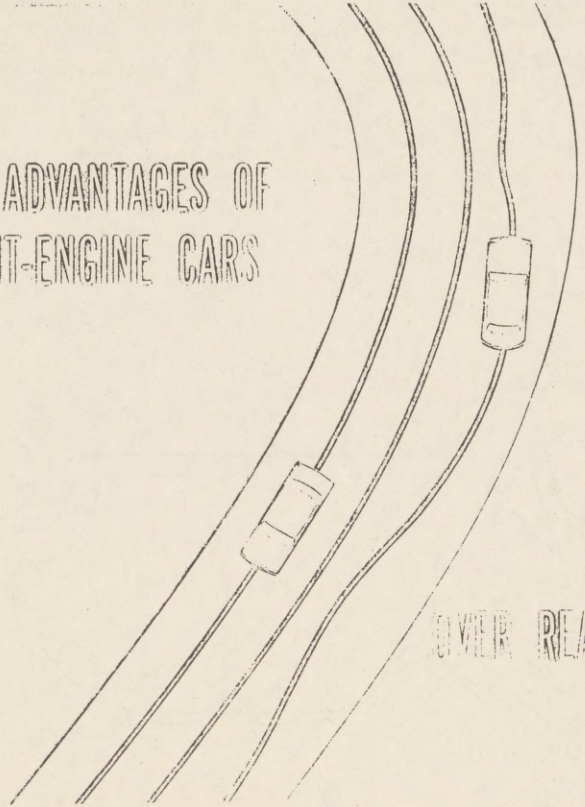
Acting on his own, Mr. Copp told Sen. Magnuson that three Corvairs rolled over in competitive tests made with Ford's compact Falcon. The roll-overs weren't due to error or driver abuse and surprised the Ford drivers, Mr. Copp said.

After the Copp letter was publicized, Ford volunteered to turn over its confidential test data on Corvair to Sen. Ribicoff's subcommittee—a move widely labelled as a sharp break in the industry's purportedly united front.

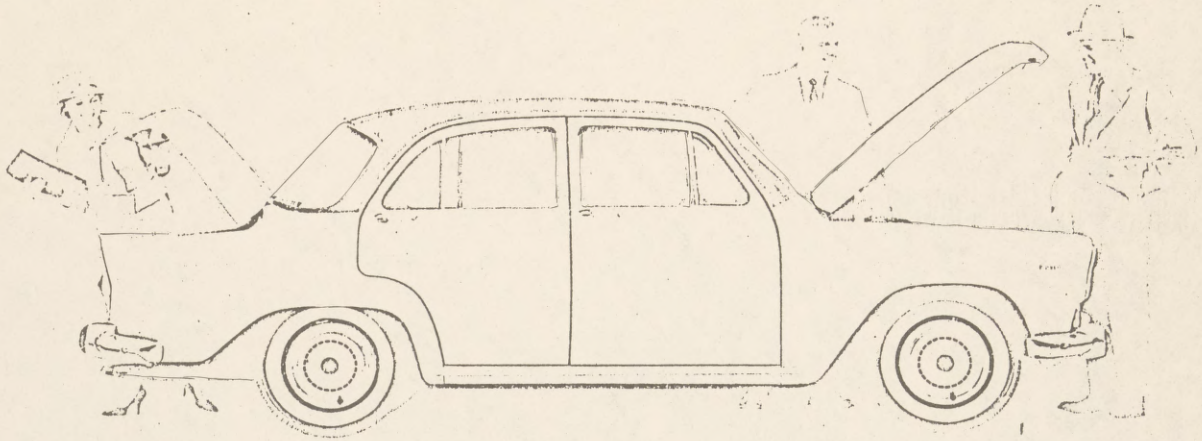
It seems to us that all the political, legal, personal and other machinations of the Corvair controversy have obscured the central issue: If 1960–63 Corvairs were knowingly unsafe, too many people have kept quiet too long and too many other people have suffered as a result.

ATTACHMENT II
June 1959

THE ADVANTAGES OF FRONT-ENGINE CARS



OVER REAR-ENGINE CARS



F O R E W O R D

There's a new kind of car buyer in America today. The kind that looks under the hood, asks a great many questions, reads the automotive publications and goes after the clear-cut facts. To the new kind of car buyer, a controversy has developed during the past few years. A controversy regarding engine placement.

It was only natural that such a controversy should arise, for engine placement has a strong effect on driving stability and handling characteristics. And these, in turn, determine the amount of pleasure an owner will derive from the operation of his automobile.

A great deal of research has gone into this subject. And this research has led to the conclusion that cars with front-mounted engines have definite advantages over cars with rear-mounted engines. This conclusion was based on irrefutable data, unequivocal facts.

SIMCA wants you to have the information about engine placement so that you can compare before you select a car in the economy import class.

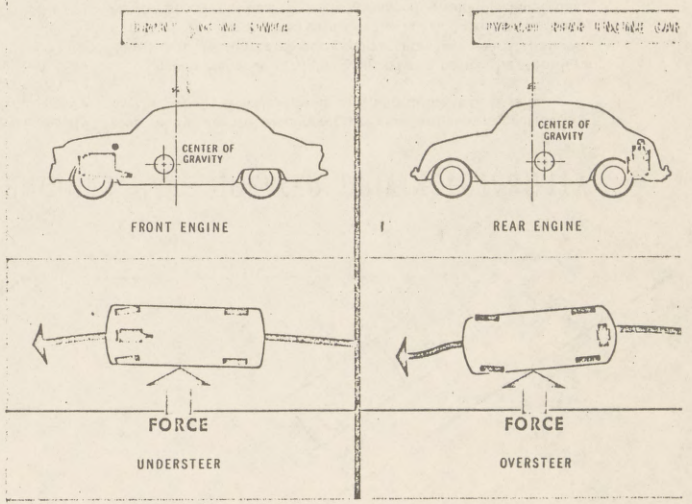
CARS WITH FRONT-MOUNTED ENGINES USUALLY HAVE BETTER BALANCE

In the more compact line of automobiles, the engine is the heaviest mass. And since passenger space is a prime requirement, the engine is placed at one extremity of the car or the other. This would lead one to believe that rear-engine cars are rear-heavy; front-engine cars, front-heavy. However, such is not always the case.

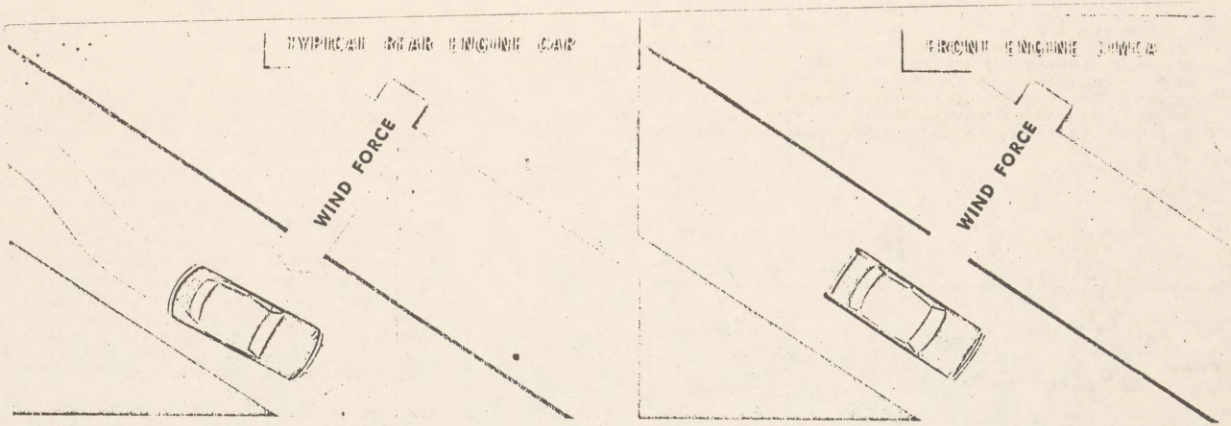
In the two leading economy imports with rear-placed engines, the engine is placed a bit *behind* the rear axle in the overhang. However, SIMCA's engine is placed *directly over* the front axle. This, in combination with other factors, gives SIMCA a desirable, slight front-heavy weight distribution, while the rear-engined cars have a rear imbalance.

The excess of weight in the rear-engined cars creates a situation known as "oversteering". Oversteering is exemplified by the reaction of a rear-heavy car to a cross-wind. At such a time, a rear-heavy car will curve with the wind, and the centrifugal force of this curved path will combine with the oversteering tendency to give rise to a self-generating disturbance known as instability. In rear-heavy cars, the driver must be continually on the alert to stabilize his car.

Cars with perfect horizontal balance and other desirable features, however, merely drift a bit in cross-winds, but do not change their direction. These cars tend to cancel the forces which oppose them.



Stability and good handling characteristics of a car depend largely on the way it reacts under the influence of side forces, such as are applied in a turn or by crosswinds. Under these conditions, the car will either understeer or oversteer. Front engine cars are designed to understeer, and the American driver finds this characteristic familiar and favorable. Rear engine cars oversteer; once the steering wheel has been turned to initiate the turn, the car seems to "take over" and steer itself. In some cars this effect is so pronounced that the driver must reverse the wheel to maintain the desired course.



CARS WITH FRONT-MOUNTED ENGINES HAVE GREATER DRIVING STABILITY

It has been made apparent that rear-heavy cars frequently have poor driving stability, while the desirable front-heavy cars have good stability. Instability in any car reduces driving safety. Not only are unstable cars difficult to drive, but they can conceivably get the driver into trouble.

All oversteer cars have a critical speed above which even the very best drivers cannot react fast enough to maintain control. The faster such a rear-heavy car is driven—the more dangerous the situation becomes for the driver. When such a car reaches its critical speed, the very slightest side force will be magnified by the centrifugal force due to the car's oversteer with such rapidity that the car will skid out of control before anything can be done. Even at speeds below the critical mark, rear-heavy cars will always require constant steering correction by the driver; therefore, making them difficult to handle.

Drive a SIMCA at highway speed and notice the stability. There will be fewer steering corrections necessary than on oversteering rear-engined cars. On the latter, to relax your grip on the steering wheel at highway speed would be dangerous.

In addition to the inherent instability of an oversteering rear-engine car, there is another disadvantage. American drivers are accustomed to the response of front-engine automobiles. An American driver in an oversteer rear-engine car might find, in a dangerous incident, that his driving actions would not result in a familiar and predictable reaction on the part of the vehicle.

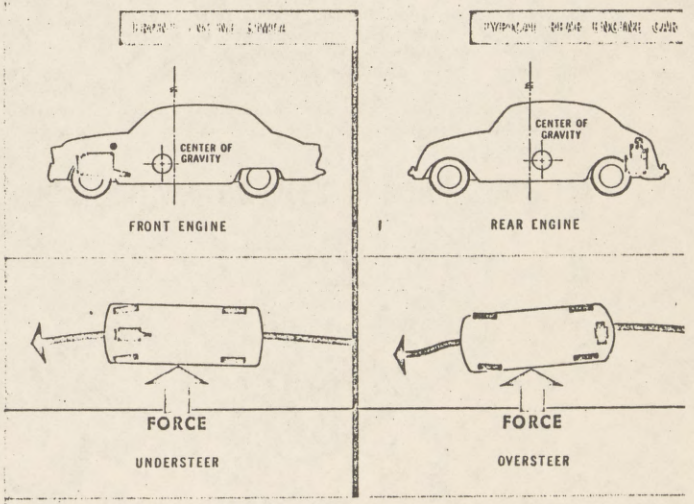
CARS WITH FRONT-MOUNTED ENGINES USUALLY HAVE BETTER BALANCE

In the more compact line of automobiles, the engine is the heaviest mass. And since passenger space is a prime requirement, the engine is placed at one extremity of the car or the other. This would lead one to believe that rear-engine cars are rear-heavy; front-engine cars, front-heavy. However, such is not always the case.

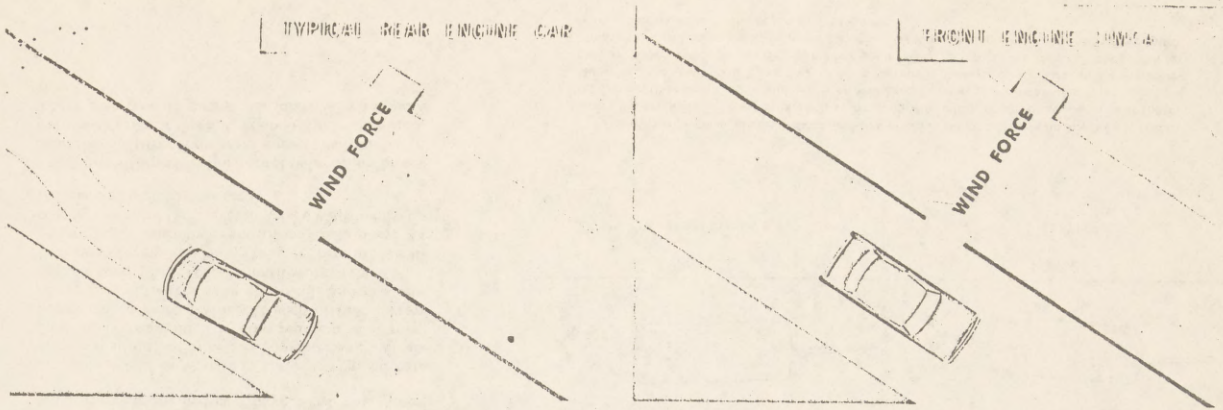
In the two leading economy imports with rear-placed engines, the engine is placed a bit *behind* the rear axle in the overhang. However, SIMCA's engine is placed *directly over* the front axle. This, in combination with other factors, gives SIMCA a desirable, slight front-heavy weight distribution, while the rear-engined cars have a rear imbalance.

The excess of weight in the rear-engined cars creates a situation known as "oversteering". Oversteering is exemplified by the reaction of a rear-heavy car to a cross-wind. At such a time, a rear-heavy car will curve with the wind, and the centrifugal force of this curved path will combine with the oversteering tendency to give rise to a self-generating disturbance known as instability. In rear-heavy cars, the driver must be continually on the alert to stabilize his car.

Cars with perfect horizontal balance and other desirable features, however, merely drift a bit in cross-winds, but do not change their direction. These cars tend to cancel the forces which oppose them.



Stability and good handling characteristics of a car depend largely on the way it reacts under the influence of side forces, such as are applied in a turn or by crosswinds. Under these conditions, the car will either understeer or oversteer. Front engine cars are designed to understeer, and the American driver finds this characteristic familiar and favorable. Rear engine cars oversteer; once the steering wheel has been turned to initiate the turn, the car seems to "take over" and steer itself. In some cars this effect is so pronounced that the driver must reverse the wheel to maintain the desired course.



CARS WITH FRONT-MOUNTED ENGINES HAVE GREATER DRIVING STABILITY

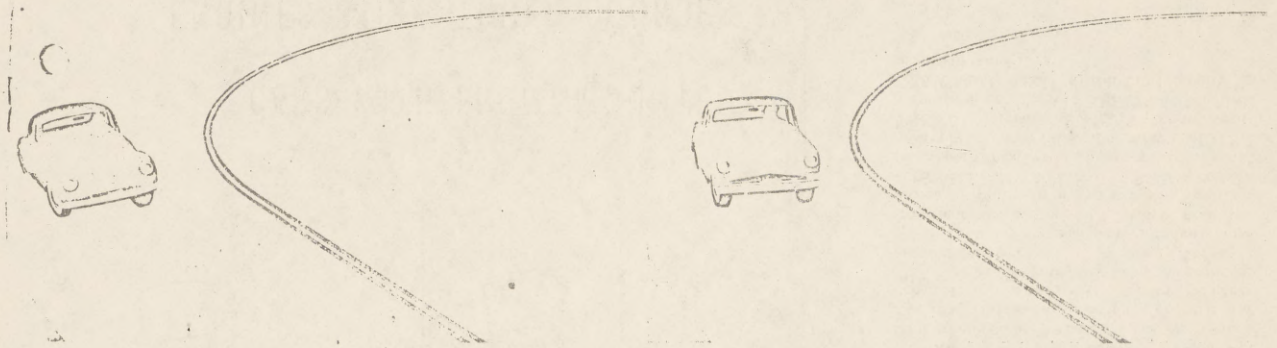
It has been made apparent that rear-heavy cars frequently have poor driving stability, while the desirable front-heavy cars have good stability. Instability in any car reduces driving safety. Not only are unstable cars difficult to drive, but they can conceivably get the driver into trouble.

All oversteer cars have a critical speed above which even the very best drivers cannot react fast enough to maintain control. The faster such a rear-heavy car is driven—the more dangerous the situation becomes for the driver. When such a car reaches its critical speed, the very slightest side force will be magnified by the centrifugal force due to the car's oversteer with such rapidity that the car will skid out of control before anything can be done. Even at speeds below the critical mark, rear-heavy cars will always require constant steering correction by the driver; therefore, making them difficult to handle.

Drive a SIMCA at highway speed and notice the stability. There will be fewer steering corrections necessary than on oversteering rear-engined cars. On the latter, to relax your grip on the steering wheel at highway speed would be dangerous.

In addition to the inherent instability of an oversteering rear-engine car, there is another disadvantage. American drivers are accustomed to the response of front-engine automobiles. An American driver in an oversteer rear-engine car might find, in a dangerous incident, that his driving actions would not result in a familiar and predictable reaction on the part of the vehicle.

85-820 O - 73 - 24



CORNERING IS BETTER WITH FRONT-ENGINE CARS

Of course, cars with the desired slightly front-heavy weight distribution will tend to behave better on curves. Rear-engine cars tend to lean and sway on curves due to their instability. Drivers of rear-heavy cars frequently find that on sharp curves, there are so many additional steering corrections, that "wheel-fight" becomes a problem. The stable car with its superior stability tends to stabilize itself on curves with a minimum of effort on the part of the driver.

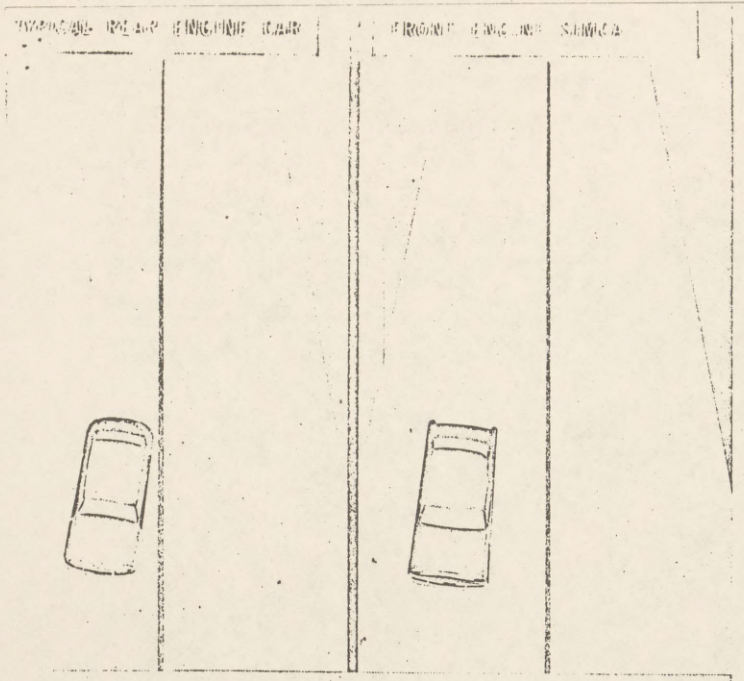
Then again, rear-heavy cars, when acted upon by cross-winds, road crowns or centrifugal force, tend to have trouble staying in their lane. This is called "wandering"—another hazard to driving.

Compact rear-engine cars commonly use a high pivot rear swing axle. The reasons being: because a rear-engine car usually has an independent rear suspension and because a high pivot rear swing axle is the simplest and most economical to make. Both the leading rear-engine imports use such an axle.

This "high pivot" rear swing axle tends to develop an action on corners which raises the rear of the car above its normal straight ahead position. This is known as a "jacking" action and seriously impairs stability because as the center of gravity moves upward, the effect of the centrifugal force makes the car body lean outward even more, increasing the weight on the outside tires. In a very fast turn, this can cause a car to tip over.

Because there is no high pivot swing axle on front-engine cars, they experience no jacking action on curves. Cornering is simpler and safer.

NOTE: There are some cars equipped with low, rather than high pivot rear swing axles. These cars perform admirably. However, of course, they are cars with front-mounted engines.



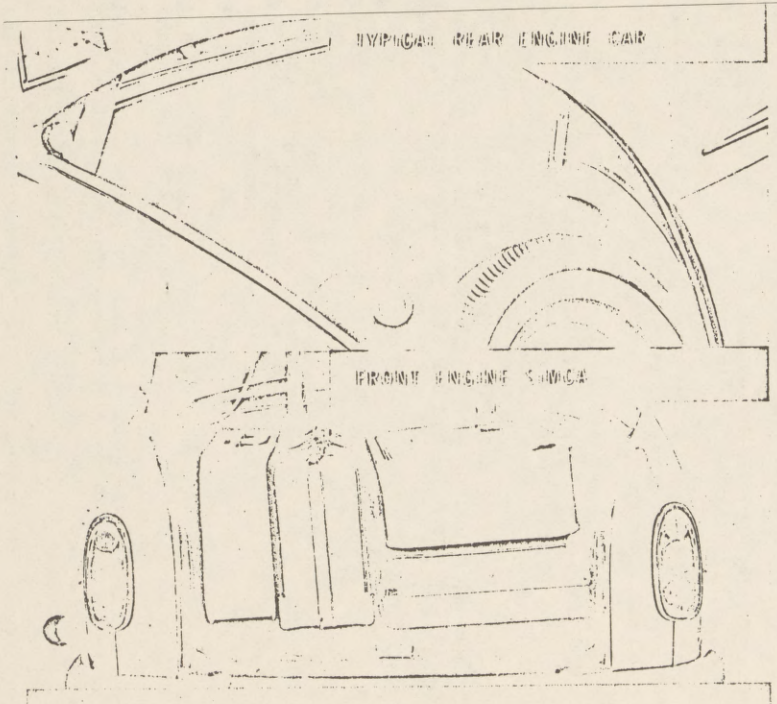
CARS WITH FRONT-MOUNTED ENGINES STEER TRUER COURSES

It has been mentioned that rear-heavy cars frequently have difficulty staying in their lanes. Front engine cars, with perfect weight distribution, steer a truer course. Why is this so?

Because of another factor, known as aerodynamic stability. The effects of side winds on automobile handling can make the difference between a restful journey and a very fatiguing one. A car which is aerodynamically stable is likely to be easier to drive in a cross-wind than one which is not stable. Because a rear-engine car is rear-heavy, the center of gravity is located further to the rear. When aerodynamic instability and inherent oversteer are combined in a car, as they frequently are in rear-engined vehicles, the result is a car which is tiring to drive on a long journey where cross-winds are encountered.

SIMCA, and other balanced automobiles tend to compensate for road crowns, cross-winds and road surface imperfections. There is less driver fatigue and greater driving pleasure. "Wheel-fight" is eliminated. Lean and sway are negated on curves.

Because of its near-perfect balance and front-mounted engine, SIMCA has been the object of praise from the experts. *SPORTS CARS ILLUSTRATED* said, "SIMCA corners like a first-rate sport-touring car . . . calmly and naturally . . . without lean or sway". *MOTOR TREND* commends SIMCA's "light, dead-accurate steering". And *SPEED AGE* added, "SIMCA's fantastic road-holding ability is second to none".



FRONT-ENGINE CARS HAVE MORE LUGGAGE AREA

Luggage space is easier to obtain in a front-engine car than a rear-engine car. In the former, the entire width of the tail can be devoted to space for luggage, and the engine snuggles between the front wheel houses in a small rectangular compartment. The rear-engine car wastes a lot of valuable space in the tail because the engine is not as wide as the car and, yet, luggage cannot be stacked around it. This leaves the narrow, rectangular front compartment for luggage.

There are a great many other comparisons to which front- and rear-engine cars may be subjected. Such as location of the gasoline tank, and the battery. It is desirous that the gas tank be elsewhere than in front of the passenger compartment. For in the event of collision, the gas tank in the front can cause gasoline to spill into the passenger compartment, creating great danger. One leading rear-engine car has its gas tank in the front. The other has it perilously close to the engine in the rear.

However, the main comparisons have been made. And the cards have been laid, bare-faced on the table. You be the judge.

ATTACHMENT I

[From the Wall Street Journal, Wednesday, July 8, 1959]

DETROIT'S BIG THREE ALREADY ARE SCRAPPING OVER THEIR SMALL CARS

CHRYSLER, FORD SUGGEST AUTO WITH REAR ENGINE, SUCH AS GM'S CORVAIR, IS UNSAFE

(By Everett Martin)

Four months before their small cars begin traveling down American highways, Detroit's automotive Big Three already are squabbling noisily.

A compelling reason exists for this unusual scrap. One Detroit engineer explains it this way:

Usually auto companies build basically the same kind of car; only a few engineering and styling features are different. In the small cars, however, one of the Big Three has gone in a "diametrically opposite direction."

The Ford Falcon and the Chrysler Valiant are conventionally designed with the usual water-cooled engine with cast-iron cylinder block mounted in front. The Chevrolet Corvair, on the other hand, has an air-cooled engine made mostly of lightweight aluminum and mounted in the rear.

KNOCKING THE CORVAIR

The advertising advantage of being dramatically different lies obviously with the Chevrolet. Ford and Chrysler, realizing this and fearing for the millions of dollars they've invested in their small cars, have set out to knock holes in the Corvair sales pitch before it is made to the public. Their tack has been to suggest to potential buyers that a car with its engine weight in the rear is so unstable on the road that drivers are in almost constant danger of skidding out of control.

Chevrolet, of course, hasn't been mentioned by name, but the General Motors division has become so alarmed over the potential of facing a public afraid to buy its car, that it called a special press conference the other day to discuss the advantages of a rear-engine car. Since the auto maker hasn't officially admitted that it is going to build such a car, its engineers had to talk about a hypothetical rear-engine car, remarkably like what the Corvair is expected to be.

Catching the backwash of the Ford and Chrysler assault are three of the hottest selling imports, Volkswagen, Renault and Fiat, which feature rear-engined cars.

STORY OF TWO ARROWS

Ford is attacking with a two-minute television film commercial depicting archers shooting two arrows—one weighted in the front and the other in the rear. The one with the weight forward travels true to the bullseye. The one with the rear weight wobbles uncertainly then misses the target by a considerable margin. A physicist. Professor Jonathan Karas, authoritatively explains the principles involved. The scene then switches to a Ford (front-engined) negotiating a tricky mountain road. By oblique reference the impression is left that a rear-engine car would probably end down in a canyon.

Chrysler uses the Simca car it imports from a French company, in which it owns a substantial interest, to bludgeon the Corvair. At the same time Simca is striking at its immediate rivals. Renault's Dauphine. Volkswagen and the rear-engined Fiat models. Chrysler president L. L. Colbert started the assault several weeks ago when he drawled at a New York press conference that his compact car "would have the engine up front where it belongs."

In the Simca advertisements, Chrysler asks in a bold headline: "Should a car's engine be in the front or in the rear?"

It comes as no surprise that Chrysler finds that: "Rear-heavy cars are harder to control when driving on open highways. Rear-engine cars tend to 'jack-up' dangerously when taking fast curves. Rear-engine cars generally have less luggage space than front-engine cars do." Anyone wanting further "proof" can send in a coupon from the ad and he'll receive an eight-page brochure showing the dire things Chrysler says can happen to someone driving a rear-engine car.

A PENDULUM

Briefly, the anti-rear engine camp claims that the weight of the engine in the rear is not sufficiently offset by weight of the passengers in front. This means, according to their contention, that when a rear-engine car goes around a high-speed curve or is hit from the side by a cross-wind the tendency is for the engine to act like a pendulum and swing the rear end of the car around ahead of the front end.

Chrysler claims that "to relay your grip on the steering wheel at highway speed would be dangerous" because "the very slightest side force will be magnified . . . with such rapidity that the car will skid out of control before anything can be done."

A conventional front-engine car has engine and passenger weight more evenly distribute on both axles so that the pendulum action canceled out, so the argument runs.

The pro-rear-engine camp concedes that instability was once a problem with their cars but they have solved it or they wouldn't be trying to sell them. Volkswagen, Renault and Fiat say that the wheelbases of their cars—all under 100 inches—are so short that they have achieved proper balance.

Since the Corvair will be a longer car—reports are that its wheelbase is 107 or 108 inches—the weight is less concentrated so balance is more critical. The hypothetical car discussed at the press conference by Maurice Olley, former director of research and development for Chevrolet, had 40% of its weight in the front and 60% in the rear. This is a safe distribution he says.

It can be achieved, he says, "by building an aircooled engine of light construction just back of the rear wheels with an integral aluminum transmission ahead of it." This, by coincidence, is exactly what the Corvair is expected to have.

An engineer at one of the other auto companies claims that the critical balance is 55% of the weight in the rear and 43% in front. He hints darkly that a rear-engine car isn't practical when the wheelbase gets more than 10 inches. "Look at Fiat," he says, "When they get into their larger models, they put the engine in front."

A Fiat spokesman, however, who limited his comments because he wants to confine the hassle as much as possible to Detroit, says that his company's older models are front engine, but in more recent models rear engines were used because they gave more effective interior space without a center hump.

Both Fiat and Volkswagen plan to ignore the anti-rear engine Detroit blasts. Renault, however, has already run some television commercials emphasizing the better traction rear engine cars have because the weight is concentrated over the rear drive wheels.

Says Renault's U.S. sales manager, Jack Kent, a former Chrysler man, "We're more appalled than concerned by the Ford and Chrysler claims. Rear engines are quite safe and quite advantageous." Renault is rushing into print with a brochure to give its dealer ammunition to counter the anti-rear-engine pitch.

[From Automotive News, July]

ATTACHMENT III

CHEVY GIVES MORE DATA ON REAR-ENGINE CORVAIR

(By Joseph M. Callahan)

How and why Chevrolet is going to build its rear-engine Corvair was explained to 40 newsmen here last week by Maurice Olley, who retired in 1955 as Chevrolet's director of research and development.

Although the Corvair will not be introduced for three months, Chevrolet deemed it necessary to stage this discussion about a "theoretical" car because of pre-introduction advertising bombardment against rear-engine cars by both Chrysler and Ford.

Some of this advertising has consisted of Ford Motor Co.'s TV commercial showing what happens when the weight of an arrow is transferred to the rear. Simca, Chrysler's imported car, has also joined the fray, by distributing a booklet on the "Advantages of Front Engine Cars."

Olley revealed for the first time officially a good many specifications about Chevrolet's light car, such as that it will have:

1. An aircooled aluminum engine; 2. An aluminum transmission housing; 3. Coil springs; 4. Individual rear swing axles; 5. An unloaded weight of about 2,400 pounds, (60 percent of which will be on the rear wheels).

6. 13-inch wheels; 7. A flat floor; 8. A low roof line; 9. Special long-cord tires; 10. A gas tank tucked behind the front suspension; 11. "Adequate" luggage space, and 12. A unitized body.

Olley, an internationally-known expert on automobile suspensions, devoted much of his talk to how Chevrolet has overcome the natural tendency of rear-engine cars to "oversteer"—to turn toward the source of a side force.

Chevrolet engineers have achieved their desired margin of understanding (the preferable tendency of current front-engine cars to turn away from the source of a side force) by the unusual device of using special tires and by recommending that 65 percent more air pressure be maintained in the rear tires than in the front tires.

Olley said that these two measures would satisfy the requirements for stable handling in this car by giving the rear wheels a "better sense of direction" than the front wheels. The recommended rear tire air pressure will be 26 pounds and the front tire pressure should be 15-to-16 pounds, he asserted. The tires will be identical on all four wheels.

The special tires now being manufactured by U.S. Rubber, will employ longer cords and have a longer cord angle. This will make the tires follow a straighter course, although they lose some of their "envelopment" or bouncing ability.

Declaring that there should be no doubt that a car with 60 percent of its weight on the rear wheels can be handled safely, Olley said that many station wagons and trucks have this type of weight distribution.

The wagons counteract it by putting more air in the rear tires and many trucks counteract it with dual wheels—both of these measures give the rear wheels the increased sense of direction that is needed, it was explained.

An important part of Chevrolet's solution to the matter of weight distribution is to have the weight of the payload (passengers and luggage) distributed in the same proportion on the front and rear wheels as the weight of the empty car is distributed.

Olley said that this car will be the most successfully-engineered rear engine car and that it will have the following advantages:

A. An improved, unitized body that is not weakened by a central tunnel or split in front to mount an engine. The body has none of the road or engine noise or shake in the front compartment so common in unitized bodies, he said.

B. Steering is light and precise, because of the lightly loaded front end.

C. The construction permits use of a flat, six-cylinder engine of about half the weight of existing V-8s. This engine would be too wide to fit between the front wheels. The engine, transmission and drive gears form one unit.

D. Water hoses, water pump, radiator, antifreeze and boiling are eliminated. The air-cooled engine reaches the ideal temperature two minutes after starting.

E. Since the engine is cooled by the fan only (not the motion of the vehicle), the power usually consumed by head resistances to force air under the hood is saved. The fan intake is controlled by a thermostat so that the correct amount of power is used for cooling.

F. The power plant is completely accessible for servicing. Said Olley, "It's like the Volkswagen—when you open up the rear end, all the machinery is sitting there smiling at you."

G. The front and rear brakes do an equal amount of work, giving maximum brake life and improved steering power. Although there is less weight on the front wheels, a car's weight partially transfers forward on stopping.

H. Traction on snow, ice, or soft roads is very good because of the added weight on the driving wheels and because the front wheels make a path for the rear wheels. He said a 40-to-60 weight distribution gives an increase of 33 percent in the maximum acceleration without slipping the rear wheels on any paved road.

I. The gas tank is removed from the exhaust system and is safe from front or rear collision. The entire fuel system is on the cool side of the engine, reducing fuel loss by evaporation and eliminating vapor lock.

J. Within the car there is a high degree of silence and coolness because there is no drive line or exhaust under the floor. Olley said Chevrolet was concerned about the normal tendency of an air-cooled car to be noisy, but this problem didn't materialize.

"Thanks to improved tires, improved supplies of aluminum and other technological advances, it is now possible to build a compact rear-engine car with American standards of comfort and performance," Olley said.

Explaining Chevrolet's thinking and the approach of its general manager, E. N. Cole, Olley added:

"In building a light car, it seemed desirable not to just shrink down dimensions, but that it was better to take a whole new approach. Novelty isn't enough. The major objection to a front-drive car is that it is dangerous on hills when unloaded."

In a reference to the competitive advertising, he said that to compare a car to an arrow is a complete fallacy, since the nearest comparison would be a car in which the steering had been completely disconnected.

EXHIBIT II

Design Study—Truck, Utility, ¼ Ton, 4x4, T122

IN ACCORDANCE WITH OCM 33521, OF JANUARY 4, 1951, CONTRACT NO. DA-20-018-ORD-11283

(By Ford Motor Company, Engineering Division, Special Military Vehicle Department)

H. F. Copp, Special Military Vehicles Engineer (Acting)—Ford Motor Company. Concur: E. S. MacPherson, Chief Engineer; Concur: D. Roeder, Executive Engineer, Commercial Vehicles Engineering Staff.

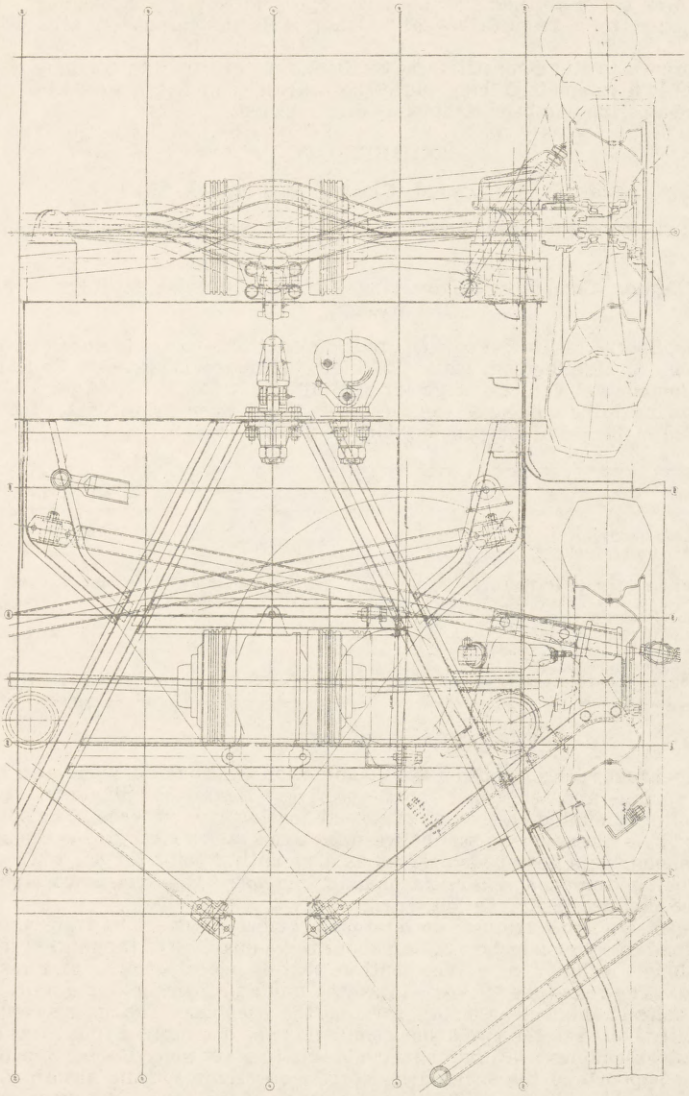
The following table compares the Design 2 Front Suspension data with the Design 1 and M–38 Front Suspension data at normal load.

	Design 2	Design 1	M–38
Load on front wheels (pounds)	1,305	1,114	1,446
Unsprung weight on front (pounds)	194	282	348
Tread on front (inches)	53	49	48.25
Maximum jounce—metal to metal (inches)	4.0	3.5	2.62
Maximum controlled rebound (inches)	4.0		
Wheel rate—in ride (pounds per inch)	155	198	264
Spring rate—in ride (pounds per inch)	450	180	240
Wheel frequency—in ride (cycles per minute)	99	130	133
Wheel rate—in roll (pounds per inch)	155	82	111
Roll rate of suspension (pound-feet per degree ton)	232	126.0	138.5

REAR SUSPENSION

The independent rear suspension is a combination trailing and swing-arm type using coil springs and telescopic shock absorbers, Figure 34. Single wishbone arms are solidly mounted on the hub of a semi-floating type of wheel. The spring is supported by a triangular gusset between the arms which strengthens the apex of the wishbone. This gusset also serves as a mounting point for the telescopic sock absorber acting in a sea-leg fashion to increase sway resistance. Jounce bumpers are mounted inside the coil springs.

Long suspension arms are used to minimize camber change. The front arm is the major load-carrying member, taking about three-quarters of the total vertical load. The longer tubular rear arm controls mainly wheel camber and resists lateral loads. The rear tube is pressed into the hub and forms a single unit. The front arm bolts to this sub-assembly, forming the wishbone. The spring support plate is finally bolted to the two arms, completing the assembly. Front arms and rear arm sub-assemblies are interchangeable left to right side. Rubber bushings at the inner supports of the swing arms correct misalignment and absorb shock loads. The same bushing assembly is used at each of the four inner arm joints.



FORD 1/4 TON 4X4
DESIGN 2 REAR SUSPENSION

FIGURE 34

RESTRICTED

FORD MOTOR COMPANY

Variable rate coil springs are used to improve ride under lightly loaded conditions and to reduce changes in wheel camber and vehicle load heights.

Driving and brake torque is transferred through the differential mounted to the body and frame structure, thereby greatly reducing the driving and braking loads in the suspension arms.

Advantages of the swing-arm type over other types of rear independent suspensions are:

1. Light weight.
2. Simple design.
3. Lower rear floor and increased ground clearance.
4. Increased cornering resistance.
5. Self-dampening characteristics under rapid vertical wheel movements.

The following tables summarize rear suspension design data:

CAMBER AND TRACK CHANGE

	Camber angle	Camber change per inch	Track	Track change per inch
At normal load	0°		53.0	
1-inch jounce	−2°-0′	2°	53.7	+0.7
2-inch jounce	−3°-58′	1°-58′	54.3	+.6
3-inch jounce	−5°-55′	1°-57′	54.9	+.6
4-inch jounce	−7°-51′	1°-56′	55.5	+.6
1-inch rebound	+2°-0′	2°	53.8	−.8
2-inch rebound	+4°-0′	2°	54.6	−.8
3-inch rebound	+6°-3′	2°-3′	55.5	−.9
4-inch rebound	+8°-8′	2°-5′	56.5	−1.0

COMPARATIVE REAR SUSPENSION DATA AT NORMAL LOAD

	Design 2	Design 1	M-38
Load on rear wheels (pounds)	1,635	1,716	1,984
Unsprung weight on rear (pounds)	195	267	340
Tread on rear (inches)	53	49	49
Maximum jounce M to M (inches)	4	3.88	3.68
Maximum controlled rebound (inches)	4		
Wheel rate—in ride (pounds per inch)	180	181.5	231
Spring rate—in ride (pounds per inch)	288	175	210
Wheel frequency—in ride—cycles per minute	94	95	99
Wheel rate in roll (pounds per inch)	180	138	93.6
Roll rate of suspension (pound-feet per degree ton)	268	210	120

COMBINED SUSPENSION DATA

	Design 2	Design 1	M-38
Total roll rate (front and rear)—Pounds per inch	500	336.0	258.5
Roll frequency—Cycles per minute	127	117.5	93.0
Overturning couple—Pound feet per degree ton	708	593.0	436.0

EXHIBIT III

Critique of General Motors Discussion on Design Characteristics of the Corvair

PAGES 1559–63 IN PART IV—FEDERAL ROLE IN TRAFFIC SAFETY

(By H. F. Copp)

Background

During my discussions with Senator Ribicoff's staff on June 14, 1971, Mr. John Koskinen and Mr. Robert Wager asked me to prepare a critique of General Motors Discussion on Design Characteristics of the Corvair authored by Mr. Frank Winchell and contained in Part IV—Federal Role in Traffic Safety dated March 22, 1966, beginning 6th paragraph on Page 1559, concluding 4th paragraph on Page 1663. These statements are submitted in accordance with the "Canons of Ethics for Engineers" in the Ford Motor Company.

My first knowledge of the General Motors statement contained in Part IV was on June 13, 1971. I was unaware of the degree of controversy because I was on assignment as Director of Engineering for Ford of Britain/Ford of Europe from June 1963 to May 1968. Therefore, since learning of these statements on June 13, I have studied in detail technology available to the automotive engineer prior to and during the design of the Corvair. I have also calculated relative values of Corvair vs. Volkswagen using formulae available at that time.

I stated in my letter to Senator Magnuson dated June 3, 1971, that we considered and discarded the rear engine configuration prior to selecting the front engine arrangement as the basic design for our Falcon which was the primary Corvair competitor. I also said in my letter to Senator Magnuson, "Rear engine cars, regardless of the rear suspension, exhibit borderline handling characteristics especially if the total weight of the vehicle exceeds 1800 lbs."

Discussion

G.M. begins and ends their statement with truthful representations of the manner in which we, as an industry, have developed the handling and control characteristics of our motor cars for at least 25 years. However, between their opening and closing statements I believe they sophistically mislead the layman on four major issues:

1. Corvair is No Different than Other Rear Engine Cars—Page 1560
2. Only Expert Drivers Can Handle More than .3 Lateral G—Page 1561
3. Corvair Tire Pressure Differential is of Minor Importance—Page 1561
4. Oversteer Might be Better than Understeer—Page 1562

Following is a summary of refutations which can be detailed and explained as might be required. Please note that references to my quantitative analysis of the Ford film showing comparative handling of Falcon and Corvair should be assumed to be accurate within ± 10%.

Summary of refutations

I. CORVAIR IS NO DIFFERENT THAN OTHER REAR ENGINE CARS—PAGE 1560

1. The Corvair was 40% heavier, larger and a greater load carrying car than the comparators. Because of the added weight and wheelbase, the Corvair's latent skidability was *twice* that of the Volkswagen. Again, because of weight and wheelbase is generated *1.8 times* the spin force once it began to skid.

2. The Corvair controverted established rear engine suspension effective roll couple distribution thereby grossly deteriorating its potential handling performance. The Volkswagen was basically an understeering vehicle whereas the Corvair was an under/oversteering vehicle. As an industry we design for understeer, avoid oversteer and consider under/oversteer a dangerous condition.

3. The films showing Falcon vs. Corvair handling submitted by Ford Motor Company clearly demonstrate the results of the above two deficiencies. Also, the Volkswagen and Renault Dauphine were run under similar circumstances in 1959 and were able to corner at *higher speeds* with *less instability* than the Corvair.

4. Compared to Volkswagen, the Corvair had 38% greater power to weight ratio and acceleration performance. Therefore, for safety purposes controllability performance should have been improved by at least the same amount compared to Volkswagen. And yet, their product showed quite the opposite results in controllability performance amounting to a gross deficit in the range of 70–90% compared to Volkswagen (38% plus a basic deficit of one-third to one-half lower controllability performance than Volkswagen).

II. ONLY EXPERT DRIVERS CAN HANDLE MORE THAN .3 LATERAL G—PAGE 1561

1. G.M. fails to mention that the conditions for which they speak are under smooth, ideal conditions wherein G forces felt by the driver are very nearly the same G forces on the tires at the road surface. In fact, under real world conditions the G forces felt by the driver are much less than G forces at the tire/road on typical undulating blacktop/concrete public roads. Real world tire to road lateral G forces cause incipient skid or slip which the average driver does not discern. Indeed, we as an industry, attempt to disguise these forces so that the customer may experience the pleasure of a plush ride.

This was especially the case for the Corvair and was proclaimed as a virtue. The high instantaneous lateral G forces causing incipient skid were so well dis-

guised that they stated as a result of their laboratory tests with "rear wheels in tramp motion at wheel hop frequency" (lateral forces as on rough road; 12–15 cycles per second):

"A 1957 Chevrolet (the last model Chevrolet produced with solid axle and leaf spring rear suspension) had 2.9 times more lateral axle motion, 1.4 times more lateral body/frame motion, and *six times more* lateral front seat frame motion compared to a Corvair with equal vertical wheel motions. Other presently produced vehicles with solid axles and leaf spring rear suspensions had similarly large lateral motions excited by this type of suspension." (Emphasis added.)

Therefore, a highly idealized lateral G force suspension system has no relevance if these values cannot be translated into competitive handling on public roads as stated in the last paragraph of G.M.'s discussion:

"A car having a high capability in lateral acceleration may be completely inadequate in the transitional phase of entering or leaving a curve, or in an S maneuver, or in passing, or in turning while braking or accelerating, or in low coefficient pavements."

2. Drivers encounter roads having friction coefficients as low as .10 and many times the coefficients will change from .30 to .10 or even .70 to .10 without warning. Examples are: wet leaves on wet/dry concrete; early morning frost patches.

3. A primary automotive engineering objective is to prevent loss of control resulting from inadequate suspension system warning and/or unpredictable suspension system response. Roll-over is only one possible result of loss of control. The use of idealized lateral G values has no relevance to the primary objective of developing real world suspension systems if the basic system is not in accord with G.M.'s opening and closing statements.

4. The films showing Falcon vs. Corvair handling and my analysis of these films clearly demonstrate that an expert driver was unable to control the Corvair in a normal highway handling test of .32 G where the test was run on dry, sightly undulating blacktop. The films and the analysis are visual proof of the fallacy in playing "a numbers game" with lateral G. During the five highway handling sequences shown in the Ford film, the Falcon achieved a 100% rating whereas the Corvair achieved only a 10% rating and yet General Motors emphasizes that the Corvair was capable of higher lateral G than other front engine cars.

III. CORVAIR TIRE PRESSURE DIFFERENTIAL IS OF MINOR IMPORTANCE—PAGE 1561

1. From my analysis of the Ford film comparing Falcon vs. Corvair handling, I quote:

"For non-standard tire pressure of 26–26 psi severe control problems began upon *entering* the second corner of the S curve in Phase II highway handling whereas similar control problems with standard tire pressure began on *leaving* the second corner of the S curve. The amounts to a 6-second reduction in 'on course' control which translates to an approximate 33% deterioration for 26–26 psi tire pressure."

These tests were run at 31 mph and yet the General Motors statement says:

"However even reversing the tire pressure differential is unrecognizable at 30–40 mph in a Corvair."

2. G.M. publicly stated in March 1960 when discussing the development of the Corvair suspension system:

"The objective was to arrive at equal tire deflections, front and rear, under riding conditions and *equal slip angles*, front and rear *during cornering*. At 5-passenger load the difference in tire deflection is less than .10 inch. (Emphasis added because slip angle induces understeer.)

"There are two things that could have been done to better this condition. One would be to lower front tire pressures to 13 psi or increase rear tire pressure to 28 psi." Also ("Thus, in line with our original objective an engineering solution to lateral stability has been obtained by proper design of tires, rims and *specific inflation pressures*." (Emphasis added.)

3. G.M. also stated on July 1, 1959 in a pre-introduction press review:

"*With the proper tire inflation* and with the assistance of independent suspension in front and a swing axle at the rear, we have produced *the desired margin of understeer*." (Emphasis added.)

4. Technically, it has been calculated within ± 10% at 35 mph that equalizing front and rear tire pressure causes a 60% deterioration in steady state response for an understeering rear engine car with driver only and an 80% deterio-

ration at full passenger load. For the Volkswagen, which was a much better handling vehicle than the Corvair, the affect of equalizing front and rear tire pressure caused a 60% deterioration in vehicle response at 35 mph with driver only.

IV. OVERSTEER MIGHT BE BETTER THAN UNDERSTEER—PAGE 1562

1. The General Motors statement suggests that oversteering cars might be safer because they would spin into the corner rather than into the oncoming lane. In fact, the Ford film analysis shows that when oversteer was increased on the Corvair by increasing front tire pressure the first swerve or deviation in loss of control threw the Corvair into the oncoming lane during all three test sequences and these tests were run with an expert driver.

2. The analysis of the Ford films showing Falcon vs. Corvair handling proves that in the important highway handling sequences the understeering Falcon achieved a 100% rating and the under/oversteering Corvair achieved a 10% rating running at 31 mph and .32 G.

3. The film analysis also shows that during all five sequences of the highway handling test runs the Corvair deviated into the oncoming lane during each test sequence and that complete loss of control was experienced in three of the five sequences.

4. The Ford film analysis indicates that increasing oversteer by equalizing the tire pressure on the Corvair caused an approximate 33% deterioration in controlability.

5. Historical industry practice is to design our motor cars for understeer because it is more uni-directional and provides the basis for warning and quicker response by the driver. Technical literature published by General Motors for years proves that they design for understeer to achieve favorable vehicle stability criteria. I quote from the G.M. press review of July 1, 1959 on the Corvair:

"There are two requirements for stable handling and it is difficult to say which is the more important. One is that the rear tires must not be overloaded. If they are, the car will wander whatever its other conditions might be. The other is that *the sense of direction of the rear wheels should be slightly better than the front. This gives the desired margin of understeer.*" (Emphasis added.)

6. The major reason for specifying the large tire pressure differential on the Corvair was to induce understeer as stated in their owners manual.

Conclusion

I conclude that apart from opening and closing statements by General Motors in their Discussion on Design Characteristics of the Corvair, their main arguments consist of incongruous artifices which mislead the layman by clever omission of published knowledge and facts known to them prior to and following introduction of the Corvair in October 1959. Application of these artifices to the design of our motor cars would result in disastrous controlability and by comparison the 1959–63 Corvair control problems would pale to insignificance. Furthermore, I believe that the four central issues contained within the G.M. statement as described above would not have been accepted, if submitted, for presentation or publication by the Society of Automotive Engineers or any other reputable automotive engineering fraternity.

Finally, I must say that in my 25 years of designing and developing motor cars I have never had submitted to me data or a technical report arguing in favor of even one of the four major issues which I have proscribed in the G.M. statement on Design Characteristics of the Corvair:

1. Larger, heavier and more powerful rear engine cars are no different than the smaller Volkswagen, Renault Dauphines.

2. Only expert drivers can handle more than .3 lateral G.

3. Tire pressure differential has little or no effect on rear engine car handling between 30 to 40 mph.

4. Oversteer might be better/safer than understeer.

EXHIBIT IV

Summary—Analysis of Ford Film Showing Falcon vs. Corvair Handling

(By H. F. Copp)

BACKGROUND

While preparing my letter to Senator Magnuson dated June 3, 1971, I discovered the only extant copy of a film made on the Ford Motor Company Dearborn Proving Grounds in August–September 1959 indicating the serious handling deficiencies of the 1960 Corvair. This film was made at the request of Mr. J. O. Wright then Vice President and General Manager of the Ford Division and was subsequently shown to the Fort Technical Evaluation Committee on September 23, 1959, and October 1, 1959 to the Executive Committee which was, at that time, the Corporate Operating Committee and included Mr. Henry Ford II, Mr. E. R. Breech, Group Vice Presidents, etc.

During my discussions with Senator Ribicoff's staff and specifically Mr. John Koskinen and Mr. Robert Wager, I was asked to analyze this film and quantify the relative handling characteristics of the Corvair as run in the tandem test sequences with the Falcon. The attached analysis and this summary are submitted in accordance with the "Canons of Ethics for Engineers" in the Ford Motor Company.

DISCUSSION

Following my testimony to Mr. Koskinen and Mr. Wager in Washington on June 14, additional documents were discovered and submitted to the Ford Corporate Office of General Counsel from which important statements relating to the film and Corvair handling evaluations as presented to the Executive Committee on October 1, 1959 are quoted below:

1. Before showing the film:

"It is necessary to emphasize at this point that these are completely objective tests and in no sense have they been contrived to show the Corvair in an unfavorable light. The drivers of both cars are equally skilled drivers from our test track area, and the Corvair driver was instructed to make every effort to keep his car under control."

2. After showing the film:

"The lack of extreme cornering ability is not a significant product disadvantage in itself. Of much greater significance in the preceding film has been the difficulty experienced by the Corvair driver in re-establishing control over his vehicle once it had been lost. This is indicative of a lack of stability which is more likely to be encountered by the average driver under average conditions and this condition is deemed to be a significant product disadvantage."

3. In the discussion on Ride and Handling:

"The Corvair with its rear heavy weight distribution shows marked instability under conditions of severe cornering and in passing. While the driver will not encounter difficulty under most normal driving conditions, there are frequently encountered emergency conditions such as slippery pavement or emergency maneuvering in which the driver cannot maintain control of the vehicle. The Corvair falls considerably short of our handling standards."

Although during my investigations and subsequent searching we were unable to discover an additional film which showed the Volkswagen and Renault Dauphine running against the Falcon, it is important to note that during the Executive Committee presentation on October 1, 1959 we stated:

"For reference purposes, we have also shown the Volkswagen and the Renault Dauphine under similar circumstances at comparable speeds. These pictures show that both of these vehicles have ability to corner at higher speeds with less instability than the Corvair."

METHOD OF ANALYSIS

The film shows 10 sequences run at specified tire pressures: 5 sequences at 30 mph, .40 G, on a 150 ft. radius circle referred to as "Phase I—Comparative Breakaway"; 5 sequences (of much greater significance) at 31 mph, .32 G, on an "S" curve of approximately 200 ft. radii with a 100 ft. inter-connection between the two curves referred to as "Phase II—Comparative Highway Handling". Nine additional sequences were run with the Corvair at equal tire pressure, front and rear, of 26 psi.

A numerical percentage summary has been calculated by assigning declining percentage ratings to control performance for the categories of: stable, minor, major, and lost. Each film sequence was analyzed and graded into these four categories and then translated into percentage ratings to develop an average for each of the two phases. All results including speed, G forces and percentage ratings can be assumed to be accurate within ± 10%.

RESULTS AT SPECIFIED TIRE PRESSURES

1. The Corvair achieved a 35% control rating during the "Phase I—Comparative Breakaway" tests as compared to the Falcon which achieved 100%.
2. The Corvair achieved only a 10% control rating during the "Phase II—Comparative Highway Handling" tests as compared to the Falcon which achieved 100%.
3. The average of the Phase I and Phase II testing was 18% compared to the Falcon at 100%.
4. An absolute minimum acceptance standard of 60% should have been achieved for the average of the two types of tests but the Corvair achieved less than one-third of this minimum; 18% vs. 60%. Significantly, the standards of General Motors appear to be even higher as stated by Mr. Frank Winchell on Page 1560 of Part IV, Federal Role in Traffic Safety dated March 22, 1966. I quote:

"Much of our testing, therefore, is comparative; acceptability is based on comparison with successful vehicles in use by the motorist on public road systems."

Note: I have also been asked to provide a critique of G.M.'s statement referenced in Point 4 above under Results. There is a direct relationship between my film analysis and my critique because, as noted above, G.M. fully understands that handling evaluation is comparative and I, therefore, reference my film analysis in the critique of G.M.'s statements.

FALCON VS. CORVAIR HANDLING

FILM ANALYSIS QUANTIFICATION OF HANDLING COMPARISONS

The film showing the Falcon vs. Corvair handling comparison submitted by the Ford Motor Company to the United States Senate has been analyzed at the request of Messrs. Koskinen and Wager. This film was made by the Ford Motor Company on the Dearborn Proving Grounds during August-September, 1959, prior to introduction of these two cars and at the request of Mr. J. O. Wright then Vice President and General Manager of the Ford Division, for the purpose of illustrating the serious Corvair handling problems which we had discovered during our early evaluations.

The film was shown to the Corporate Technical Evaluation Committee on September 23, 1959 and on October 1, 1959 to the Executive Committee of the Ford Motor Company. To my knowledge, this is the first and only time a comparative handling movie has been made to demonstrate to Corporate management a competitor's handling characteristics.

We said to the Ford Executive Committee when presenting this film:

"The Corvair has been shown attempting to maintain the same speed as the Falcon in the various maneuvers. It is necessary to emphasize at this point that these are completely objective tests and in no sense have they been contrived to show the Corvair in an unfavorable light. The drivers of both cars are equally skilled drivers from our test track area, and the Corvair driver was instructed to make every effort to keep his car under control.

For reference purposes, we have also shown the Volkswagen and the Renault Dauphine under similar circumstances at comparable speeds. These pictures show that both of these vehicles have ability to corner at higher speeds with less instability than the Corvair.

(Film.)

DISCUSSION OF HANDLING FILM

These pictures have shown only that the Corvair exhibited instability under extreme cornering conditions, under which the Falcon remained stable. The lack of extreme cornering ability is not a significant product disadvantage in itself. Of much greater significance in the preceding film has been the difficulty experienced by the Corvair driver in re-establishing control over his vehicle once it had been lost. This is indicative of a lack of stability which is more likely to be encountered by the average driver under average conditions and this condition is deemed to be a significant product disadvantage."

We also said in the same presentation:

"The handling and stability of the Falcon were excellent. The Convair with its rear heavy weight distribution shows marked instability under conditions of severe cornering and in passing. While the driver will not encounter difficulty under most normal driving conditions, there are frequently encountered emergency conditions such as slippery pavement or emergency maneuvering in which the driver cannot maintain control of the vehicle. The Corvair falls considerably short of our handling standards."

There are innumerable methods of analyzing comparative handling characteristics shown in the film. In the final analysis, results must provide "go"-"no go" quantification of handling characteristics. In this instance, a typical method has been used to assess the control adequacy of the Corvair relative to the Falcon as shown in the Attachment; viz,

First, the severity of control deviation was defined in terms of four categories; stable, minor, major, lost (Attachment p. 1).

Second, control adequacy percentage within a range of ±10% was assigned to each of the above four severity ratings (Attachment p. 1).

Third, all test runs in the film were analyzed. Severity ratings were assigned and the sequence of control deviation was noted in terms of oncoming lane and/or adjacent shoulder (Attachment pp. 2–3).

Fourth, the percent control adequacy within a range of ±10% was assigned for each test run based on the above (Attachment pp. 2–3).

Fifth, an average performance of 60% control adequacy was established as the minimum acceptance standard.

In summary, a method has been evolved which provides quantification of control adequacy in terms of percentage relative to the Falcon but only for the conditions of dry, blacktop, slightly undulating surfaces. It should be emphasized that fully definitive comparisons would require similar tests under many more adverse conditions, such as wet blacktop, curves with changing road camber, surprise bumps on cornering which tend to throw the vehicle, ice, snow, etc.

The film analysis is summarized as follows and detailed on the Attachment, Pages 2 and 3. Indicated speed and G force were calculated by average timing of the Falcon in the film test runs and can be assumed to be accurate within ±10%.

CONTROL ADEQUACY COMPARISON

Film test description	Percent control adequacy ±10 percent	
	Corvair	Falcon
Standard tire pressure:		
Phase I: 0 40G comparative breakaway; 5 sequences—30 m.p.h., ±10 percent	35	100
Phase II: 0.32G comparative highway handling; 5 sequences—31 m.p.h., ±10 percent	10	100
Average, phases I and II	18	100
Range ±10 percent	8–28	90–100
Minimum acceptance standard	60	60
Nonstandard tire pressure Corvair 26–26 p.s.i.:		
Phase I: 0 40G comparative breakaway; 6 sequences—30 m.p.h., ±10 percent	37	100
Phase II: 0.32G comparative highway handling; 3 sequences—31 m.p.h., ±10 percent	8	100
Average, phases I and II	22	100
Range ±10 percent	12–32	90–100
Minimum acceptance standard	60	60

Based on a 60% minimum acceptance standard, the Corvair with standard tire pressure achieved 30% of the standard (18%/60%). Applying the maximum favorable variation of +10%, the Corvair achieved 48% of the minimum acceptance standard (28%/60%).

Additional conclusions which result from the Attachment are:

1. For non-standard tire pressure of 26–26 psi, severe control problems began upon entering the second corner of the S curve in Phase II highway handling whereas similar control problems with standard tire pressure began on leaving the second corner of the S curve. This amounts to a six second reduction in "on course" control which translates to an approximate 33% deterioration for 26–26 psi tire pressure.

2. For non-standard tire pressure of 26–26 psi, in both Phase I and Phase II testing, the Corvair deviated into the oncoming lane six times during nine test runs and demonstrated complete loss of control four times during the nine test runs.

3. For standard tire pressure in both Phase I and Phase II testing, the Corvair deviated into the oncoming lane eleven times during the ten comparative tests when running with the standard tire pressure. Complete loss of control occurred five times during the ten test runs.

FILM ANALYSIS—FALCON VERSUS CORVAIR HANDLING, DEFINITION OF CONTROL DEVIATION SEVERITY

Severity rating	Percent control adequacy	Vehicle/driver control conditions
Stable	100	No deviations.
Minor	[1] 50–75	Minor swerve with full recovery using less than oncoming lane or adjacent shoulder.
Major	25	Major swerve which occupies oncoming lane and/or shoulder equal to car width.
Lost	0	Major swerve which occupies more than oncoming lane and/or shoulder greater than car width and results in loss of control including spinouts.

[1] Minor deviation which uses oncoming lane, 50 percent. Minor deviation which stays in lane or uses adjacent shoulder 75 percent.

Note: Assigned percentage values should be assumed to be representative within a range of ±10 percent. Minimum acceptance standard: Defined as 60 percent which allows minor deviations of 50 to 75 percent control adequacy but full recovery.

FILM ANALYSIS—FALCON VS. CORVAIR HANDLING

DATA SHEET

Phase I—Comparative Breakaway.—Falcon at 30 mph, Corvair at Less than 30 mph

150 foot radius circle

Dry blacktop surface slightly undulating; lane width of 12 feet

Falcon stable at .40 G

Speed and G force calculated from film using average time of Falcon in test runs; assume accuracy of ±10%.

Test run	Corvair: Sequence of control deviations: Oncoming lane	Corvair: Sequence of control deviations: Shoulder	Corvair: Severity of control deviation	Percent control ±10 percent adequacy: Corvair	Percent control ±10 percent adequacy: Falcon
Standard pressure, 15—26 p.s.i.:					
1	1st		Minor	50	100
2		1st	Lost	0	100
3	1st	2d	do	0	100
4		1st	Minor	75	100
5	2d and 4th	1st and 3d	do	50	100
Average 5 tests				35	100
Nonstandard pressure, 26—26 p.s.i.:					
1	1st		Minor	50	100
2		1st	do	75	100
3	2d	do	Major	25	100
4		do	Lost	0	100
5		do	Minor	75	100
6		do	Lost	0	100
Average 6 tests				37	100

Film Analysis—Falcon vs. Corvair Handling

DATA SHEET

Phase II—Comparative Highway Handling—Falcon at 31 mph Corvair at Less than 31 mph

S curve, 136° arc at 200 foot radius, 100 feet straightaway, 140° arc at 200 foot radius, 182 feet straightaway

Dry blacktop surface slightly undulating; lane width of 12 feet

Falcon stable at .32G

Speed and G force calculated from film using average timing of Falcon

Speed and G force calculated from film using average timing of Falcon in film sequences; assume accuracy of ±10%

Test run	Corvair: Sequence of control deviations: Oncoming lane	Corvair: Sequence of control deviations: Shoulder	Corvair: Severity of control deviation	Percent control ±10 percent adequacy: Corvair	Percent control ±10 percent adequacy: Falcon
Standard pressure, 15 to 26 p.s.i.:					
1	1st, 3d	2d, 4th	Lost	0	100
2	2d	1st	do	0	100
3	1st, 2d		Major	25	100
4	1st	2d	Lost	0	100
5	2d	1st	Major	25	100
Average 5 tests				10	100
Nonstandard pressure 26 to 26 p.s.i.:					
1	1st	2d	Lost	0	(1)
2	1st, 3d	do	do	0	100
3	1st	do	Major	25	100
Average 3 tests				8	100

[1] Not available.

Note: For 26 to 26 p.s.i., major control problems began at entering 2d corner compared to control problems at 15 to 26 p.s.i. which began on leaving 2d corner amounting to reduction of 5 to 7 seconds in "on course" control test time of 16 o 20 seconds for 15 to 26 p.s.i. test; represents approximately 33 percent deterioration.

EXHIBIT V

Preliminary Evaluation of the Corvair in Comparison to the Falcon

INTRODUCTION TO HANDLING FILM

We have prepared a film showing the handling characteristics of the Corvair as compared with the Falcon. The cars have been run in a circle and on the handling course at speeds between 40 and 45 MPH. This speed is well within the capacity of the Falcon on the curves shown. The Corvair has been shown attempting to maintain the same speed as the Falcon in the various maneuvers. It is necessary to emphasize at this point that these are completely objective tests and in no sense have they been contrived to show the Corvair in an unfavorable light. The drivers of both cars are equally skilled drivers from our test track area, and the Corvair driver was instructed to make every effort to keep his car under control.

For reference purposes, we have also shown the Volkswagen and the Renault Dauphine under similar circumstances at comparable speeds. These pictures show that both of these vehicles have ability to corner at higher speeds with less instability than the Corvair.

(Film.)

DISCUSSION OF HANDLING FILM

These pictures have shown only that the Corvair exhibited instability under extreme cornering conditions, under which the Falcon remained stable. The lack of extreme cornering ability is not a significant product disadvantage in itself. Of much greater significance in the preceding film has been the difficulty experienced by the Corvair driver in re-establishing control over his vehicle once it had been lost. This is indicative of a lack of stability which is more likely to be encountered by the average driver under average conditions and this condition is deemed to be a significant product disadvantage.

Preliminary Evaluation of the Corvair in Comparison to the Falcon

Initial comparison evaluations of the 1960 Corvair and Falcon vehicles have been made at the Dearborn Test Track during the week of September 19, 1959.

These evaluations include laboratory and static tests as well as vehicle operating tests. Specific vehicle specification and package dimensions have been taken, car statistic rigidity tests have been run, preliminary performance and economy results have been obtained, a customer-type evaluation has been conducted by qualified personnel, a film demonstrating car handling characteristics has been made along with photographs which demonstrate comparative luggage space.

Visual impressions

The Corvair is attractively styled and appealing in appearance but in contrast to the Falcon has the appearance of a much smaller car. The interior trim and finish are much inferior to the Falcon, even the deluxe Corvair being less attractive in these respects than the standard model Falcon. Specific areas of poor finish in the Corvair include exposed welding seams insufficiently covered by plastic and a generally unfinished appearance below the instrument panel.

Package and entrance

All dimensions of the Corvair are slightly smaller than the corresponding dimensions of the Falcon. The most notable difference is the overall height of the vehicle which is 2½'' less than that of the Falcon. The Corvair is unsatisfactory for tall people, having 1.3'' less head room in the front seat, a ground to wind-cord dimension 3.1'' less than the Falcon and restricted left leg room due to the front wheelhouse intrusion into the driver's compartment. Effective leg room and knee room in the rear seat are substantially less than the Falcon. The absence of the tunnel in the Corvair received favorable comment by the evaluators but the standard transmission car has a gear shift lever in the middle of the front compartment floor which effectively eliminates any accommodation for a center passenger.

Corvair luggage accommodation is inadequate. The car has an 11.9 cubic foot space in the front compartment which is cut up with very little flat floor area, and an additional 4.1 cubic foot available behind the rear seat cushion. By comparison the trunk on the Falcon is spacious (23.7 cu. ft.), uncluttered and accessible.

Ground clearances are in all cases less on the Corvair than on the Falcon. For example, the clearance under the Falson engine oil pan is 7.4'' and the Corvair gas tank which is in a comparable location has 6.4'' clearance, thereby increasing the potential for damage.

Performance and economy

The performance of the Falcon and Corvair cars is approximately the same for both the synchromesh transmission and the automatic transmission, with a small margin in favor of the Corvair automatic on passing times from 50 MPH.

The fuel economy of the Falcon is better than that of the Corvair. On the basis of synchromesh transmission, the Falcon is approximately 2 MPG better for average customer fuel economy. On the basis of automatic transmission, the Falcon is approximately 1 MPG better than the Corvair for average customer fuel economy. It was noted that the fuel economy saving for the Falcon is more pronounced in city than in surburban driving.

Ride and handling

The overall ride characteristics of the Falcon are superior to those of the Corvair. The Falcon has better ride balance, less rear set jerk, less front seat pitch and less bounce.

The steering of both vehicles is light and responsive. The overall lower steering ratio of the Corvair provides quicker maneuvering. The parking effort and turning diameter of both cars were considered satisfactory. Even though the Corvair has less weight on the front wheels, there is no apparent advantage in reduced steering efforts due probably to its lower front tire pressures and lower steering ratio.

The handling and stability of the Falcon are excellent. The Corvair with its rear heavy weight distribution shows marked instability under conditions of severe cornering and in passing. While the driver will not encounter difficulty under most normal driving conditions, there are frequently encountered emergency conditions such as slippery pavement or emergency maneuvering in which the driver cannot maintain control of the vehicle. The Corvair falls considerably short of our handling standards.

Miscellaneous operating evaluations

Favorable comments on the Corvair include the following:

Overall car noise and harshness was considered superior to the Falcon, especially in the front seat. The car has a solid feel on ordinary roads with very low shake. Vehicle parking effort and turning diameter were satisfactory. Driver visibility, gradeability characteristics, instrument panel layout, quality of instruments and electrical system components appeared good.

Unfavorable comments on the Corvair were:

There is no parking lock on the automatic transmission car. Handbrake operation was inferior and hill holding ability was comparable to the Falcon only after the ratcheting lever was pulled twice. Also, this is considered a safety hazard when the handbrake is required for emergency stops. The clutch engagement on the standard transmission car was considered to be too sudden and low speed lugging was considered inferior with insufficient throttle response at low speeds.

Structure and design

The Corvair has a heavy and soundly constructed body having rigidity approximately 55% greater in torsion and 30% greater in bending than the Falcon. Body weight analysis shows the body-in-white to be about 100 lbs. heavier than that of the Falcon, which substantially cancels the weight advantages gained by the aluminum engine power package design and smaller dimensions. The weld-on front fenders of the Corvair contribute to the structure, but penalize the customer in costs of collision repair and insurance.

The Corvair power package with rear suspension as a unit is readily removable. However, accessibility to most powertrain components for routine maintenance and repair is definitely inferior to the Falcon.

General conclusions

Notwithstanding efforts to be conservative in their relative evaluation of the Falcon and Corvair, the evaluators unanimously concluded that the Falcon is a notably superior vehicle in nearly every respect, being more appealing from the showroom standpoint, more appropriate to the utility concept of an economy car, having greater real value in its overall character, and more economical to produce and operate.

EXHIBIT NO. 1

FALCON VERSUS CORVAIR PACKAGE COMPARISON

	Differential	1960 Falcon (4-door)	1960 Corvair (4-door)
External dimensions:			
Wheelbase (inches)	+1.5	109.5	108.0
Overall length (inches)	+1.4	181.2	179.8
Overall height (inches)	+2.5	54.5	52.0
Overall width (inches)	+1.6	68.6	67.0
Front tread (inches)	+.9	55.0	54.1
Rear tread (inches)	+.4	54.5	54.1
Tire size		6.00 x 13	6.50 x 13
Turning diameter: Center of tread (feet)	−.59	37.7	38.29
Ground clearance to:			
Engine oil pan (inches)	−.1	7.4	7.5
Transmission oil pan (inches)	+.8	7.6	6.8
Gas tank (inches)	+3.6	10.0	6.4
Frame side member (inches)	+1.4	7.4	6.0
Entrance room:			
Front door:			
Entrance above "A" point (inches)	+.3	29.4	29.1
Entrance above ground (inches)	+3.1	49.3	46.2
Rear door:			
Entrance above cushion (inches)	−1.5	26.4	27.9
Entrance above ground (inches)	+2.3	48.7	46.4
Luggage compartment:			
With spare tire (volume in cubic feet)	+11.8	23.7	11.9
Behind front seat (loaded to bottom of backlight with 2d seat lowered) (extra cost option) (cubic feet)			17.6
Behind 2d seat (loaded to bottom of backlight, package tray area) (cubic feet)			4.1
Front seat room:			
Effective head room (inches)	+1.3	38.9	37.6
Effective leg room (inches)	+.1	44.6	44.5
Shoulder room (inches)	+.7	55.2	54.5
Hip room (inches)	−1.5	57.1	58.6
Deflection "A" point to floor heel point (inches)	+1.6	5.1	3.5
Steering wheel clearances:			
To cushion (inches)	−.1	5.5	5.6
To seat back (inches)	−1.5	13.0	14.5
Steering wheel diameter (inches)	+1.0	17.0	16.0
Eye level:			
To windshield upper "GO" (inches)	+2.1	6.8	4.7
To top of steering wheel (inches)	−.7	2.9	3.6
Second seat:			
Back of front seat to 2d seat back (inches)	+2.8	27.9	25.1
Effective head room (inches)	+.3	37.3	37.0
Effective leg room (inches)	+4.6	40.1	35.5
Effective knee room (inches)	+2.2	4.6	2.4
Shoulder room ("A" point) (inches)	+1.5	55.2	53.7
Hip room (inches)	−.9	57.0	57.9
Deflection "A" point to floor heel point (inches)	+.8	6.5	5.7
Glass area: Total (square inches)	+289.0	3,695.2	3,406.2

EXHIBIT NO. 2

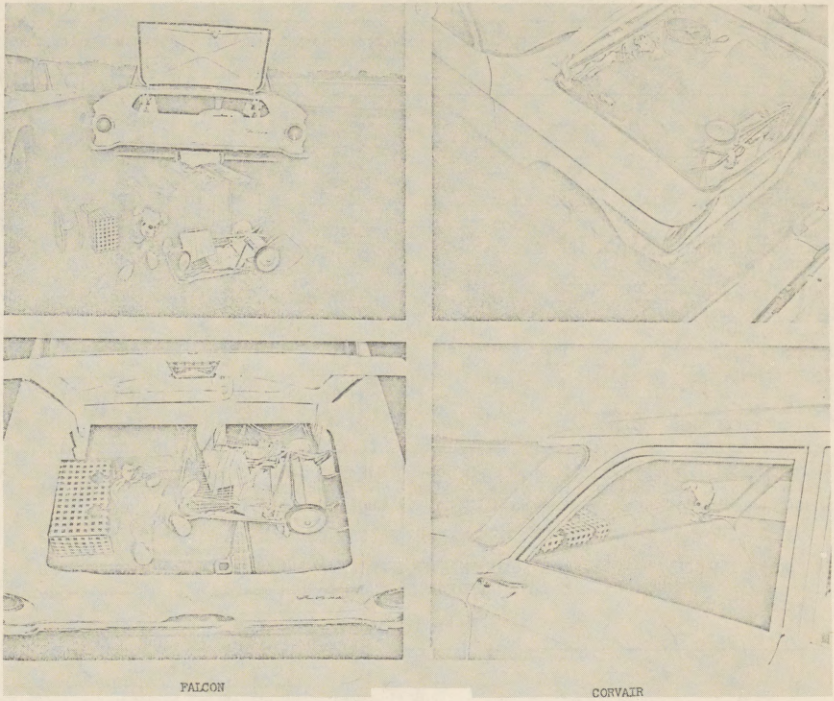


EXHIBIT NO. 3

FALCON VERSUS CORVAIR, CAR STATIC RIGIDITY TEST REPORT

	1960 Falcon engine prototype 4-door 2948XK	1960 Corvair 4-door
Torsion test:		
Applied twist torque (pound-feet)	3,890	3,226
Angular frame deflection over wheelbase	.062	.033
Torque rate (pound-feet per degree):		
Over wheelbase	6,270	9,780
Front wheel centerline to dash	48,600	53,770
Dash to rear wheel centerline	7,200	11,950
Over 100 inch length	6,870	10,560
Bending test:		
Test load (pounds)	850–2,000	850–2,000
Maximum deflection (inches): Frame: (Side rail structure):		
Over wheelbase	.013–.047	.011–.035
Over body length	.017–.046	.007–.024
Rear end	.022–.050	.002–0

Source: Ford Advanced Car Engineering, Sept. 21, 1959.

EXHIBIT NO. 4

PERFORMANCE AND ECONOMY COMPARISON, FALCON VERSUS CORVAIR, DEARBORN PROVING GROUND

	Synchromesh transmission		Automatic transmission	
	Falcon	Corvair	Falcon	Corvair
Model	2 door	4 door	4 door	4 door
Axle ratio	3.10	3.55	3.10	3.55
Tires	6.00 x 13	6.50 x 13	6.00 x 13	6.50 x 13
N/V	46.3	50.5	46.3	50.5
Tire pressure	24–24	16–26	24–24	16–26
Displacement (cubic inches)	144	140	144	140
Stall speed			1,656	1,465
Curb weight	2,400	2,383	2,487	2,423
Coast time (70 to 10 m.p.h.) seconds	96.03	105.23	76.6	96.5
Performance:				
0 to 4 seconds (feet)	79	80	58	56
0 to 10 seconds (feet)	395	391	312	319
50 m.p.h. plus 10 seconds (feet)	856	858	835	838
Passing time:				
From 40	11.8	10.60	10.65	11.0
From 50	13.0	12.10	15.20	13.0
Customer fuel economy (m.p.g.):				
City	17.4	16.0	16.7	14.8
Suburban	25.4	23.0	22.4	22.4
Customer average	21.4	19.5	19.6	18.6

Note: This data is reliable for comparison purposes. However, it is not official data because the tests were not run under Arizona conditions, additional confirmation tests are required, tuning specifications on the Corvair were incomplete and the synchromesh Falcon had only 850 break-in miles at the time of the test instead of 1,500 miles.

EXHIBIT No. 5

FALCON VERSUS CORVAIR—CORVAIR GASOLINE HEATER EFFECT ON VEHICLE FUEL ECONOMY, DEARBORN TEST DATA—AUTOMATIC TRANSMISSION

[In percent]

Test	Falcon	Corvair		
		Heater off	Heater on	Loss
City	16.7	15.5	14.4	7.1
Suburban	22.4	21.4	20.0	6.5
Average	19.6	18.5	17.2	7.0

Notes:

1. These data are reliable for comparison purposes. However, they are not official because the tests were not run under Arizona conditions and additional confirmation tests are required.
2. Both Corvair tests were run on the same day. Falcon data was run under similar weather conditions.
3. General vehicle data same as exhibit #4.

Conclusion:

The Corvair gasoline heater used at maximum output, reduces vehicle fuel economy by approximately 1.3 MPG on an average customer economy basis.

EXHIBIT No. 6

FALCON VERSUS CORVAIR PERFORMANCE AND FUEL ECONOMY COMPARISON WITH 3.56 FALCON AXLE, DEARBORN TEST DATA

	Standard transmission			Automatic transmission		
	Falcon (ref.)	Falcon	Corvair	Falcon (ref.)	Falcon	Corvair
Performance:						
Axle ratio	3.10	3.56	3.55	3.10	3.56	3.55
0 to 4 seconds	79	81	79	58	57	56
0 to 10 seconds	395	394	386	312	316	319
50 m.p.h./10 seconds	856	853	857	835	834	838
Passing time:						
From 40	11.8	10.9	10.5	10.65	11.2	11.0
From 50	13.0	12.9	12.4	15.20	13.8	13.0
Coast time	96.0	92.9	104.5	76.6	77.2	96.5
Fuel economy:						
City	17.4	18.1	16.8	16.7	16.2	15.7
Suburban	25.4	23.6	24.7	22.4	20.6	21.6
Average	21.4	20.8	20.8	19.6	18.4	18.7

Notes:

1. These data are reliable for comparison purposes. However, they are not official because the tests were not run under Arizona conditions and additional confirmation tests are required.

2. Each of the above comparisons were run the same day, except for Corvair automatic performance which was run under similar weather condtiions. Standard transmission Falcon data is shown from exhibit #4 for reference purposes.

3. General vehicle data same as exhibit #4.

Conclusion: On the basis of equivalent axle ratios (3.56:1) the performance of the Falcon and Corvair are approximately the same for both synchromesh and automatic transmissions. Average customer fuel economy is approximately the same for both cars, with the Falcon being better under city conditions. (1.3 MPG synchromesh, .5 MPG automatic)

EXHIBIT No. 7

FALCON VERSUS CORVAIR, DRIVETRAIN SPECIFICATION COMPARISON

Item	Falcon	Corvair
Engine:		
Type	OHV, I-6	Horizontal opposed 6.
Displacement	144.3 cubic inches	140 cubic inches.
Bore and stroke	3.375x2.60	3.50x2.50.
Comparable ratio	8.7:1	8.0:1.
Fuel	Regular	Regular.
Advance horsepower	90 at 4,200	80 at 4400.
Advance torque	138 at 2,000	Not available.
Carburator	Single, 1V	Dual, 1V.
Choke	Manual	Automatic.
Air cleaner	Dry paper	Oil wetted foamed polyurethane.
Firing order	153624	145236.
Tappets	Mechanical	Hydraulic.
Engine mounts	2 fr., 1 rr	2 fr., 1 rr.
Fuel capacity (gallons)	14	11.
Idle speed (Automatic in drive)	520	500.
Cooling:		
Cooling medium	Water	Air.
Fan	4 blade, 14 inch diameter	24 blade, 11 inch diameter.
Shrouding	Not shrouded	Shrouded.
Exhaust	Single	Single.
Transmission:		
Synchromesh ratios:		
1st	3.29	3.22.
2d	1.75	1.84.
3d	1.00	1.00.
Reverse	4.46	3.65.
Clutch diameter	8.5x5.4	9.12x6.12.
Automatic ratios:		
1st	1.75	1.82.
2d	1.00	1.00.
Reverse	1.50	1.82.
Converter	2.4	2.6.

EXHIBIT NO. 7—Continued

FALCON VERSUS CORVAIR, DRIVETRAIN SPECIFICATION COMPARISON

Item	Falcon	Corvair
Axle and driveline:		
Axle type	Semi-floating hypoid	Integral with transmission.
Axle ratio (standard and automatic)	3.10	3.55.
Tire size	6.00x13	6.50x13.
Tire pressure	24 p.s.i. front, 24 p.s.i. rear	16 p.s.i. front, 26 p.s.i. rear.
N/V	46.3	50.5.
Driveshaft	1 2.50x55.5 with 2 U-joints	None.
Halfshafts	2 with no U-joints	2 with 1 U-joint each.

EXHIBIT VI

FORD MOTOR CO.,
FORD DIVISION,
June 17, 1960.

To: Messrs. W. C. Ford, D. N. Frey, C. L. Goyert, J. L. Hooven, J. E. Judge, A. A. Kucher, H. A. Matthias, R. S. McNamara, Will Scott, J. O. Wright.
From: F. J. Hooven.
Subject: Handling of Chevrolet Corvair.

A question arose in the Advanced Product Planning meeting of May 31, 1960 as to whether the poor handling and stability characteristics of the Chevrolet Corvair had adversely affected its sales. It was agreed by all present that there had been little or no adverse affect on sales and that the unfavorable characteristics of the Corvair did not emerge in normal customer-type driving.

The time was not appropriate for a more thorough discussion of the implications of poor vehicle stability but I believe there should be some mention of the relationship between this characteristic and safety. One of the outstanding characteristics to emerge from our comparative tests of the Corvair and Falcon was the fact that not only did the Corvair have a low limit of maximum permissible speed in a turn but once this limit had been exceeded, the vehicle became totally uncontrollable. The penalty for a misjudgment of speed in a turn, or of insufficient attention on the part of the driver, is therefore not only more often encountered in a Corvair but is much more severe.

Very shortly after this conversation took place I happened on the scene of an accident involving a Corvair which aptly illustrates this hazard. Inspection of the vehicles and the marks on the pavement made it clear that the cause of the accident was the loss of control of the Corvair in a turn causing it to spin out across the oncoming lane, strike another car, and come to rest against a lightpole. I obtained a copy of the police accident report, which verified the above conclusions.

Other reports, which I am in a less fortunate position to verify, also support the conclusion that such vehicle instability is in truth a serious accident risk and safety factor. While such factors have less direct affect on vehicle sales than more easily discernible product characteristics they certainly constitute a highly undesirable condition which we at Ford should make every effort to avoid.

F. J. HOOVEN.

EXHIBIT VII

JUNE 29, 1972.

Mr. ROBERT J. WAGER,
Committee on Government Operations, U.S. Senate, Washington, D.C.

DEAR MR. WAGER: I have completed revisions to my statement of January 21, 1972. In addition, I will attempt to answer the four questions which you asked in your letter of March 24, 1972. First, however, I should state an overcovering problem which would confront anyone who wanted to exactly duplicate a 1960 model car.

This problem relates to our discussion in January concerning the DOT tests on the Corvair and competitors. As you know, design improvements are made on service parts available for older model cars and these improved parts are interchangeable with the original design. An accurate comparison requires exact 1960 specifications in all of the suspension/tire system parts and assemblies which affect stability and controllability. The 1960 Corvair can be made more favorable in handling and controllability by minor changes indiscernible to the layman. For example, it is important that tires meet the exact specifications of the 1960

Corvair tires if the comparative tests are to be valid. It is equally important that roll rates and roll rate distribution be in the range of those measured on the 1960 vehicles and reported in the Ford reports sent to you. Also, the type of shock absorbers including cut-off characteristics should be clearly defined as those in production on the 1960 vehicle.

Following are my answers to your questions:

Question 1. Are the results of the Ford tests consistent with your analysis?

Yes. All of those who were involved in evaluating the 1960 Corvair concluded that it failed to meet the handling and controllability standards which we establish for our products. It was the general consensus of managing engineers that had we (Ford engineers) produced such a motor car, we all would have been fired.

Your term "Ford tests" is interpreted as those types of tests in which engineers responsible for vehicle development evaluate the vehicle under numerous handling maneuvers. For example, the late Mr. Earl S. MacPherson who had been Vice President of Engineering and was retained by the Company as a consultant during the development of the Falcon expressed the opinion after evaluating the 1960 Corvair on our handling roads, "GM should fire _____ for producing a car like this." Furthermore, as stated in my earlier testimony to you and Mr. Koskinen, the very fact that movies were made for presentation to the Executive Committee indicates the significance of our evaluations in assessing the handling and controllability of the 1960 Corvair. The movies speak for themselves.

Question 2. If they are, how close is the correlation between them?

I believe the correlation is within plus or minus 10% but considering the fact that the Corvair had to follow the Falcon, a minimum acceptance standard of 60% was established for the Corvair. Therefore, compared to the Falcon which was the lead car in the comparative tests, a very generous allowance of 50% was used in my analysis; viz:

- 100% minus 60% (minimum acceptance std.)_____ 40%
- Plus tolerance in assessing numerical analysis of controllability__ 10%

Total_____ 50%

Therefore, as indicated above and as stated in my analysis of the film, the Corvair at standard tire pressure achieved 28/60 of the acceptance standard when the maximum plus tolerance of 10% is applied to the 18% average of the Phase I and Phase II tests. Another way of stating the conclusion is to say that the 1960 Corvair at standard tire pressure achieved slightly less than one-half of the handling standard.

As I defined it, a minor swerve with *full recovery* using less than the on-coming lane rated 50% control adequacy. It is significant that had all the swerves been into the oncoming lane with *full recovery*, the Corvair would have met the minimum handling standard of 60% when applying the plus 10% tolerance. As a matter of comparison, it should be noted that a swerve with *full recovery* onto the shoulder rather than the oncoming lane (equal to less than car width) was only penalized 25% from the 100% base and therefore assigned a 75% value for control adequacy. If, for example, all the swerves had been onto the shoulder with *full recovery* the Corvair would have exceeded the handling standard of 60% by 25% $(((75/60)-1)\times 100)$ without application of the plus 10% tolerance.

It is common knowledge that car/driver systems frequently experience minor swerves. The ability of the car/driver system to recover under these minor adverse conditions is essential for a safe handling motor car.

In Mr. Fred J. Hooven's letter of June 17, 1960, he summarizes for Ford Corporate management our conclusions at that time concerning recovery and rear wheel adhesion of the 1960 Corvair:

> "One of the outstanding characteristics to emerge from our comparative tests of the Corvair and Falcon was the fact that not only did the Corvair have a low limit of maximum permissible speed in a turn but once this limit had been exceeded, the vehicle became totally uncontrollable. The penalty for a mis-judgment of speed in a turn or of insufficient attention on the part of the driver, is therefore not only more often encountered in a Corvair but is much more severe."

Also,

> "Other reports which I am in a less fortunate position to verify also support the conclusion that such vehicle instability is in truth a serious acci-

dent risk and safety factor. While such factors have less direct affect on vehicle sales than more easily discernible produce characteristics they certainly constitute a highly undesirable condition which we at Ford should make every effort to avoid."

And from the Executive Committee presentation of October 1, 1959, we said: "The Corvair falls considerably short of our handling standards."

Question 3. "If they are not, how great are the differences between them?"

Not applicable.

Question 4. "From the Ford tests, what conclusions can be drawn about the stability and handling of the various cars?"

I assume that "the various cars" include the 1960 Falcon, 1960 Corvair, and the 1959/1960 Renault Dauphine and Volkswagen.

- The Falcon was clearly superior.
- The Renault Dauphine and Volkswagen were superior to the Corvair.
- The Corvair was not competitive with other production cars of that era.

Apart from the questions in your letter, I am taking the liberty of providing some additional information concerning Bill Stroppe's participation in the Falcon/Corvair evaluations which, as you recall, we thoroughly discussed at the outset of the January 21 meeting. You will find enclosed with this letter an article from the Detroit News dated June 8, 1971, written by Mr. Robert W. Irvin who is the Detroit News Automotive Writer, He relates the substance of a phone conversation he had with Bill Stroppe three days following my letter to Senator Magnuson. In this article Mr. Irvin quotes Bill Stroppe as saying "Falcon was a fabulous little car as far as handling; safer under all conditions. The Corvair was a good handling little car, but you had to know how to drive it and if you got in trouble you had to be quick to correct it."

Sincerely,

HARLEY F. COPP.

JULY 27, 1972.

Mr. DOUGLAS TOMS,
Administrator, National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C.

DEAR MR. TOMS: I have enclosed additional questions from yesterday's oversight hearing to be included in the Record. Although I realize that there are a great number of questions enclosed, I believe that these are necessary for the Committee to do an adequate job in reviewing the Administrations' implementation of the National Traffic and Motor Vehicle Safety Act.

As I stated during the hearings, over the course of the next several weeks, I may be sending additional questions to you for the Record. If you have any inquiries regarding these questions, please contact the staff of the Commerce Committee.

I appreciate your two appearances before the Committee.

Sincerely yours,

VANCE HARTKE.

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., September 13, 1972.

Hon. VANCE HARTKE,
Chairman, Surface Transportation Subcommittee, Committee on Commerce, U.S. Senate, Washington, D.C.

DEAR SENATOR HARTKE: This is in response to your letter of July 26, 1972, requesting answers to sixty (60) questions related to the Senate Commerce Committee hearing on July 25. The requested information is enclosed with this letter.

Please let me know if I can be of any further assistance.

Sincerely,

DOUGLAS W. TOMS, *Administrator.*

Enclosures.

Passive Restraints

Air Bag Restraints

Question. How much money has NHTSA on airbag development?
Answer. Approximately $1.6 million.
Question. Does this figure indicate direct or supporting research?
Answer. Direct research.
Question. Does this figure include, for example, airbag research included in the ESV project?
Answer. No.
Question. What is the magnitude of research contracted for by NHTSA relating to research for other passive systems?
Answer. Very small compared to air bag research because only the development of the most promising systems is funded. Funds do not permit expenditures on other, less promising but alternative systems to any great extent.

Other Passive Systems for 1976 Models

Question. Do any other passive systems show any promise for use by model year 1976 to comply with Standard 208?
Answer. In addition to air cushion restraint systems, passive safety belt systems show promise for use by Model Year 1976 to comply with Standard No. 208.
Question. At the ESV conference recently held at the Hilton, the Japanese demonstrated a production ready passive belt system. Have you evaluated the system?
Answer. The Takata-Kojyo passive belt system was tested at the Naval Air Development Center crash facility in February 1972. Barrier crash equivalent speeds were up to 40 mph and the subject was a 50th percentile anthropometric dummy. There were no system failures. The system is considered qualified for further testing using human subjects and it is expected that such performance evaluation studies will be conducted at the end of 1972 or early in 1973.

Benefits of Air Cushions and Lap/Shoulder Belts

Question. In conducting its cost benefit analysis of the passive restraint, RECAT reports stated that "The airbag cost is substantially higher, and the predicted benefit is no greater than the corresponding cost and benefit of the well known, time-tested 3 point belt harness system, assuming high utilization." Are the benefits of the two systems comparable in your opinion?
Answer. If 100 percent usage were projected for both air cushion passive restraint system and 3-point lap and shoulder belts, the benefits of either system would be comparable at lower crash speeds represented by the 1976 requirements of FMVSS 208. In frontal crashes at higher speeds, where over 60 percent of frontal crash fatalities occur, belt systems are probably much less effective than air cushions. Further, while air cushion passive restraint systems are capable of achieving essentially 100 percent usage, it is doubtful that 3-point belt systems can ever protect a high percentage of vehicle occupants. Problems of belt fit, nonuse, improper use, wear and degradation, mechanical failure, and others would be very difficult to overcome.

Cost Differential: Air Cushions Versus Lap/Shoulder Belts

Question. What is the cost differential between the two systems?
Answer. The NHTSA is constantly attempting to improve its cost data on the latest types of air cushion passive occupant crash protection systems. In round numbers, we estimate that a good belt system would cost about $100 per car. This would include inertia reel shoulder belts for the two front outboard seats, lap belts with retractors for the other seats, and an ignition interlock system to achieve high belt usage. An air cushion based passive occupant crash protection system would probably cost about $200–250 for all car occupants. It should be pointed out that such a passive system would offer a very high level of protection for all six occupants of a standard size sedan, while the above belt system would offer lap and shoulder belts for only two occupants, with lap belts alone for the other four occupants. It is doubtful that a lap-belted occupant could sustain a 30 mph or greater barrier collision without death or very serious injury. Similarly, a lap and shoulder belt system presently reaches its maximum capability, based on

available research data, somewhere in the 30–40 mph barrier collision speed range. Conversely, the air cushion passive occupant crash protection system has the potential for protecting all car occupants up to barrier collision speeds in the 45–60 mph range.

A recent NHTSA study has estimated that air cushion and vehicle structural improvements necessary to achieve future 50 mph passive protection may cost about $350 per car. This high level of protection was estimated to be capable of saving 13,300 lives and preventing 586,000 serious and disabling injuries annually. The conclusion of this study was that such 50 mph passive protection would result in an annual cost of approximately $5 billion, with an annual benefit, in terms of lives saved and injuries prevented, of $7 billion. Of course, assumed dollar values alone cannot measure the full benefit to our society of achieving such major reductions in the presently unacceptable crash death and injury toll.

RECAT Air Cushion Cost Estimates

Question. RECAT estimates that the cost of the airbag vehicle will be $300. Why are your figures and their figures so much different?

Answer. The RECAT cost estimates for air cushions were not independently derived from analyses of actual hardware required for such systems. Rather, they were derived from air cushion cost estimates supplied by the vehicle manufacturers. Such estimates have proven to be inflated, based on past NHTSA experience. In some cases, they represent a rapid amortization of research, styling, and tooling costs associated with air cushion development and vehicle installation, rather than a variable cost associated with the additional hardware required for air cushions in future vehicles designed to accept such systems.

Markups on Safety Equipment

Question. What traditionally is the manufacturer mark-up on safety equipment?

Answer. Federally required safety equipment installed on new vehicles is typically lumped into the basic vehicle cost and markup is traditionally determined by market conditions which determine the price of a total car. As a general rule, safety equipment, as well as other items of vehicle equipment, usually reaches the consumer at about twice the actual factory production cost. This markup is not all profit; as overhead, etc., must also be considered. Profit is best determined by an analysis of the corporate percent earned on sales and the overall percent earned on invested capital for the particular company.

Markups on Air Cushions

Question. What will be the mark-up or airbags?

Answer It can be assumed that air cushions will reach the consumer at about twice the actual factory production cost, consistent with industry practice.

Question. Are federal regulations needed to limit the mark-ups on mandatory safety equipment?

Answer. We do not believe that Department of Transportation regulations should be authorized for the purpose of limiting the mark-ups on mandatory safety equipment. Insofar as the Department is concerned, competition among manufacturers should dictate prices. It is not the role of the Department of Transportation to regulate profits on any equipment incorporated into motor vehicles.

Relationship Between ESV and Rulemaking Plans

Question. An issue which was raised at last month's hearings involved the so called "collision course" between the ESV program and the standards activities. What steps will NHTSA be taking over the course of the next few months to achieve a consistent approach?

Answer. During the Third International ESV Congress in Washington, D.C., several questions were raised regarding the relationship between ESV specifications and NHTSA rulemaking plans.

A number of actions are scheduled to clarify this issue:

1. The National Highway Traffic Safety Administration is sending a team of top technical staff to Japan and Europe in August and September. The principal objectives of the visit will be:

   a. Solicit views of foreign governments and firms on NHTSA auto safety programs particularly, U.S. research efforts related to establishing regulations for production vehicles, and

b. Obtain more specific data resulting from extensive tests being conducted to improve occupant crash protection, vehicle handling and stability and other safety aspects.

2. At Secretary Volpe's direction, a work shop will be held following this series of consultations to discuss the relationship between ESV specifications and NHTSA ruelmaking plans with the ESV countries. If necessary, further consultations will be scheduled to discuss specific points to be sure that NHTSA is fully aware of the problems and capabilities of the international automobile industry as regards planned rulemaking actions and ESV specifications. At that time, ESV specifications will be generated that coordinate fully with planned rulemaking actions.

EVS-STANDARDS

The NHTSA has already made some adjustments to the ESV Program which will assure correlation of the ESV work with the FMVSS's, and other actions are in progress to follow through on the implementation of this modified approach. First, the schedule for fabrication of additional ESV test cars has been stretched out six months. This will provide necessary time for the current ongoing safety research, especially foreign governmental and industrial work, to be completed. Second, the performance requirements for these additional cars are being carefully reviewed against both the Standards and the research findings. To do this, a group of NHTSA in-house technical teams have been organized to thoroughly review the status of automotive safety research and standards development. These teams will be consulting with saftey research centers and manufacturers to solicit their views and to obtain the most recent data.

Finally, a performance specification for an ESV considered representative of a late 1970's safe car will be prepared. Only after full government, research and industry review of this specification will the development, fabrication, and test phase be initiated. These actions will result in a fully coordinated ESV and standards program.

In order to continue the advanced total-systems research essential to longer range highway safety development, an advanced research ESV Program is being initiated. This effort will be directed towards the Post-1970's time period and will encompass the advanced concepts and systems now being projected for that time. Performance requirements will be consistent with basic safety levels but generally higher goals will be established for advanced systems.

Small Car Intergrity

Question. NHTSA has conducted a number of studies on the integrity of the small car in collisions with larger vehicles. What work is being conducted within NHTSA regarding the safety of small cars?

Answer. Small cars are categorized in three groups: micro-mini cars, subcompacts and compacts. Micro-mini cars weigh up to approximately 1,200 pounds; subcompacts weigh up to approximately 2,400 lbs.; and, compacts weigh from 2,400 lbs. to 3,200 lbs.

We have issued rule making proposing that vehicles less than 1000 pounds GVWR no longer be exempt from the requirements of safety standards. Further, we are conducting an in-house study into the crashworthiness of micro-mini-cars. Vehicle dimensions and crash characteristics have been solicited from twenty-one manufacturers throughout the world. This data will be used as input into two-car crash computer simulation to study vehicle-to-barrier and vehicle-to-vehicle (mixed vehicle weight) crashes. Results of the simulation will be the basis for crash test contracts which, in turn, will be the basis for crashworthiness standards.

Subcompacts and compacts are being studied similarly to the micro-mini cars except that the total effort is contracted. We already have a contract (DOT–HS–257–2–461) with AMF, Incorporated, to develop new frontal and side impact energy absorbing concepts which can be integrated into compact automobiles to provide the best overall crash characteristics. We are planning shortly to institute a similar program on subcompact cars.

Ford Lower Control Arm

Question. Has NHTSA closed its defect investigation file on the Ford lower control arm?

What is the status of the investigation?

When will NHTSA announce the outcome of the defects investigation?

Answer. The NHTSA investigation of an alleged safety defect involving lower control arms in 1965–1969 Ford passenger vehicles is continuing at present. We have just concluded full-scale vehicle testing and contractor consultants are presently evaluating the data from these tests as well as other data received or developed during our investigation. The investigation is being afforded maximum priority attention by responsible personnel and announcement of our findings and conclusions will be issued promptly upon completion.

S. 3306—Tail Light Bill

Question. Briefly outline what work NHTSA has done in the area of tail lights. In light of this work, do you believe the mandate in S. 3306 is necessary?

Answer. Since 1967, the NHTSA has sponsored 8 major research contracts on improved rear lighting systems for motor vehicles. The objective of these contracts was the development of well-founded requirements for a system which would result in a significant reduction in rear-end collisions. In each case, the contractor was carefully selected to obtain the expertise of leading scientists and engineers in the field of rear lighting and signalling. As a result of these contracts, several improvements were identified as being completely justifiable and appropriate for consideration during the development of future amendments to FMVSS No. 108 (Lighting). Other possible improvements were identified as being controversial in nature and requiring additional research and study, particularly from the standpoint of cost vs benefits. Included in this latter category are requirements for color coding of lamps, deceleration warning lamps, and panic stop signals. Further evaluations of these aspects of an improved system are currently in progress and additional research is planned for fiscal year 1973.

In the area of rulemaking actions, FMVSS No. 108 has undergone two major revisions since issuance of the initial standard in 1967. Each revision has resulted in significant improvements in the rear lighting and signalling system. A third major revision (proposed, Docket 69–19) is currently being developed and will include new or revised requirements based on results of prior research, comments in response to previous proposals, and results of independent evaluations. Outstanding among these new and revised requirements are requirements for separation of stop lamps from other rear lamps, side turn signals, improved detectability of rear signals, and more specific location and spacing of rear lighting devices. A Notice of Proposed Rulemaking on this third revision of FMVSS No. 108 is scheduled for issuance in October 1972.

In view of NHTSA's past, present, and proposed future work on improved rear lighting and signalling system, the mandate (for a specific color-coded system) in S. 3306 is not considered to be necessary. Also, the Department of Transportation already has ample authority under the Act to require use of the mandated system. The Act further provides the flexibility needed to respond to constantly changing technology in the area of rear lighting and signalling.

Vehicles in Use

COST BENEFIT OF VEHICLES-IN-USE STANDARDS

Question. Mr. Toms has publicly stated that he does not believe that motor vehicle-in-use standards are cost beneficial. On what basis is this assertion made.

Answer. Mr. Toms' statements referred to the subject of used vehicle safety in its broadest context; this includes the determination of an effective program based on present knowledge and available research, which can be implemented by the States in as practical and economical a manner as possible. Our current vehicle-in-use program is based on the establishment of performance criteria and inspection methods which must prove cost beneficial prior to being adopted by the States. Studies show that up to now there has been no significant difference in fatality rates among those States with periodic motor vehicle inspections and those without them.

Cost-Benefit Studies on Vehicles-in-Use Standards

Question. What cost-benefit studies has NHTSA conducted? Please provide them for the record. Did these cost-benefit studies include benefits to consumers other than safety benefits (such as economic benefits)?

For answers to question 18, please refer to submissions for the record of the July 25, 1972 Senate Commerce Committee hearing.

Small Car Exemption

Question. With regard to the small car exemption proposal, should the 10,000 vehicle limitation apply to the total number of vehicles produced or the total number imported into the United States?

Answer. With respect to exemptions for economic hardship or the development or field usage of vehicles utilizing new safety features or low-emission propulsion systems, we believe that the 10,000 vehicle limitation on manufacturer eligibility should be related to total vehicle production rather than total vehicles imported into this country. However, with respect to an exemption for a make of vehicle whose level of safety is equivalent to or exceeds the level of safety of non-exempted vehicles, we believe limitation should be related to the number of vehicles of the make for which an exemption is sought that are manufactured for sale in this country. In this case, the number should be 2,500, rather than 10,000.

Weicker Exemption Proposal

Question. What comments does NHTSA have on the Weicker proposal?

Answer. We believe that there should be for bases for exemption: (1) substantial economic hardship; (2) development or field usage of new motor vehicle safety features which provide a level of safety which is equivalent to or exceeds the level of safety established in the standard from which an exemption is sought; (3) development or field usage of vehicles utilizing low-emission propulsion system; and (4) a make of vehicle whose level of safety is equivalent to or exceeds the level of safety of non-exempted vehicles.

Manufacturers whose total vehicle production did not exceed 10,000 in the most recent model year would be eligible for exemptions (1)–(3). Manufacturers would be eligible to apply for an exemption under (4) with respect to a make of vehicle of which, in its most recent model year, not more than 2,500 were produced for sale in this country.

Detailed showings would be required of the manufacturers before they could receive an exemption of any type.

To ensure full public participation in the exemption process, notice of applications and decisions to grant exemptions would be published in the Federal Register.

[See p. — for text of Nader letter and NHTSA responses]

Nader Report Card—Disclosure and Adequacy of Air Cushion Research

Question. With respect to Standard 208 and airbags, Mr. Nader contends that the original 1970 rule, which has been postponed two years, "Has been the victim of inadequately disclosed research and technical support which made it a ready target for the industry's biased engineering attacks." He further points out that the fleet test which you proposed was grossly inadequate. Are Nader's allegations of inadequate research by NHTSA a fair assessment?

Answer. Research on air cushions has been disclosed to the public as rapidly and as completely as was (and is) possible. NHTSA has even implemented a policy of making monthly and preliminary progress reports from the contractors publicly available, through the docket file, as soon as they are received. This poilcy is unique among most government agencies as final project reports are typically all that is made available, upon completion of the contract. This policy has assured that all the results of NHTSA air bag research has been made available to the public as rapidly as it has been received by this agency.

On the adequacy of the research, NHTSA has devoted as much of its available research monies as possible to the development of air cushion restrain systems. Since air cushions have the highest potential of any known active or passive restraint system, NHTSA has devoted a very substantial amount to their development. Of course, with more money, more could have been done. However, the NHTSA believes that air cushion development has been and is proceeding at very close to the fastest rate that the automobile industry can absorb.

NHTSA does not feel that Mr. Nader's allegations represent a fair assessment.

Fleet Tests of Air Cushions

Question. Why was such a small fleet test originally proposed?

Answer. The size of the NHTSA fleet test of air cushion systems has been, and will continue to be contingent on the availability of well developed, safe, reliable hardware incorporated into realistic production-type vehicles. Such vehicles must

be produced by the industry before they can be tested. NHTSA is using every available means to encourage the production of large numbers of these vehicles for open fleet use, and hopes to overcome industry resistance to wide-spread non-government fleet use such that more than 5,000 air cushion cars can be in field test use by summer 1973.

AIR BAG FLEET TESTS

NHTSA's philosophy for installation of air bags in fleet vehicles changed shortly after the "DOT Air Bag Field Test Program" presentation at the First International Conference on Passive Restraints. Originally, it was planned to begin pilot tests of retrofit installations as early as January 1971. Up to 1,500 vehicles were to be equipped on post-manufactured basis to obtain air bag data from early fleet experience. This pilot fleet was to be followed by a fleet of approximately 12,500 late-1972 model cars with factory-installed inflatable restraints.

However, after the first presentation of this program it was determined that, whatever its size and coverage, fleet testing of inflatable restraints should await the availability of production models. Although this would result in a delay in fleet testing, it would allow testing of vehicles which incorporate systems more nearly resembling those to be sold to the public on the effective date of the rule. Data obtained for use in refining the rule would then be based on industry production versions rather than on retrofitted models.

As a result of this decision, the date of initiation and the magnitude of air bag fleet testing depends on cooperation of the automobile manufacturers. The Ford Motor Company was the only manufacturer to offer 1972 model year air bag equipped vehicles to the public and the Government for fleet testing. Ford plans called for the installation of air bags in a maximum of 1,000 1972 Mercury Montereys, 125 of which were purchased by NHTSA.

Automatic Collision Avoidance System

Question. What is the status of the Nader request for an advance notice of proposed rule making on automatic collision avoidance systems? The request is 6 months old . . . why was it never acted upon?

Answer. An advance notice of proposed rulemaking entitled, Automatic Braking Systems, (Docket No. 72–1; Notice 1) was issued on July 21, 1972. It was published in the Federal Register on July 27, 1972.

FMVSS Exemption on Multipurpose Passenger Vehicles

Question. Why is there an exemption from the motor vehicle safety standards for multipurpose passenger vehicles, light trucks and 10,000 pound vehicles?

Answer. There are thirty-seven standards applicable to passenger cars. Of these, twenty-two are also applicable to MPV's and fifteen are applicable to trucks. Our rulemaking plans are to extend twelve more of the thirty-seven standards to MPV's and fourteen more to trucks.

We have concentrated in the areas of greatest potential payoff. In general, vehicles are not required to comply with a given safety standard when anticipated societal benefits do not justify related costs.

NHTSA Consumer Information Programs

Question. Mr. Nader states that NHTSA has been lethargic in developing consumer information programs in NHTSA.

1. During the past three years, in an effort to aid the consumer, we have published information booklets and pamphlets dealing with the safety performance of all domestic and foreign passenger cars and motorcycles. These are "Performance Data—New Passenger Cars and Motorcycles," "Tires—A Comparison of Tire Reserve Load for Passenger Cars," and "Brakes—A Comparison of Braking Performance for Passenger Cars and Motorcycles." The publications are compiled from information provided, by law, by all automobile and motorcycle manufacturers. We are currently wrking on the publication of these Consumer Information booklets for the 1973 model year vehicles.

2. Another source of information available to the consumer is the Quarterly Report of Motor Vehicle Safety Defect Recall Campaigns. This includes make, model, model year, brief description of the defect and corrective action, number of vehicles recalled, and date of manufacturers notification of the defect.

3. As a result of comments received in response to the initial Notice of Proposed Rulemaking (NPRM) on Consumer Information—Uniform Tire Quality Grading System, the NHTSA has decided to issue a modified NPRM on this rulemaking action with opportunity to comment thereon. We are now in the final stages of issuing this revised NPRM. Issuance of the final rule is expected during the first quarter of calendar year 1973.

4. Another helpful and popular publication is a booklet designed to assist consumers in choosing and buying safe child seating systems for automobiles. The book entitled "What to Buy in Child Restraint Systems" is designed to aid the consumer in making a more informed choice when purchasing a child restraint.

5. A more recently established consumer information program is the Consumer-Response System which brings every consumer complaint immediately to the attention of a high-level executive in the manufacturer's central office, and elicits from that officer a report—on a case-by-case basis—of the remedies completed or begun for the consumer's benefit. The achievement of the system indicates a 60%–80% record of consumer satisfaction achieved. The system is expanding rapidly, following its inception in late 1971.

Question. What programs have been undertaken during your term as Administrator?

Experimental safety vehicles (ESV's)

The purpose of the ESV program is to stimulate and test new automotive safety ideas by sponsoring the development of vehicles with safety the principal design consideration. This approach of engineering a total system is in contrast to the normal piecemeal evolutionary approach of small improvements made from one model year to the next. A tremendous advance in automotive safety is anticipated which will be used to develop improved Federal Motor Vehicle Safety Standards (FMVSS) and possibly international safety standards under the international ESV program. The ESV program has progressed through the design, development and fabrication of prototype vehicles to testing for three of the four ESV contractors. The key design criteria are crashworthiness, accident avoidance pedestrian safety and post-crash factors (occupant protection). The application of total systems engineering is required to achieve the optimum trade-offs between the criteria.

International transportation traffic safety programs

International cooperation in traffic safety has made good progress during the past two years with emphasis on the Road Safety Pilot Study which the U.S. is leading under the auspices of NATO's Committee on the Challenges of Modern Society.

The development of experimental safety vehicles as part of this program is particularly important. In 1971 and 1972, agreements were concluded with France, Sweden, Germany, Japan, Italy, and the U.K. for exchange of technology. All are producing ESVs in the 2,000 and 3,000 pound weight classes to complement the 4,000 pound class U.S. ESVs.

Two international conferences were held in Fiscal Year 1972: one at Stuttgart, Germany in October 1971, and one at Washington in June 1972, in connection with Transpo. The latter was especially noteworthy in that most ESV developers in the U.S. and abroad displayed their prototypes in a separate exhibit at Dulles International Airport.

Practically every major automobile manufacturer in the world is participating in this program and the total investment exclusive of U.S. Government funds is estimated at well over $50 million. Progress to date indicated that it is entirely feasible to develop automobiles in all size categories with far higher levels of safety performance than now exists in production models. The challenge of the next several years is to complete the design, construction, and testing of the ESVs, and to implement procedures for incorporating the results in Federal Motor Vehicle Safety Standards.

Under the overall CCMS Road Safety Pilot Study which the U.S. is directing, and in addition to the ESV project in which leadership is still with the U.S., other CCMS Road Safety projects are being led by the Netherlands (Accident Investigation), France (Road Hazards), Canada (Alcohol and Highway Safety), Federal Republic of Germany (Motor Vehicle Inspection), Italy (Emergency Medical Services), and Belgium (Pedestrian Safety).

The Accident Investigation project is aimed at determining the feasibility of using uniform procedures and reporting on accident investigations. About

85-820 O - 73 - 26

25 teams are now at work in North America and Europe making scientific studies of about 1,000 crashes. If the study establishes the value of uniform international procedures for investigating crashes, and such procedures are adopted by NATO allies and other countries, far more information will become available on such important matters as the effectiveness of vehicle safety features and the identification of structural design factors responsible for injury and deaths.

Special Program: YOUTHS Highway Safety Advisory Committee

The new 15-member YOUTHS Highway Safety Advisory Committee planned and directed a national youth highway safety conference, SURVIVAL '71, with more than 120 delegates representing every State in the Union. The theme and title of SURVIVAL '71 was underscored by the National Transportation Safety Board statement that, "Driving and riding with other young people constitute the greatest single hazard to survival which American youth must pass successfully to reach adulthood." Highway deaths cause *half* of all deaths among young people between 15 and 24, or an annual average of 50 killed each day.

The SURVIVAL '71 delegates and members of the YOUTHS Committee developed plans for youth action and organization at the State, local and Federal level. They have organized State youth conferences on highway safety; been selected by their governors to sit on highway safety advisory boards; and, initiated a variety of action projects.

Federal Motor Vehicle Safety Standards (FMVSS) and Regulations

Improvement in the safety qualities of motor vehicles and motor vehicle equipment is accomplished in part by the issuance of Federal Motor Vehicle Safety Standards (FMVSS) expressed in terms of performance requirements which the manufacturers must incorporate in new vehicles.

A total of fifty FMVSS and regulations have been issued. As new data become available, existing standards frequently require updating and strengthening. Forty-one amendments to the standards were issued during Fiscal Year 1972 alone. A new regulation was adopted which brought the number to eight.

Uniform tire quality grading system

In accordance with the National Traffic and Motor Vehicle Safety Act of 1966, PL 89–563, a "Uniform Tire Quality Grading System" (UTQGS) was issued in September 1971 to assist the consumer to make an informed choice in the purchase of motor vehicle tires. This proposed Consumer Information Regulation provides a first-generation UTQGS based on *tire strength*, *high speed* and *endurance* performance, plus uniformity and *balance*. These criteria would be evaluated and rated as to performance, and the manufacturer would specify the rating on a paper label fixed to the tire tread. A technical meeting was held in November 1971, when many individuals and organizations presented views, comments, and data.

Compliance test facility

Heretofore, NHTSA compliance testing has been carried out in 13 private research laboratories. A major development in 1971 was the selection, and Congressional approval, of a Government facility where vehicles and their equipment could be scientifically tested. It will be located at the Ohio Highway Transportation Research Center at East Liberty. Funds for construction and equipment ($9.6 million) are included in FY 1972 appropriations. The facility will furnish NHTSA with the capability to conduct tests in support of standards enforcement and defects investigation programs. It will also permit the development of test procedures and requirements for proposed standards.

Safety systems laboratory

By agreement between the Departments of Commerce and Transportation, the former Automotive Safety Research Laboratory of the Bureau of Standards was transferred to DOT and forms part of NHTSA's research capability. The Laboratory is doing research and testing primarily on tires, anthropometric dummies, brakes, and occupant restraints with principal emphasis on tires and human simulators (dummies).

Information data system

This system for the collection, analysis and exchange of traffic accident information has been designed to enable the Federal Government to access from and interact with systems in the 50 States, and to permit the States to similarly

access from and interact with one another and the Federal Government. The two principal components of the system are: 1) the National Accident Summary File, which is now fully operational, and 2) the Fatality Analysis File, which is now becoming operational.

Fleet test research

Two major fleet research programs have been planned: passive restraint fleet tests, and automotive crash recorder fleet research. The passive restraint fleet tests are underway. The results will be used to:

- Evaluate maintainability and effectiveness of passive restraint systems under operating conditions.
- Identify unforeseen events from "on-the-road" use.
- Develop support for FMVSS 208 (occupant crash protection).
- Develop data collection, analysis, and evaluation techniques.
- Assess maintenance and periodic inspection techniques.
- Establish fleet test procedures.

It is hoped that the automotive crash recorder fleet research program will be initiated in FY 1973. This program will provide the first opportunity to:

- Obtain quantitative precrash and crash data.
- Relate laboratory crash tests to actual accidents.
- Validate theory/models of accident dynamics with fatality and injury prevention measures.
- Assist in preparation of FMVSS.

Defects investigation contractor program

The growing number of cars produced since the initial FMVSS went into force, and the new and revised standards confronts NHTSA with an ever-escalating defects investigation workload which is more than its personnel can handle. The Administration has initiated a contractor-investigations program to substantially augment its investigative capability. Automobile clubs are used to carry out investigative projects; and, field investigations are carried out by contractors to secure facts on safety-related defects reported by vehicle owners.

Vehicle structures crashworthiness programs

Research and testing done in previous years showed that effective occupant protection through improved vehicle structures is possible. A new program phase was initiated aimed at developing actual protective systems. Working structural systems are necessary to demonstrate to industry and to the motoring public that substantially improved levels of protection are not only theoretically possible, but also technologically feasible.

Programs are underway to determine production feasibility of concepts for front, side, rear, and rollover protection. Many of the concepts, as designed and built, are satisfactory for research purposes but need modification to make them compatible with mass production techniques, and to ensure compatibility among the vehicle's operational systems and normal vehicle usage.

Consumer protection bulletins

This publication is an alert notice to inform vehicle owners of special safety hazards which have been identified by make and model, together with the cause and remedy, in instances where NHTSA has not yet completed its investigation. It is given the widest possible circulation through press, radio and other channels of communication. It is used sparingly, and has been invoked in only five instances: 1) possible failure of Ford lower control arm; 2) a danger of fumes from Corvair heaters; 3) a possibility of Chevrolet engine mount failure; 4) Mack truck reall; and, V. W. windshield wipers.

Consumer complaints, response, and referral

A new service has been established whereby NHTSA responds to all consumer inquiries, complaints and submissions of safety information. Each complaint is sent to the manufacturer together with a request for an action report to the Administration. The customer is then informed of what NHTSA has done and the manufacturer's office from which a report has been requested. The manufacturers have been most cooperative so that a record of satisfactory conclusion in between 65 and 80 percent of the cases. It has also created a new awareness at the highest levels of manufacturing personnel of the everyday problems of the motorist. The executive is able to track consistent weaknesss in his product at an early stage, and scrutinize dealer services more critically. It is a new dialogue between the vehicle maker and user which is proving beneficial where it

counts—on the production line, and in the service garages. This consumer protection program is growing rapidly.

Program priority analysis

Safety programs are numerous and vary widely, both in cost and in their potential for saving lives and preventing injuries. Based on projected maximum benefits—lives saved—and available resources—cost—NHTSA is developing advanced analytical techniques to permit the assignment of priorities among the various safety programs. Two specific applications of these techniques are: (1) estimates of costs versus gains of motor vehicle standards for passenger cars scheduled to become effective between 1972 and 1976, with residual benefits beyond 1980 included:

Total benefits (billion)	$76
Total costs (billion)	$28
Total net benefit (billion)	$48
Benefit-cost ratio	2.7:1

(2) evaluation of potential benefits from improved occupant crash protection resulted in a stepped-up program. Net benefits forecast: $25 billion.

On these and other bases, NHTSA has identified the principal priority programs, and 72 percent of its contract research budget has been channeled to their support. They are:

- Crash Survivability
- Alcohol Countermeasures Program
- Experimental Safety Vehicles

Statutory Means of Publicizing Public Advisories

Question. I am concerned with the problem of getting information relating to defects from NHTSA and manufacturers to the public. During the authorization hearings, I directed several questions to you regarding use of Consumer Protection Bulletins and Public Advisories, for which you provided answers for the Record. Do you currently have the legal authority to publish, the Advisories in the print and electronic media?

Answer. Under the Act, the NHTSA could attempt to ensure that the public became aware of a particular public advisory by issuing press releases to wide variety of members of the printed and electronic media. Of course, whether the media carried the public advisory would be a decision entirely belonging to the media. We do not understand the Act as authorizing us to purchase space in the printed media or time in the electronic media for the purpose of publicizing these advisories.

Statutory Means of Defect Notification

Question. Do you currently have the legal authority to require defect notification through the print and electronic media?

Answer. The only type of defect notification which can be required of the manufacturers under the National Traffic and Motor Vehicle Safety Act is clearly described in section 113(b). That subsection provides that first purchasers are to be notified by certified mail and that dealers are to be notified by certified mail or other more expeditious means.

Defect Notification

Question. Would this authority aid in the notification of those consumers who for one reason or another, never received their defect notification?

Answer. Press releases, advisories and bulletins are regularly transmitted to the print and electronic media for publication. However, since such publication is at the discretion of the media, information supplied by the NHTSA is not always picked up. We do not believe that the role of the Federal government should include regulation of the media. Rather, the media should be encouraged to make public our notices of defects to assure the widest possible dissemination of this important, often critical, information.

Enforcement Activities

Question. Another point of concern regarding safety defects is the speed with which recalls are effectuated. This is a matter which concerns me greatly because I get literally scores of letters from consumers who attempt to have a defect re-

paired only to find that the dealer refuses to do it or the parts are unavailable. What percent of vehicles subject to recalls are actually repaired?

Answer. Not all vehicles subject to a recall contain a defect. Rather, they belong to a suspect group of vehicles that must be inspected to determine if they require corrective action. Overall, an average of approximately 75% of all vehicles involved in defect notification campaigns are inspected and corrected where required. Those campaigns involving large numbers of older vehicles generally fall well below that average.

Repair of Defective Vehicles

Question. What good does it do to send out recall notices if the repairs aren't done?

Answer. Recall notices alert owners of the safety defect in their vehicles and warn them of the unsafe driving condtions caused by such defect. Such notification is required by law and provides essential information to consumers about their vehicles. Unfortunately, many owners do not heed these warnings and never take their vehicles to be repaired. We do not have the authority, nor do we seek the authority, to require that owners have their vehicles repaired. This is an individual decision.

On the other hand, the majority of owners do bring their vehicles into appropriate dealerships in order to have the defect remedied. But they often are frustrated in their efforts. Dealers frequently are unable to perform the repairs due to lack of necessary parts. Some dealers flatly refuse to perform the needed repairs. This is a serious problem that must be resolved in order to assure repair of all defective vehicles.

Oversight of Recall Campaigns

Question. Since NHTSA has no authority at present to require recall, are you powerless to oversee problems such as these?

Answer. Under the authority of sections 112, 113, and 119, the NHTSA issued on February 11, 1971, a regulation requiring manufacturers to provide the NHTSA with detailed information concerning campaigns to recall and remedy potentially defective vehicles. (Copy attached.) On a quarterly basis, the manufacturers are required to furnish certain information concerning current campaigns, including the following: date owner notification begun and completed; numbers of vehicles involved; number of vehicles known or estimated to contain the defect; numbers of vehicles inspected by or at the direction of the manufacturer; number of inspected vehicles found to contain the defect; number of vehicles for which corrective measures have been completed; and number of vehicles determined to be unreachable for inspection due to exportation, theft, scrapping or for other reasons.

Where a manufacturer's campaign to inspect for and correct safety defects appeared to be lagging seriously, the NHTAS could urge the manufacturer to increase the pace of his voluntary campaign. The NHTSA could not, however, compel the manufacturer to do so. The NHTSA might also issue a public advisory or other notice urging affected members of the public to have their cars inspected.

Further, the information received by the NHTSA pursuant to the defect campaign regulation would enable the NHTSA to determine whether any additional action, administrative or legislative, might be warranted. Finally, the NHTSA has proposed regulations to increase the effectiveness of defect notifications. As a result, an improvement in recall and remedy campaigns is anticipated.

[From the Congressional Record, Feb. 17, 1971]

TITLE 49—TRANSPORTATION

CHAPTER V—NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

(Docket No. 69-31; Notice No. 2)

Part 573—Defect Reports

On December 24, 1969, a notice of proposed rulemaking entitled, "Defect Reports", was published in the FEDERAL REGISTER (34 F.R. 20212). The notice proposed requirements for reports and information regarding defects in motor vehicles, to be submitted to the National Highway Traffic Safety Administra-

tion by manufacturers of motor vehicles pursuant to sections 112, 113, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1401, 1402, and 1407).

The notice requested comments on the proposed requirements. All comments received have been considered and some are discussed below.

Several comments asked whether both the fabricating manufacturer and the importer of imported vehicles were required to comply with all the proposed requirements. A similar question was asked in regard to manufacturers of incomplete vehicles and subsequent manufacturers of the same vehicles. In response to the comments, § 573.3 provides that in the case of imported vehicles, compliance by either the fabricating manufacturer or the importer of the imported vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both. In the case of vehicles manufactured in two or more stages, compliance by either the manufacturer of the incomplete vehicle or one of the subsequent manufacturers of the vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both the incomplete vehicle manufacturer and the subsequent manufacturers.

Many comments requested that the time for the initial filing of the direct information report be increased to allow opportunity for the extensive and complex testing often necessary to determine whether a defect is safety-related. As proposed, the time for initially filing the report was within 5 days after the discovery of a defect that the manufacturer subsequently determined to be safety-related. In response to these comments, § 573.4(b) provides that the report shall be submitted by the manufacturer not more than 5 days after he or the Administrator has determined that a defect in the manufacturer's vehicles relates to motor vehicle safety.

Several comments requested the deletion of one or more items of information proposed for inclusion in the defect information report. Objections to providing an evaluation of the risk of accident due to the defect, a list of all incidents related to the defect, and an analysis of the cause of the defect were based on the ground that the information would be inherently speculative. The proposed requirements for these three items of information have been deleted. In place of the list of incidents, § 573.4(c)(6) requires a chronology of all principal events that were the basis for the determination of the existence of a safety-related defect. In accordance with the deletion of the list of incidents, the provision in the proposal requiring quarterly reports to contain information concerning previously unreported incidents has also been deleted.

Several comments stated that the requirement in the proposal for the submission of a copy of all communications sent to dealers and purchasers concerning a safety-related defect would create an unreasonable burden on the manufacturers. The comments reported that the manufacturers would be required to submit to the Administration a large volume of useless correspondence between the manufacturers and individual dealers or purchasers. To mitigate this problem, § 573.4(c)(8) provides that the manufacturers shall submit to the Administration only those communications that are sent to more than one dealer or purchaser. For the same reason, the requirement in § 573.7 that a manufacturer submit a copy of all communications, other than those required under § 573.4(c)(8), regarding any defect, whether or not safety-related, in his vehicles, is also limited to communications sent to more than one person.

Many comments requested that a regular schedule for submitting quarterly reports be established. They suggested that this be accomplished by requiring that the first quarter for submitting a quarterly report with respect ot a particular defect be the calendar quarter in which the defect information report for the defect is initially submitted. As proposed, the first quarter began on the date on which the defect information report was initially submitted. Several of these comments also objected to the proposed requirements for submitting both quarterly reports and annual defect summaries on the ground that the latter would be partially redundant. In response to these comments, the proposed requirement for filing a separate series of quarterly reports for each defect notification campaign has been deleted. Instead, § 573.5(a) requires that each manufacturer submit a quarterly report not more than 25 working days after the close of each calendar quarter. The information specified in § 573.5(c) is required to be provided with respect to each notification campaign, beginning with the quarter in which the campaign was initiated. Unless otherwise directed by the Administration, the information for each campaign is to be included in the

quarterly reports for six consecutive quarters or until corrective action has been completed on all defective vehicles involved in the campaign, whichever occurs sooner.

The proposed requirement for filing annual summaries has been deleted. Instead, § 573.5(d) requires that the figures provided in the quarterly reports under paragraph (c) (5), (6), (7), and (8) of § 573.5 be cumulative. In addition, § 573.5(b) requires that each quarterly report contain the total number of vehicles produced during the quarter for which the report is submitted.

Several changes have been made for the purpose of clarification. § 573.4(c) (8) requires that manufacturers submit three copies of the communications specified in that section. In response to questions concerning the use of computers for maintaining owner lists, a reference to computer information storage devices and card files has been added to § 573.6 to indicate that they are suitable. A reference to first purchasers and subsequent purchasers to whom a warranty has been transferred, and any other owners known to the manufacturer, has been added to the same section to make clear that the owner list is required to include both types of purchasers as well as other known owners.

In consideration of the above, Title 49 of the Code of Federal Regulations is amended by the addition of a new Part 573—Defect Reports, as set forth below.

Effective date: August 16, 1971.

Issued on February 10, 1971.

DOUGLAS W. TOMS,
Acting Administrator,
National Highway Traffic Safety Administration.

Sec.

573.1 Scope.
573.2 Purpose.
573.3 Application.
573.4 Defect information report.
573.5 Quarterly reports.
573.6 Owner lists.
573.7 Notices, bulletins and other communications.
573.8 Address or submitting all required reports and other information.

AUTHORITY: The provisions of this Part 573 issued under secs. 112, 113, and 119. National Traffic and Motor Vehicle Safety Act of 1966, as amended, 15 U.S.C. 1401, 1402, 1407; delegation of authority at 49 CFR 1.51, 35 F.R. 4955.

§ 573.1 Scope.

This part specifies manufacturer requirements for reporting safety-related defects to the National Highway Traffic Safety Administration, providing quarterly reports on defect notification, providing copies of communications with dealers and purchasers concerning defects, and maintaining owner lists.

§ 573.2 Purpose.

The purpose of this part is to enable the Administration to conduct a continuing analysis of the adequacy of manufacturers' defect notifications and corrective action, and the owner response, and to compare the defect incidence rate among different groups of motor vehicles.

§ 573.3 Application.

This part applies to all manufacturers of complete or incomplete motor vehicles. In the case of vehicles manufactured outside the United States, the term "vehicles" herein refers to vehicles imported into the United States, and compliance by either the fabricating manufacturer or the importer of the vehicle with §§ 573.4 and 573.5, with respect to a particular defect, shall be considered compliance by both. In the case of vehicles manufactured in two or more stages, compliance by either the manufacturer of the incomplete vehicle or one of the subsequent manufacturers of the vehicle with §§ 573.4 and 573.5, with respect to a particular defect, shall be considered compliance by both the incomplete vehicle manufacturer and the subsequent manufacturers.

§ 573.4 Defect information report.

(a) Each manufacturer shall furnish a defect information report to the Administration for each defect in his vehicles that he or the Administrator determines to be related to motor vehicle safety.

(b) Defect information reports required under paragraph (a) of this section shall be submitted not more than 5 working days after a defect in a ve-

hicle has been determined to be safety-related. Items of information required by paragraph (c) of this section that are not available within that period shall be submitted as they become available. Each manufacturer submitting new information relative to a previously submitted report shall refer to the notification campaign number, after such number has been assigned by the Administration.

(c) Except as provided in paragraph (b) of this section, each defect information report shall contain the following information:

(1) Name of manufacturer: The full corporate or individual name of the fabricating manufacturer of the vehicle shall be spelled out, except that such abbreviations as "Co." or "Inc." and their foreign equivalents, and the first and middle initials of individuals, may be used. In the case of imported vehicles the corporate or individual name of the agent designated by the fabricating manufacturer pursuant to section 110(e) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1399(e)) shall also be indicated. If the fabricating manufacturer is a corporation that is controlled by another corporation that assumes responsibility for compliance with all requirements of this part, the name of the controlling corporation may be used.

(2) Identifying classifications of the vehicles potentially affected by the defect including make, model, model year if appropriate, any other data necessary to describe the affected vehicles, and the inclusive dates (month and year) of manufacture.

(3) Total number of vehicles potentially affected by the defect, and the number in each classification set forth under subparagraph (2) of this paragraph.

(4) Estimated percentage of the potentially affected vehicles that contains the defect.

(5) Description of defect, including both a brief summary and a detailed description, with graphic aids as necessary, of the nature and physical location of the defect.

(6) Chronology of all principal events that were the basis for the determination of the existence of a safety defect, including all warranty claims, field service bulletins and other information, with their dates of receipt.

(7) Statement of measures to be taken to repair the defect.

(8) Three copies of all notices, bulletins, and other communications that are sent to more than one dealer or purchaser and relate directly to the defect. These copies shall be submitted to the Administration not later than the time at which they are initially sent to dealers or purchasers.

§ 573.5 Quarterly reports.

(a) Each manufacturer shall submit to the Administration a quarterly report not more than 25 working days after the close of each calendar quarter.

(b) Each report shall contain the total number of the manufacturer's vehicles by make, model, and model year if appropriate, produced or imported during that quarter.

(c) The following information shall be included in the quarterly reports, under the numbers and headings indicated, with respect to each notification campaign for the period of time specified in paragraph (e) of this section:

(1) Notification campaign number.

(2) Date owner notification begun, and date completed.

(3) Number of vehicles involved in notification campaign.

(4) Number of vehicles known or estimated to contain the defect.

(5) Number of vehicles inspected by or at the direction of the manufacturer.

(6) Number of inspected vehicles found to contain the defect.

(7) Number of vehicles for which corrective measures have been completed.

(8) Number of vehicles determined to be unreachable for inspection due to exportation, theft, scrapping or for other reasons (specify).

(d) If the manufacturer determines that the original answers for paragraph (c) (3) and (4) of this section are incorrect, revised figures and an explanatory note shall be submitted. If the nature of the defect prevents determination of the number of inspected vehicles that are defective, the manufacturer shall submit a brief explanation. Answers to paragraph (c) (5), (6), (7), and (8) of this section shall be cumulative totals.

(e) Unless otherwise directed by the Administration, the information specified in paragraph (c) of the section shall be included in the quarterly reports, with respect to each notification campaign, for six consecutive quarters beginning

with the quarter in which the campaign was initiated or until corrective action has been completed on all defective vehicles involved in the campaign, whichever occurs sooner.

§ 573.6 Owner lists.

Each manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, a list of the names and addresses of first purchasers or subsequent purchasers to whom a warranty has been transferred, and of any other owners known to the manufacturer, and the vehicle identification numbers for all his vehicles involved in each safety defect notification campaign initiated after the effective date of this part. The list shall show the status of inspection and defect correction with respect to each vehicle involved in each campaign, updated as of the end of each quarterly reporting period required in paragraph (e) of § 573.5. The completed list shall be retained for 5 years after the date on which the defect information report is initially submitted to the Administration.

§ 573.7 Notices, bulletins and other communications.

Each manufacturer shall furnish the Administration a copy of all notoices, bulletins, and other communications, other than those required to be submitted under § 573.4(c)(8), sent to more than one dealer or purchaser of his vehicles regarding any defect, whether or not safety-related, in such vehicles. These copies shall be submitted monthly not more than 5 working days after the close of each month.

§ 573.8 Address for submitting all required reports and other information.

All required reports and other information shall be submitted to: Office of Compliance National Highway Traffic Safety Administration, Washington, D.C. 20591.

[From the Congressional Record, May 15, 1972]

PROPOSED RULEMAKING

National Highway Traffic Safety Administration

(49 CFR Part 577)

(Docket No. 72–7; Notice 1)

DEFECT NOTIFICATION

Proposed Requirements for Letters Sent by Manufacturers to Purchasers

The purpose of this notice is to propose requirements for letters sent by manufacturers of motor vehicles and motor vehicle equipment pursuant to section 113 of the National Traffic and Motor Vehicle Safety Act, which advise purchasers of the possibility that motor vehicles or items of motor vehicle equipment which they purchased may contain a defect that relates to motor vehicle safety. In May 1971, letters were sent by NHTSA to 78 motor vehicle manufacturers suggesting guidelines for defect notification letters sent pursuant to section 113 of the Act. In January 1972, a petition for rule making regarding this subject was received from Mr. Ralph Nader. This notice is based both on the guidelines suggested by NHSTA and the petition submitted by Mr. Nader.

Section 113 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402) provides for notification of owners regarding safety related defects in motor vehicles or items of motor vehicle equipment in two distinct schemes. The first, section 113(a) (15 U.S.C. 1402(a)) provides for notification by a motor vehicle or tire manufacturer when he determnies that a motor vehicle or item of motor vehicle equipment he has manufactured contains a defect which relates to motor vehicle safety. The notification must be sent by certified mail to the first purchaser (where known) within a reasonable time. The second source for notification letters (section 113(e), (15 U.S.C. 1402(e)) arises from a determination by the NHTSA Administrator that either a defect relating to motor vehicle safety or a failure to comply with an applicable motor vehicle safety standard exists in either a motor vehicle or item of motor vehicle equipment. When the Administrator makes such a determination, the notification requirements can apply either to a motor vehicle or motor vehicle equipment manpufacturer. Regardless of whether the notification is voluntary or directed, it is required by section 113(c) of the Act (15 U.S.C. 1402(c)) to clearly describe the defect, eval-

uate the risk it presents to traffic safety, and provides a statement of measures to be taken to repair the defect.

The NHTSA letter of May 1971 noted that the primary purpose of the section 113 requirements is to facilitate the prompt correction of safety related defects. To achieve this end, the letter stated, "notification letters must create an incentive in owners to have their vehicles repaired as quickly as possible." Based upon a review of letters sent to purchasers over the last several years, the NHTSA found at the time that many notification letters had been inadequate in attempting to provide the desired incentive in owners.

In drafting the May letter, the NHTSA had considered at that time the alternative of a regulation setting forth requirements for these letters. It was decided, however, that manufacturers should be provided an opportunity to voluntarily make their notification letters more consistent with the spirit and intent of the National Traffic and Motor Vehicle Safety Act. Since the mailing of the industry letter, however, while in some cases an attempt to follow the guidelines has been noted, there has not been, in the opinion of NHTSA, a significant improvement in letters sent by manufacturers. As a consequence, the NHTSA believes the public interest would best be served by the issuance of regulatory requirements for notification letters.

As proposed, the requirements specify that the notification letter begin with the statement that it is being sent pursuant to the requirements of the National Traffic and Motor Vehicle Safety Act. This statement would be required because, as indicated in the industry letter of May 1971, the NHTSA believes that the public would be more inclined to view a safety defect as a safety hazard if it were advised at the outset that the notification is required by a Federal statute. The letter would also be required to state that the manufacturer or the Administrator of NHTSA whichever is appropriate, had determined that a defect existed. Where the determination had been made by the Administrator, the manufacturer would be prohibited from including any statements in this or any contemporaneous communication that the manufacturer disagreed with the finding of the Administrator.

In meeting the statutory requirement that the notification clearly describe the defect, the regulations would require that such description include a list of the items of motor vehicle equipment affected, a description of the possible malfunction, a statement of operating or other conditions that may cause it to occur, and steps the owner could take to reduce the chance of this occurrence before the vehicle is repaired.

The requirement that the notification evaluate the risk to traffic safety was one which was ignored or misinterpreted by many notification letters. Its importance in emphasizing serious defects is important as even the most catastrophic vehicle failure can be described in terms of almost neutral significance when manufacturers so desire. As a consequence, the regulations would require the evaluation to distinguish between crash and noncrash situations, and provide, when vehicle crash could be expected to result from the defect, a specific statement to that effect. When the driver can be expected to experience some sort of warning the notification would provide a full description of the warning. In cases where other than vehicle crash can be expected to result, such as a case of exhaust fume leakage, the type of injury that can result would also be stated.

The third statutory requirement for notification letters is a statement of measures to be taken to repair the defect. The proposed regulations would require differing statements depending upon whether the manufacturer assumes complete responsibility for repairing the defect. If he does assume the responsibility, the manufacturer must describe generally the work involved in making the repair, specify the date by which the purchaser's dealer will be supplied with the parts and instructions for correcting the defect, and include an estimate of the time reasonably necessary to perform the actual work.

The information that must be provided to consumers regarding measures to be taken to repair the defect would be more extensive where either the manufacturer's dealers will not necessarily make the repairs, or where the manufacturer refuses to pay for the repair. In the former situation, which may arise in cases where dealers are relatively few and widely scattered, the information must include sufficient guidance for a competent person not particularly familiar with the vehicles in question to make the repairs properly. To do so, the NHTSA believes that the notification should include the name and part number of needed parts, descriptions of modifications to existing parts, location where parts can be obtained, including dates by which they will be available, a detailed descrip-

tion of each step required to correct the defect, and recommendations as to whom the purchaser should contact to have work performed.

In the case where manufacturers refuse to pay for the necessary repairs, the manufacturer is also required to provide in addition to this information, additional information regarding the cost to the consumer of having the repair performed. While the petitioner suggested that this information be provided in all cases, the NHTSA is of the opinion that cost information is valuable for a vehicle owner mainly in those situations where he must pay for the repair. The cost information required to be furnished would include the retail cost for all needed parts and the manufacturer's estimate of the total cost to the consumer, including parts and labor, the latter being estimated according to the prevailing labor charges of the manufacturer's dealers in the vicinity of the purchaser.

In the case of the notification letters sent pursuant to either the request or the direction of the Administrator, the notification is to be the same as that when initiated by the manufacturer except as the NHTSA, based upon information obtained pursuant to its investigation in the particular proceeding, may provide.

In light of the above, it is proposed that a new Part 577, "Defect Notification," be added to Chapter 5 of Title 49, Code of Federal Regulations, to read as set forth below.

Interested persons are invited to submit comments on the proposed requirements. Comments should identify the docket number and be submitted to: Docket Section, National Highway Traffic Safety Administration, Room 5221, 400 Seventh Street SW., Washington, DC 20590. It is requested but not required that 10 copies be submitted.

All comments received before the close of business on August 14, 1972 will be considered and will be available for examination in the docket at the above address both before and after the closing date. To the extent possible, comments filed after the above date will also be considered by the Administration. However, the rule making action may proceed at any time after that date, and comments received after the closing date and too late for consideration in regard to the action will be treated as suggestions for future rule making. The Administration will continue to file relevant material, as it becomes available, in the docket after the closing date, and it is recommended that interested persons continue to examine the docket for new materials.

Proposed effective date: October 15, 1972.

This notice of proposed rule making is issued pursuant to the authority of sections 108, 113, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1397, 1402, 1408) and the delegations of authority at 49 CFR 1.51 and 501.8.

Issued on May 12, 1972.

ROBERT L. CARTER,
Acting Associate Administrator,
Motor Vehicle Programs.

Part 577—Defect notification

§ 577.1 Scope.

This part sets forth requirements for letters from manufacturers of motor vehicles and motor vehicle equipment to notify first purchasers of the possibility of a defect relating to motor vehicle safety or a noncompliance with a Federal motor vehicle safety standard.

§ 577.2 Purpose.

The purpose of this part is to ensure that defect notification letters provide adequate information to their recipients, and effectively motivate owners of possibly defective or noncomplying motor vehicles or items of motor vehicle equipment to have vehicles and equipment inspected and, where necessary, repaired as quickly as possible.

§ 577.3 Application.

This part applies to manufacturers of complete motor vehicles, incomplete motor vehicles, and motor vehicle equipment.

§ 577.4 Notification initiated by manufacturer.

Whenever a manufacturer of motor vehicles or tires determines that a defect in any vehicle or item of motor vehicle equipment he produces relates to motor vehicle safety, he shall notify by certified mail the purchaser (where known) of such vehicle or item of motor vehicle equipment, and any subsequent pur-

chaser to whom a warranty on such vehicle or item of equipment has been issued. The notification shall contain the following information in the form and in the order specified:

(a) A statement: "This letter is sent to you pursuant to the requirements of the National Traffic and Motor Vehicle Safety Act."

(b) The statement: "[Manufacturer's name or division] has determined that a defect which relates to motor vehicle safety exists in [the year, make, and model of motor vehicle; or model or part number of motor vehicle equipment]."

(c) A clear description of the defect, which must include—

(1) A list of the particular item or items of motor vehicle equipment affected;

(2) A description of the malfunction that may occur;

(3) A statement of any operating or other conditions that may cause the malfunction; and

(4) Precautions the owner should take to reduce the chance that the malfunction will occur before the vehicle is repaired.

(d) An evaluation of the risk to traffic safety reasonably related to the defect which must include—

(1) When vehicle crash is the potential occurrence, whichever of the following statements is appropriate:

(i) That the defect can cause the driver to lose control of his vehicle without any prior warning; or

(ii) A description of whatever warning may occur, and a statement that if such warning is not recognized or heeded, that the defect can cause the owner to lose control of his vehicle.

(2) When vehicle crash is not the potential occurrence, a statement indicating the type of injury to occupants of the vehicle or to persons outside the vehicle that can result from the defect.

(e) A statement of measures to be taken to repair the defect, in accordance with whichever of the following is appropriate.

(1) When the manufacturer offers to repair the defect through his dealers without charge to the purchaser, the statement shall include:

(i) A general description of the work involved in repairing the defect;

(ii) The date by which the purchaser's dealer will be supplied with parts and instructions for correcting the defect; and

(iii) An estimate of the time reasonably necessary to perform the labor required to correct the defect.

(2) When the manufacturer offers to pay for the repair either directly or through reimbursement to the owner, but does not provide for the repairs to be performed by the manufacturer's dealer, the statement shall include—

(i) The name and part number of each part that must be added, replaced, or modified;

(ii) A description of any modifications that must be made to existing parts;

(iii) Instructions on how needed parts will be made available, including a location where the purchaser can obtain the parts, and the date by which they will be available at that location.

(iv) A detailed description (including appropriate illustrations) of each step required to correct the defect;

(v) An estimate of the time reasonably necessary to perform the labor required to correct the defect; and

(vi) Recommendations as to whom the purchaser should have perform the necessary work.

(3) When the manufacturer does not provide for payment of the repair, the statement shall include—

(i) The name, part number, and retail cost of each part that must be added or replaced;

(ii) A description of any modifications that must be made to existing parts, which must also be identified by name and part number;

(iii) Instructions on how needed parts will be made available, including a location where the purchaser can obtain the parts, and the date by which the parts will be available at that location;

(iv) A detailed description (including appropriate illustrations) of each step required to repair the defect;

(v) An estimate of the time reasonably necessary to perform the labor required to correct the defect;

(vi) Recommendations as to whom the purchaser should have perform the necessary work; and

(vii) The manufacturer's estimate of the total cost to the purchaser to have the work performed, which shall be based on the price for all new parts, and a charge for labor commensurate with that charged by the manufacturer's dealers in the vicinity of the purchaser's address.

§ 577.5 Notification conducted pursuant to direction of the Administrator.

A notification made as a result of proceedings conducted pursuant to section 113(e) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402(e)) shall be made in the manner specified in § 577.4 except as otherwise provided in a directive issued by the Administrator requesting or requiring a manufacturer to furnish notification to first purchasers.

§ 577.6 Disclaimers.

No letter sent pursuant to § 577.4 or § 577.5, nor any other contemporaneous communication, shall contain any statement or implication that the problem discussed in the letter is not a defect or that it does not relate to motor vehicle safety.

In the case of letters sent pursuant to § 577.5, the letter shall not state or imply that the manufacturer disagrees with the Administrator's finding that a defect relating to motor vehicle safety exists.

§ 577.7 Penalties.

Failure of a defect notification letter to comply with this part constitute a violation of sections 108 and 113 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1397, 1402).

Implementation of Mandatory Recall

Question. If the Congress adopts the mandatory recall provision, would it be amended to include authority for NHTSA to set standards on how a recall is to be carried out or do you currently have sufficient authority to encompass this?

Answer. If the Congress were to adopt a mandatory recall and remedy provision, the NHTSA could issue implementing regulations pursuant to that provision and the general rulemaking authority provision in section 119 of the Act. The breadth of such regulations might be affected by the wording of the recall and remedy provision and accompanying legislative history.

Tire Registration

Question. The 1970 amendments to the National Traffic and Motor Vehicle Safety Act of 1966 require the registration of all new tires sold. NHTSA regulation requires registration of tires manufactured after May 22, 1972. I plan to submit for the record at this time an exchange of letters between Senator Nelson and Mr. Toms regarding the progress to date on the tire registration requirements. On page 4 of your letter, you state that NHTSA is considering various ways of facilitating and increasing the effectiveness of the tire registration process, including standardization of forms. Is standardization still considered feasible? How far along are you?

Answer. The feasibility of standardizing tire registrations is under study at this time.

Civil Penalties Against Tire Distributors and Dealers

Question. You have proposed an amendment to section 108 of the act allowing for civil penalties against distributors and dealers for violating registration requirements of NHTSA. Is this sufficient to insure compliance?

Answer. The proposed amendment to section 108 of the Act allowing civil penalties against distributors and dealers for violating the registration requirements will provide stronger enforcement options at what is recognized by those nearest to the problem as the weakest link in the registration chain. Strong enforcement action in this area can improve the level of compliance significantly.

Authority To Enforce Tire Identification Regulations

Question. Are any other legislative initiatives required to insure that the requirements are complied with?

Answer. We believe that our proposed amendment to section 108 of the Act would, by clearly providing that violation of any rule or regulation issued under

the Act was a violation of the Act, remove any doubt that the NHTSA possesses the authority to enforce the tire identification regulations. We do not believe that adoption of additional amendments would be necessary at this time.

Percentage of Tires Sold and Registered

Question. In a March 13, 1972 article appearing in the Detroit News, Dr. Edward Wallace of the tire division of NHTSA estimated only 35–50 percent of the tires sold are being registered. Is this statistic still an accurate estimate?

Answer. As indicated in Mr. Toms' letter of June 26, 1972, addressed to the Honorable Gaylord Nelson which, we understand, is already part of the record, the exact extent of noncompliance cannot presently be determined with any certainty. Our latest survey conducted in April of this year involving eight major tire manufacturers examined registration data for the period June 1971 through February 1972. In one case, registration against sales was indicated as a low of 6% for February, although a high of 16% was indicated earlier in the program last October. In the other seven cases, February figures indicated a 35% to 38% registration figure. Sales figures, of course, include many tires manufactured prior to May 1971, which are not required to be registered under the regulation. It should be recognized that it takes an estimated two to three years to purge the marketing distribution pipeline of tires, depending upon the size and production of the company. As the older tires not subject to the regulation are purged from the system, it will be possible to collect more meaningful data relative to the overall compliance picture.

Effectuating Tire Recalls

Question. I am concerned with the speed with which tire recalls are effectuated. I want to cite to you six tire recalls announced since January, 1971.

June 20, 1972: B. F. Goodrich—tires manufactured between Jan.–Dec. 1968. May 14, 1972: Mansfield Tire and Rubber Co.—tires manufactured late 1969–early 1970. May 24, 1972: Uniroyal Tire Company—tires manufactured late 1969, early 1970. May 31, 1971: Mansfield Tire and Rubber Co.—tires manufactured June 1969—Jan. 1971. February 8, 1971: Uniroyal Tire Company—tires manufactured in 1968. January 8, 1971: Seiberling Tire and Rubber Co.—tires manufactured in 1968. Why does it take so long for NHTSA to order?

Answer. In general, with more effective methods of purchasing, testing tires, and enforcing defect notifications where necessary, the time between production date and defect notification date is constantly being shortened. It should be recognized, however, that investigation beyond the point of intial failure is required in all cases in order to clearly establish that a noncompliance does exist and to define, for purposes of notification, the volume of tires involved. A manufacturer is also entitled to present his case before an NHTSA determination to notify is made. Where a difference of opinion is present relative to the merits of a particular case the technical and legal discussion involved can often be complex and protracted.

Manufacturer's Advantage in Stalling Recalls

Question. Isn't it to the advantage of the manufacturer to stall the recalls since they replace defective tires on a prorated basis based on the tread wear of the tire?

Answer. While it could be hypothesized that it would be to a manufacturer's advantage to stall recalls on the premise that the cost of replacement tires is prorated to the consumer based on the treadlife remaining at the time replacement is made, in our experience, we have not found this to be the case. Once a problem has been clearly established, it would, in our opinion, be in the best interest of the manufacturer to lessen the potential impact of related product liability suits by getting the tires involved off the road as soon as possible.

Enforcement Activities

Question. Do manufacturer's statistics regarding the degree to which defective vehicles are being repaired substantially agree with those of NHTSA?

Answer. The results of NHTSA audits, which sample the campaign completion rates, show slightly higher completion figures (approximately 79%) than those reported by the manufacturer (approximately 69%).

Question. Did the robot used in the driving test reflect the skills and ability of a driver of average skill and proficiency or that of a highly skilled and professional driver?

Answer. The robot used in the NHTSA input-response test did not reflect the ability or skill or proficiency of any particular kind of driver, skilled or unskilled. The robot was not used to measure driver ability in recovering a vehicle from a severe maneuver, but rather was used to create or induct the severe maneuver in the vehicle itself. The robot was used to provide a vehicle response designed to place it in the rollover mode. It induced a very severe input and a vehicle response, both of which could be measured quantitatively.

Question. What was the mission that the panel was empowered to perform?

Answer. The Panel was responsible for the following tasks:

A. Review NHTSA report on General Motors' documents, "Analysis of 1960–1963 Corvair Handling and Stability" December 4, 1970.

B. Review NHTSA report of tests conducted at Texas A&M. "Input Response Tests of Selected Small Vehicles."

C. Review related literature on vehicle handling and stability, i.e., The University of Michigan, Highway Safety Research Institute report, "Vehicle Handling Test Procedures," Contract FH–11–7297 September 1970; Cornell Aeronautical Laboratory, Inc., report, "Standards for Safe Handling Characteristics of Automobiles," July 1968; and, Digitek Corporation report, "State-of-the-Art Definition of Vehicle Handling," Contract No. FH–11–7315, April 1970.

D. Conduct actual evaluation of vehicle performance, as required.

E. Arrive at findings, conclusions and recommendations about past and future NHTSA programs for evaluation of 1960–1963 Corvair handling and stability.

Addendum

Review additional information received by NHTSA subsequent to the Panel meeting and provided revised report if appropriate.

Question. Under what authority did the panel make comments with regard to the stability characteristics of the Corvair?

Answer. In order to determine whether any further testing by NHTSA was required, the Panel found it necessary to comment on those handling and stability charcteristics that may have led in their opinion to additional testing. Their comments were the basis for their determination that no further testing was required. Obviously, the Panel was not constrained from making any other pertinent comment they wished to offer.

Question. You stated during the hearing that Dr. Wright may have had a contract with NHTSA on an accident investigation team. Was his assignment on the panel to review the NHTSA Corvair study a conflict of interest?

Answer. At the time of selection Dr. Paul H. Wright was the Project Director of the Georgia Institute of Technology multi-disciplinary accident investigation team under contract to NHTSA. When selecting the Panel members, one criteria was to obtain recognized professionals with diversified backgrounds in various aspects of dynamics and vehicle performance. Dr. Wright was selected for his expertise in accident investigation and analysis. We do not believe a conflict of interest existed.

Question. Has Dr. Wright,-or any other member of the panel, ever done any contract work for General Motors?

Answer. Neither Dr. Paul H. Wright nor the other two Panel members, Professor Edwin L. Resler, Jr., and Mr. Ray W. Caldwell have ever done any contract work for General Motors.

Question. Did any of the panel members have any professional research experience in the field of vehicle dynamics as it relates to conventional passenger cars?

Answer. No Panel member had any direct professional research in the field of vehicle dynamics as it relates to conventional passenger cars.

Question. If no,—Since none had any background in this area do you believe that the panel was competent to analyze the NHTSA study on Corvair stability and handling?

Answer. Panel members were selected for their diversified professional backgrounds and independence from the automotive industry. We believe the Panel was competent, professional and independent in their analysis.

Question. How much will it cost the taxpayers for NHTSA to send the notification to the owners of 1960–63 Corvairs?

Answer. NHTSA plans to communicate the findings and conclusions of its Corvair Handling and Stability investigation by mailing a letter to the owners of 1960–1963 Corvairs. It is estimated that the cost of mailing this letter will be approximately $100,000.

Question. I note that at the end of the panel analysis and the NHTSA study, there are a list of documents, films, studies, etc. utilized to conduct this study. Are all communications, both written and oral, between NHTSA and the Panel and General Motors included in this listing? Please provide for the record the complete list of all materials utilized.

Answer. In addition to the materials appearing in the index to the Panel analysis and the NHTSA Corvair Report, other communication and materials used are noted in the index to our public file on the Corvair handling and stability investigation. A copy of this index is attached hereto. The only other communications or material designated and not appearing in this index are communications and documnts which have been accepted by the NHTSA as proprietary to the manufacturer (See our response to Question 52). Oral communications between the parties designated were not memorialized in writing, except on the following occasions:

1. Minutes of meeting December 20, 1971 between Panel and NHTSA.
2. Minutes of meeting January 5, 1972, between GM and NHTSA.
3. Minutes of meeting April 19, 1972, between Panel and NHTSA.

OFFICE OF DEFECTS INVESTIGATION

SECTION I
MASTER INDEX
INVESTIGATIVE FILE

Mfr: General Motors Corp.
Case No. IR-279

Make: Chevrolet
Date Opened 9-4-70

Model: Corvair
Engr. Ernest P. Wittich

Year(s): 1960-1963
Comp. Cl.

Component: Handling and Stability

Problem Description:

Handling and stability

Date	Subject
9-04-70	Letter from Ralph Nader to Sec. John Volpe concerning Corvair handling.
9-09-70	Letter to T. Murphy of GM from R. Diaz requesting information.
9-11-70	Press Release by DOT.
9-11-70	Letter to Nader from Sec. Volpe.
9-12-70	Letter to Volpe from Nader.
9-14-70	Telephone contact to GM. Request for Corvair Service Manuals.
9-15-70	Letter from GM; shop manuals received.
9-17-70	Memo to file, GM reply to NHTSA letter dated 9-9-70.
10-01-70	Letter to T. Murphy of GM from R. Diaz requesting additional information.
10-01-70	Letter to Nader requesting additional information.
10-04-70	Letter from MIRA that report is confidential and not available.

OFFICE OF DEFECTS INVESTIGATION

SECTION I
MASTER INDEX
INVESTIGATIVE FILE

Date	Subject
10-15-70	Memo to File. GM reply to NHTSA letter dated 10-01-70
10-23-70	Letter to Ribicoff from Nader.
10-27-70	Letter to Volpe from Nader.
11-05-70	Letter to Nader from Volpe. Reply to Nader letter dated October 27, 1970.
11-20-70	Memo to File. Location of reports on DOT contract FH-11-7297.
12-15-70	Letter to Volpe from Nader.
1-06-71	Memo, clearance request for information to Miss Joan Daybrook.
2-08-71	Letter to Nader from Toms.
2-23-71	Letter to Volpe from Nader.
3-14-71	Memo to File, Mr. Nader Reply to NHTSA letter dated 2-8-71.
3-17-71	Letter to Diaz from Sellers of PIRG.
3-25-71	Letter to Sellers from Diaz. Reply to letter dated 3-17-71.
4-16-71	Letter to Clark from Uniroyal with four enclosures.
5-71	Davidson Lab Report of Tire Pressure (See Section III).
5-17-71	Letter to NHTSA from GM with test proposals (See Section III).
6-03-71	Letter to Sen. Magnuson from Harley F. Copp with one enclosure.
6-15-71	Letter to Ford requesting info re Copp letter.
6-28-71	Memo to File. Ford Motor Company reply to letter of 6-15-71.
7-03-71	Letter to American Motors requesting information re Copp letter.
7-03-71	Letter to Chrysler Corp. requesting info re Copp letter
7-8-71	Letter to Sen. Rubicoff from Nader.
7-13-71	Letter from American Motors; reply to letter of 7-3-71.
7-14-71	Letter from Chrysler Corp.; reply to letter of 7-3-71.

OFFICE OF DEFECTS INVESTIGATION

SECTION I
MASTER INDEX
INVESTIGATIVE FILE

Date	Subject
8-03-71	Letter to GM requesting information.
8-19-71	Letter from GM. Reply to letter of 8-03-71 with six enclosures.
10-29-71	Letter to GM requesting update on test information.
11-16-71	Memo to File, GM reply to NHTSA letter dated 10-27-71.
11-71	TTI report on Corvair tests (See Section III).
11-30-71	Memo requesting extension of TTI contract.
1-25-71	Panel evaluation of Corvair Handling (See Section III).
2-9-72	Congressional Record extensions of Corvair remarks.
3-24-72	Letter to GM requesting additional information.
4-05-72	Letter from GM. Submittal of information. Four attachments (See Section III).
4-17-72	Memo to File. GM reply to NHTSA letter dated 3-24-72.
4-26-72	Letter to Sen. Magnuson from Ford (See Section III).
5-01-72	Telecon with Carl Nash, PIRG, re Corvair accident.
5-12-72	Nader Press Conference.
6-06-72	Addendum to panel report (attached to Jan. 25 report, see Section III.)
7-03-72	Letter to GM requesting reclassification of information.
7-03-72	Letter to Ford requesting reclassification of information.
7-11-72	Letter to NHTSA from GM reclassifying information (NHTSA letter of 7-3-72)
7-18-72	Memo from R. L. Carter authorizing disclosure of classified Ford material. (ref. NHTSA letter of 7-3-72)
7-21-72	DOT News Release, Handling and Stability.
7-24-72	Evaluation of the 1960-1963 Corvair Handling and Stability.

OFFICE OF DEFECTS INVESTIGATION

SECTION II
CONSUMER LETTER
INDEX

CASE NUMBER IR-279

Sequence No.	ODI No.	Ltr. Date	Name	City/State
IR-279-1.1	01275	4-11-67	VAISEY, John	Los Angeles, CA
-1.2	02384	11-6-67	SROLZYNSKI, Stanley	Lansing, IL
-1.3	04032	1-24-69	RITTENHOUSE, Anna	Towerhill, IL
-1.4	06431	9-4-70	POE, Stanley (Mrs.)	Auburnsdale, MA
-1.5	06480	9-4-70	WADE, Jack	Los Angeles, CA
-1.6	06464	9-5-70	SCAFFETA, Jerry	Hauppauge, LI, NY
-1.7	06627	9-5-70	SHORE, Louis	Tallahassee, FL
-1.8	26832	9-5-70	GARVIN, William (Mrs.)	Cape Coral, FL
-1.9	06989	9-5-70	WESTERLUND, John	Pontiac, MI
-1.10	06467	9-5-70	KURTZ, George	Huntsbille, AB
-1.11	06466	9-5-70	BARKUME, Ray (Mrs.)	Grosse Ile, MI
-1.12	06712	9-5-70	DALE, Joyce	Hollywood, CA
-1.13	26833	9-6-70	ARDERY, Winston B.	Frankfort, KY
-1.14	06465	9-6-70	MATZ, Howard (Mrs.)	Warren, OH
-1.15	06429	9-6-70	LAWRENCE, Lloyd	Castro Valley, CA
-1.16	26834	9-7-70	LUTZ, Lucille (Mrs.)	Fresno, CA
-1.17	26835	9-7-70	DOERSAM, Virginia (Mrs.)	Columbus, OH
-1.18	26836	9-7-70	ARNOLD, Herbert	Davis, CA
-1.19	26837	9-7-70	EHRETZ, John	Los Angeles, CA
-1.20	06427	9-7-70	CROSS, Nancy (Miss)	Brandywine, MD
-1.21	26838	9-8-70	BUMGARNER, William	Norman, OK
-1.22	26794	9-8-70	TAYLOR, Gene W. (Mrs.)	Cincinnati, OH

OFFICE OF DEFECTS INVESTIGATIO

SECTION II
CONSUMER LETTER
INDEX

CASE NUMBER IR-279

Sequence No.	ODI No.	Ltr. Date	Name	City/State
IR-279-1.23	26795	9-8-70	JONES, Peder E.	Menlo Park, CA
-1.24	26796	9-9-70	IACONO, Mary I. (Miss)	Newton, MA
-1.25	26797	9-9-70	FURBEE, Austin C.	St. Clairsville, OH
-1.26	06562	9-9-70	GLEASON, William F.	Slingerlands, NY
-1.27	26798	9-9-70	WEST, Chuck	Mountain Lakes, NJ
-1.28	06534	9-9-70	ANDERSON, Sophie (Mrs.)	Corning, NY
-1.29	26799	9-10-70	BURGE, Robert	Frankfort, MI
-1.30	26800	9-10-70	ROMAN, Alfred I.	Hollywood, CA
-1.31	26801	9-10-70	PIEPIORA, Terry E. (Mrs.)	W. Wareham, MA
-1.32	26802	9-10-70	HOOVER, John E.	Rushville, IN
-1.33	26803	9-10-70	DANIEL, Emmett C.	Columbus, OH
-1.34	26804	9-10-70	SILBER, Laura T. (Mrs.)	Camden, NJ
-1.35	26805	9-10-70	JOFFEE, Joseph P.	Elizabeth, NJ
-1.36	06577	9-10-70	HALLAM, B. A.	Morris Plains, NJ
-1.37	26806	9-10-70	KIMBALL, Donald E. (Mrs.)	DCA Europe, APO NY
-1.38	26807	9-11-70	STRONGE, W. J.	China Lake, CA
-1.39	26808	9-11-70	LEE, Dorothy (Miss)	Cambridge, MA
-1.40	26809	9-12-70	EVANS, John F.	Crystal City, MO
-1.41	26810	9-12-70	TONNINGSEN, Charles F.	Seattle, WA
-1.42	26811	9-12-70	BUCKNER, Chester L.	Hamilton, OH
-1.43	26812	9-13-70	HURLEY, Paul	Minneapolis, MN
-1.44	26813	9-14-70	LEONARD, Frank	New York, NY

OFFICE OF DEFECTS INVESTIGATIO

SECTION II
CONSUMER LETTER
INDEX

CASE NUMBER IR-279

Sequence No.	ODI No.	Ltr. Date	Name	City/State
IR-279-1.45	26814	9-14-70	SANDERS, Thomas E.	Norwich, CT
-1.46	26815	9-14-70	COOK, Merlin H.	W. Franklin, NH
-1.47	26816	9-14-70	HENRICKSEN, Edward	St. Petersburg, FL
-1.48	26817	9-15-70	GASMANN, C. H. (Mrs.)	Eagle River, WI
-1.49	26818	9-15-70	THOMPSON, Homer R.	Pittsburgh, PA
-1.50	26819	9-15-70	WILKEY, Frank, Jr.	Rochester, MN
-1.51	26820	9-16-70	DENNISON, George H.	Tonawanda, NU
-1.52	26821	9-16-70	BRODMAN, Diana	Cicero, IL
-1.53	06617	9-16-70	COLE, David E.	Ann Arbor, MI
-1.54	06488	9-16-70	CONWAY, R. F.	Austin, MN
-1.55	26822	9-18-70	ESTROW, Stanley M.	New York, NY
-1.56	26823	9-18-70	PATRICK, John	Detroit, MI
-1.57	26824	9-20-70	MORRIS, Pauline J.	Charlotte, NC
-1.58	26825	9-21-70	WHEELER, L. H.	Salem, WI
-1.59	06569	9-22-70	SORENSON, Emma L. (Mrs.)	Wilmington, DE
-1.60	06437	9-22-70	BLACKMAN, Walter	Los Angeles, CA
-1.61	26826	9-23-70	GILLIAM, Frank	Kingsport, TN
-1.62	26827	9-23-70	LAWRENCE, Lloyd	Castro Valley, CA
-1.63	06519	9-25-70	McDOWALL, John	St. Petersburg, FL
-1.64	26828	9-28-70	WASHINGTON, Gregory	New York, NY
-1.65	26829	10-9-70	EHRETZ, N, Kenneth	Los Angeles, CA
-1.66	26830	10-10-70	JENKINS, William (Mrs.)	New Carlisle, I

OFFICE OF DEFECTS INVESTIGATION

SECTION II
CONSUMER LETTER
INDEX

CASE NUMBER IR-279

Sequence No.	ODI No.	Ltr. Date	Name	City/State
-1.67	07302	10-26-70	BISSELL,	Louis, MO
-1.68	07095	11-17-70	MICHEAU, J	Ellyn, IL
-1.69	07135		SCHALL, W	ego, CA
-1.70	26831		OWRUTSKY,	bury, MD
-1.71	07375	12-	DIETZEN,	ooga, TN
-1.72	07453	12-23	HUDSON, H	sville, OK
-1.73	07741	1-	CONRAD, T	cago, IL
-1.74	07744	2	JOHNSON,	ley, IL
-1.75	08236	4	BUSBY, Da	ton, D.C.
-1.76	09170		MARGOLIS,	, NY
-1.77	09632		SMATHERS,	mi, FL
-1.78	23679	2		mix, AZ

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A1		Davidson Lab Report of Tire Pressure	Exhibit A
-A2	Letter dated 5-17-71	Proposed Vehicle Testing Procedure-GMC - May, 1971	Exhibit A
-A3		Texas Transportation Instutite Report on Small Passenger Cars - November, 1971	Exhibit A
-A4		Panel Evaluation of Corvair Handling and Stability - January 25, 1972	Exhibit A
-A4.1		Addendum to Panel Evaluation - June 6, 1972	Exhibit A (with -A4)
NOTE: Because of the bulk of the following material, it has not been reproduced in the public file, but is available for review upon specific request.			
Documents and Films Supplied by General Motors Corporation			
IR-279-A5		ITEM I-A-1	
-A5.1		Proving Ground Report 15699	
-A5.1.1		Film for P.G. 15699	
-A5.2		P.G. 17103	
-A5.2.1		Film for P.G. 17103 (Reel #1)	
-A5.2.2		(Reel #2)	
-A5.2.3		(Reel #3)	
-A5.2.4		(Reel #4)	
-A5.3		Test Work Order 25564-66	
-A5.4		T.W.O. 29023-14	
-A5.5		Model Car on Ramp Film	
-A6		ITEM I-A-3	
-A6.1		P.G.Report 11245, Tire Blowout Comparison at 60 mph., 1959 Chevrolet and 1960 Corvair	
-A6.2		"Handling Characteristics of Automobiles" by Dr. T. Manos, Iowa Public Hearing on Automotive Safety	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A6.3		Deposition of Dr. T. Manos in Anderson vs. General Motors	
-A6.4		List of Alleged Corvair Defects as given by D. Harney, Plaintiffs' Attorney	
-A6.5		Opening Statement on Behalf of the Plaintiffs by D. Harney in Collins vs. General Motors	
-A6.6		M.I.R.A. Report - V.A. II	
-A6.7		Closing Arguments, Collins vs. GMC (Item I-A-3(l)	
-A6.8		Closing Arguments, Drummond vs. GMC (Item I-A-3(m)	
-A6.9		ITEM I-A-3(j), Vehicle and Driver Performance Film	
-A7		ITEM II-B, Chevrolet Test Reports	
-A7.1		T.W.O. 25004-13	
-A7.2		T.W.O. 25013-59	
-A7.3		T.W.O. 25014-46	
-A7.4		T.W.O. 25014-47	
-A7.5		T.W.O. 25014-51	
-A7.6		T.W.O. 25508-4	
-A7.7		T.W.O. 25513-14	
-A7.8		T.W.O. 25564-37	
-A7.9		T.W.O. 25585 (Ref. P.G. 13685)	
-A7.10		T.W.O. 25592	
-A7.11		T.W.O. 25508-4	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A7.12		T.W.O. 25014-11	
-A7.13		T.W.O. 25014-50	
-A8		ITEM II-C, Proving Ground Reports	
-A8.1		P.G. 14737	
-A8.2		P.G. 14752	
-A8.3		P.G. 17118 (Ref. T.W.O. 29111-10)	
-A8.4		P.G. 17854	
-A8.5		P.G. 19577	
-A8.6		P.G. 11106	
-A9		ITEM III-A-1, Drummond Decision	
-A10		ITEM III-A-3, Complete Winchell Transcript	
-A11		ITEM III-A-4	
-A11.1		Summary - Corvair D ons and Characteristics	
-A11.2		Corvair Ownership Li	
-A11.3		S.A.E. Paper #140C	
-A11.4		S.A.E. Paper #143D	
-A11.5		Comments on ACIR, CAL). VJ-1823-R32	
-A11.6		Movie - Pomona Rollo . ctempts	
-A12		ITEM III-A-5, Lansing Presentation and Background Information	
-A12.1		Letter and copy of Statement by G.M.C. before Michigan State Highway Committee, February 21, 1966	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A12.2		Transcript of F. J. Winchell's Statement	
-A12.3		F. J. Winchell's Exhibits	
-A12.4		Michigan Senate Bill #766-773 and back-up material	
-A12.5		Statements of the Other Witnesses Before the Michigan Senate Highway Committee, February 22, 1966	
-A12.6		Rim to Ground Clearance Photographs (Item III-A-5(f)	
-A12.7		Movie #7, Normal and Hard Driving	
-A12.8		Movie #8, Simulated Roadability	
-A12.9		Movie #2, J-Turns	
-A12.10		Slides in F. J. Winchell Presentation-Lansing, Michigan. February 21, 1966	
-A12.10.1		Slide #1	
-A12.10.2		Slide #3	
-A12.10.3		Slide #4	
-A12.10.4		Slide #5	
-A12.10.5		Slide #6	
-A12.10.6		Slide #10	
-A12.10.7		Slide #11	
-A12.10.8		Slide #12	
-A12.10.9		Slide #13	
-A12.10.10		Slide #14	
-A13		ITEM III-A-6, Excerpts of Testimony	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A14		Film A-50, Free Control	
-A15		Film A-53, Normal and Hard Driving	
-A16		Film A-64, Simulated Roadability	
-A17		Film A-83, Fixed Steering--Corvair-In-car	
-A18		Film A-84, Fixed Steering--Corvair-Outside	
-A19		Film A-85, Fixed Steering--Falcon-In-car	
-A20		Film A-86, Fixed Steering--Falcon-Outside	
-A21		Film A-88, Skidpad Limit of Control--Corvair-In-car	
-A22		Film A-89, Skidpad Limit of Control--Corvair-Outside	
-A23		Film A-90, Skidpad Limit of Control--Falcon-In-Car	
-A24		Film A-91, Skidpad Limit of Control--Falcon-Outside	
-A25		Film A-93, Film Showing the Effect of Ride Motions during Cornering--Corvair-In-car	
-A26		Film A-94, Film Showing the Effect of Ride Motions during Cornering--Corvair-Outside	
-A27		Film A-95, Film Showing the Effect of Ride Motions during Cornering--Falcon-In-car	
-A28		Film A-96, Film Showing the Effect of Ride Motions during Cornering--Falcon-Outside	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A29		Film A-98, Film Showing J-turns with and without braking--Corvair-In-car	
-A30		Film A-99, Film Showing J-turns with and without braking--Corvair-Outside	
-A31		Film B-1, Film Showing J-turns with and without braking--Falcon-In-car	
-A32		Film B-2, Film Showing J-turns with and without braking--Falcon-Outside	
-A33		Film B-8, Ride and Handling Road Film--Corvair-In-car	
-A34		Film B-9, Ride and Handling Road Film--Falcon-In-car	
-A35		Film B-10, Ride and Handling Road Film--Belair Chevy II-In-car	
-A36		Film B-12, Vehicle Evasive Performance-In-car	
-A37		Film B-13, Vehicle Evasive Performance-Outside view	
-A38		Film B-29, Ramp Film--Corvair-Outside	
-A39		Film B-30, Critical Speed Film--Corvair-In-car	
-A40		Exhibit "N" - Film of Driving at the Drummond Accident Site (Suspension Camera)	
-A41		Exhibit "M" - Film of Driving at the Drummond Accident Site (Inside Camera)	
-A42		Exhibit #48 - O'Shea Pomona Film	
-A43		Film for P. G. 11106	
-A44		Film for P.G. 11304	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A45		Film for P.G. 11285 (2 reels)	
-A46		Dynamic Roadability-Corvair--Views of Both Rear Wheels During Skid Pad Runs	
-A47		Exhibit #74--Part 1 and 2--Rollover Test of the Shock Absorber Lower Mounting Bracket (2 reels)	
-A48		Exhibit #75--O'Shea--Manos Film	
Documents and Films Supplied by Ford Motor Company			
-A49		Film--"1960 Falcon-Corvair Handling Comparison" and analysis by Harley Copp	
-A50		Intra Company Communicat Sub' t: Vehicle Response Charact ic Test Vehicle GAP #1 date e 8, 1968	
Raw Data for NHTSA Tests at Texas Transportation Institute			
-A51		Book of Vehicle Prepara Maintenance Records	
-A52		Volume I, Test Run Data	
-A52.1		Volume II, Test Run Data	
-A53		Test Run Strip Charts ( )	
		Carton I	
-A53.1		8.1 4.24 A	
-A53.2		8.1 513 B	
-A53.3		8.1 526 C	
-A53.4		8.1 6.4 E	
-A53.5		8.1 605 H	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A53.6		8.1 605 H	
-A53.7		8.1 605 H	
-A53.8		8.1 623 J	
-A53.9		C7.2 422 A	
-A53.10		B7.2 422 A	
-A53.11		A7.2 422 A	
-A53.12		A8.2 421 A	
-A53.13		B8.2 421 A	
-A53.14		C8.2 421 A	
-A53.15		A, B, C7.2 507 B	
-A53.16		A, B, C8.2 507 B	
-A53.17		A, B, C7.2 521 C	
-A53.18		A, B, C8.2 521 C	
-A53.19		7.2 611 E	
-A53.20		8.2 610 E	
-A53.21		7.2 602 H	
-A53.22		8.2 602 H	
-A53.23		A, B, C7.2 619 J	
-A53.24		8.2 618 J	
		Carton II	
-A53.25		8.3 4-25 A	
-A53.26		8.3 508 B	
-A53.27		8.3 508 B	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A53.28		8.3 526 C	
-A53.29		8.3 613 E	
-A53.30		8.3 613 E	
-A53.31		8.3 603 E	
-A53.32		8.3 621 J	
-A53.33		8.4 427 A	
-A53.34		8.4 510 B	
-A53.35		8.4 615 E	
-A53.36		8.4 604 H	
-A53.37		8.4 622 J	
-A53.38		B8.4 428 A	
-A53.39		B8.4 513 B	
-A53.40		B8.4 527 C	
-A53.41		B8.4 615-616 E	
-A53.42		B8.4 604 H	
-A53.43		B8.4 622-623 J	
-A53.44		8.5 519 A	
-A53.45		8.5 531 B	
-A53.46		8.5 530 B	
-A53.47		8.5 607 C	
-A53.48		8.5 606 C	
-A53.49		8.5 707 E	
-A53.50		8.5 624-625 H	
-A53.51		8.5 714 J	
-A53.52		8.4 527 C	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
		Documentary Films	
IR-279-A54		Reel #1, Documentary shots of Vehicle A (Falcon with driver-instrumentation package; A 8.2 (A, B, C), 7.2 A	
-A55		Reel #2, A 7.2 (B,C), 8.1	
-A56		Reel #3, A 8.1, 7.1	
-A57		Reel #4, A 7.1, 8.3	
-A58		Reel #5, A 8.3	
-A59		Reel #6(A & B), A 8.4	
-A60		Reel #7, A 8.4	
-A61		Reel #8(A), A B8.4	
-A62		Reel #8(B), B 8.2 (A, B, C)	
-A63		Reel #9, B 8.3, 8.4, B8.4	
-A64		Reel #10, B 7.2 (A, B, C), B 8.3	
-A65		Reel #11, B B8.4, B 8.1	
-A66		Reel #12, Documentary of Vehicle A with controller package; B 8.1; Documentary of Vehicle C with driver-instrumentation package; A 8.5	
-A67		Reel #13, C 8.2 (A, B, C), c 7.2 (A, B, C)	
-A68		Reel #14, C 8.1	
-A69		Reel #15, C 8.1, 8.3	
-A70		Reel #16, C 8.3, C 8.4, C B8.4	
-A71		Reel #17, Documentary shots of Volkswagen with controller package; C B8.4	

85-820 O - 73 - 28

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A72		Reel #18, Documentary shots of Volkswagen with controller package; B 8.5	
-A73		Reel #19, B 8.5; documentary shots of Valiant with driver-instrumentation package; H 8.2 (A, B, C), H 7.2 (A, B, C)	
-A74		Reel #20, H 7.2(C), H 8.3, H 8.4	
-A75		Reel #21, H 8.4, H B8.4	
-A76		Reel #22, H 8.1	
-A77		Reel #23, Documentary of 1963 Corvair controller package and test procedures; C 8.5	
-A78		Reel #24, E 8.2 (A, B, C), 7.2(A)	
-A79		Reel #25, E 7.2 (B, C) E 8.3	
-A80		Reel #26, E 8.3, E 8.1, E 8.4	
-A81		Reel #27, E 8.4	
-A82		Reel #28, E 8.4, B8.4	
-A83		Reel #29, Documentary of 1967 Corvair with driver-instrumentation package; J 8.2(A)	
-A84		Reel #30, J 8.2 (B, C), 7.2(A, B, C), 8.3	
-A85		Reel #31, J 8.3, 8.4	
-A86		Reel #32, J 8.4, B8.4, 8.1	
-A87		Reel #33, J 8.1, H 8.5	
-A88		Reel #34, Documentary of Renault with controller package; H 8.5; documentary of 1967 Corvair with controller package; E 8.5	

OFFICE OF DEFECTS INVESTIGATION

SECTION III
DOCUMENTARY EVIDENTIAL
MATERIAL INDEX

Sequence No.	Input Reference	Type of Input	Location
IR-279-A89		Reel #35, Documentary of 1967 Corvair with Controller package; J 8.5	
-A90	GM letter dated 4-5-72	Instrumentation for Characteristic Speed Measurements.	Exhibit A
-A90.1		The Influence of Vehicle Design Parameters on Characteristic Speed and Understeer.	Exhibit A
-A90.2		Letter dated 2-3-72 to the Members of the SAE vehicles dynamics committee.	Exhibit A
-A90.3		Readers Letters from R. Thomas Bundorf, Staff Project Engineer, General Motors Technical Center.	Exhibit A

OFFICE OF DEFECTS INVESTIGATION

PHYSICAL EVIDENTIAL
MATERIAL INDEX

Sequence No.	Item Reference	Item	Location
IR-279-B1	Memo dated 6-16-72	Test and backup vehicles used in NHTSA conducted tests at TTI	See Section I

File June 16, 1972

Safety Standards Engineer
Investigations Division

IR-279 - Physical Evidential Material

The only physical evidential material from this investigation are the test and backup vehicles employed in the NHTSA conducted input response tests at Texas Transportation Institute, Texas A & M. These vehicles are now in storage at that facility in College Station, Texas.

Test Vehicles

1962 Falcon	VIN 2R1741108646
1962 Volkswagen	VIN 4017237
1963 Corvair	VIN 3076901034&8
1963 Renault	VIN 130041 6833791
1960 Valiant	VIN 1307110490
1967 Corvair	VIN 105377W126273

Backup Vehicles

1967 Volkswagen	VIN 5663135
1961 Valiant	VIN 1317159903
1962 Renault	VIN 1997041
1963 Volkswagen	VIN 5522159
1963 Falcon	VIN 3T01V127004
1968 Corvair	VIN 10537W100248
1963 Corvair	VIN 30927W313167

Ernest P. Wittich

Question. Please include a listing and descriptive statement of each piece of "proprietary" material which will not be available for public review.

Answer. The NHTSA has accepted as proprietary from General Motors an index of several thousand work orders, proving ground test reports, and films. From this index NHTSA selected to review and analyze in depth some 162 proving ground tests and films. Sixty seven (67) of these test reports and films appear in the public files. Ninety five (95) have been accepted as proprietary. In addition to the foregoing the NHTSA has accepted from GM as proprietary a Corvair litigation summary, and other test reports and analyses. Much of this latter material has been transmitted to us in bulk and has not been indexed. Finally, we have covering letters from GM rquesting confidential status for all of the material above mentioned.

In addition to the foregoing, the NHTSA has accepted as proprietary from the Ford Motor Company some 59 similar tests, reports, films, and analyses.

The proprietary information detailed above has not been publicly indexed nor placed in the public file, as is customary in all of our investigations. It is believed that any public disclosure other than made above of a description of the designated documents would violate the integrity of the confidentiality of our agreement and investigative efforts.

Question. Please provide for the record a copy and NHTSA analysis of GM reports numbers PG–15–699, PG–17–103.

Answer. Attached is a copy and NHTSA analysis of General Motors' reports PG15699 and PG17103.

NHTSA Analysis of General Motors Proving Ground Reports PG 15699 and PG 17103

In Mr. Nader's letter of December 15, 1970, to Mr. Volpe (Appendix II), he cited two General Motors Proving Grounds reports—PG 15699 and PG 17103—which he asked the Department of Transportation to include in the investigation of the stability of the 1960–1963 Corvair. These two reports including the many supporting charts, photographs, and movie film had been received from General Motors three months previously.

The General Motors tests, as explained in these reports, were conducted for the purpose of evaluating the roll stability characteristics of different suspension modifications on a 1962 and 1963 Corvair.

Ten different sets of test conditions with various modifications were evaluated in PG 15699 and eight test conditions with various modifications in PG 17103.

To conduct the tests and protect the driver the windshield and rear glass were removed, a set of roll bars installed, rear seat removed, and the vehicle interior padded.

The vehicles were equipped with accelerometers and potentiometers to measure the accelerations and motions resulting from the tests. A camera was mounted on the vehicles to record suspension motions.

The vehicles were driven by a professional test driver at increasing speed increments using rapid steering, maximum throttle and torque inputs designed to test the various suspension modifications to the point of rollover or until it was difficult to produce a more violent maneuver.

The vehicle used in run number 120 of PG 17103 was a 1962 Corvair with 1963 production shock absorbers. It had been used for 64 runs in PG 15699 and PG 17103 and had been rolled over 10 times before run number 120. The tenth rollover (run number 117) was a severe one. The vehicle had a set of roll bars installed, the windshield and back glass had all been removed, the rear and front wheel openings were cut out, the rear seat removed and the body had been deformed in the previous tests. The center of gravity had been shifted upward and rearward as a result of these modifications to the vehicle. The conditions described above show that the vehicle was in a test development configuration that was not representative of a 1962 or 1963 production Corvair.

The hydraulic rebound limiting cutoff shock absorber used on run number 73 of PG 15699 was even longer than the 1963 production shock absorber. Also, run number 71 of PG 15699 which resulted in a rollover had exactly the same configuration as run number 73, except the rebound travel in run number 71 was limited by an additional one-half inch. There were many rollovers in PG 17103 in which rebound was restricted even more than in run number 73.

The configuration in PG 15699 that was similar to the RPO 696 package did not prevent a rollover. Also the rebound straps used in the RPO package did not

restrict the rebound camber angle any further than the 1963 or 1964 production hydraulic rebound cutoff shock absorbers.

The rebound could not be restricted further than that of the 1963 production vehicles because there would not be sufficient wheelhouse clearance to remove the wheel and tire assembly.

The information contained in the PG reports and films do not represent conditions that would be experienced in the practical driving environment. The maneuvers that the test driver used were maximum throttle-extreme steering inputs designed to produce rollover. It was observed that many attempts involving extreme maneuvers designed to cause rollover were made by expert drivers before rollover actually occurred.

Frame-by-frame analysis of the films clearly established that wheel rim contact with the pavement is not the precipitating cause of Corvair rollover, but occurs in the course of rollover. Similarly, it has been established that while a moderate amount of positive camber and jacking at the rear wheels exists prior to rollover of the Corvair, tuckunder is not observed until the vehicle is well into a rollover mode. Tuckunder, therefore, is considered not to be a major contributor to Corvair rollovers.

In summary, because these development tests were so severe in nature and the vehicles used were in various states of modification these tests were not representative of the practical driving environment.

Question. If the VW and Renault were not a part of the sample, would your conclusion have been the same regarding the existence of a defect in the Corvair?

Answer. Yes, it is concluded the handling and stability performance of the 1960–1963 Corvair does not result in an abnormal potential for loss of control or rollover and that its handling and stability performance is at least as good as the performance of some contemporary vehicles both foreign and *domestic* (emphasis added.)

The domestic vehicles were the Valiant and the Falcon.

Our conclusion therefore remains the same if the VW and Renault, the foreign vehicles, had not been included in the tests.

Question. Is it true that the Corvair's performance in terms of stability is not comparable to that of the Valiant and the Falcon, two other cars in its class?

Answer. No. It is concluded that the handling and stability performance of the 1960–1963 Corvair does not result in an abnormal potential for loss of control or rollover and that its handling and stability performance is at least as good as the performance of some contemporary vehicles both foreign and *domestic.* (Emphasis added)

The domestic vehicles were the Valiant and the Falcon.

Question. Since the VW and Renault were found to be more unstable than the Corvair, does the NHTSA intend to pursue an investigation into these vehicles for defective handling and stability characteristics? If not, why not?

Answer. The tests conducted by NHTSA in Texas were comparative in nature. All the cars in the tests performed differently. The NHTSA input-response tests did not indicate that the degree of variance between the handling and stability characteristics of the Volkswagen and Renault with that of the other vehicles tested was sufficient to warrant the initiation of separate investigations of the two named vehicles at this time. However, this does not preclude us from considering additional evidence or further evaluation of our test data if it becomes available with respect to these two vehicles.

Question. Mr. Toms, if there are several critiques of the NHTSA study by reputable and knowledgeable authorities in the field of automotive engineering, would you compile and publish these critiques as a supplement to the NHTSA report?

Answer. Any critique of the NHTSA report by reputable and knowledgeable authorities in the field of automotive engineering will be considered and evaluated. If our evaluation of such critiques indicates a "safety" need for their inclusion in our public file they would be so included.

Question. How does the NHTSA define a "safety defect?"

Answer. Section 113(e) of the Traffic Safety Act requires the manufacturer to issue defect notifications to vehicle owners if directed to do so by the Administrator after the determination is made that the vehicle or one of its components constitutes a defect which replaces to motor vehicle safety. The "defect which relates to motor vehicle safety" is not defined in Section 113 of the Act. Section 102(11), however, defines "defect" to include "any defect in performance, con-

struction, components or materials in motor vehicles and motor vehicle equipment," and Section 102(1) thereof defines "motor vehicle safety" to mean:

> The performance of motor vehicles or motor vehicle equipment in such manner that the public is protected against unreasonable risk of accident occurring as a result of the design, construction or performance of motor vehicles and is also protected against unreasonable risk of death or injury to persons in the event accidents do occur, and includes nonoperational safety of such vehicles.

Our working definition of a safety related defect would be any defect in design, construction, materials, components, or performance in motor vehicles and motor vehicle equipment which would result in an unreasonable risk of accidents occurring or in an unreasonable risk of death or injury to persons in the event accidents do occur, whether the vehicle is in operation or not.

Question. The panel's summary states that "the Corvair can change from understeer to oversteer in a very short period of time when the car is involved in a steer to oversteer in a very short period of time when the car is involved in a turning situation under emergency conditions." (p. 4) If a car doesn't do what the average driver would anticipate it to do in an emergency situation, why doesn't that consitute a defect?

Answer. The Panel's summary does state that "the Corvair can change from understeer to oversteer in a very short period of time when the car is involved in a turning situation under emergency conditions," such as, when the vehicle is not operated normally and prudently and is exceeding posted State speed limits and expressway exit ramp speed limits. The NHTSA engineers believe that many vehicles other than the Corvair may experience unusual handling characteristics in such an emergency situation. The typical conventional passenger car is basically an understeering vehicle. However, under various loads, speeds and tire pressure conditions some vehicles, both foreign and domestic, also transition from understeer to oversteer. In extreme emergency situations the typical driver makes a brake application resulting in wheel lockup. In this situation both understeer and oversteer vehicles are uncontrollable. The NHTSA engineers also noted that in extreme emergency situations where wheel lockup does not occur, only a moderate amount of steering movement in the 1960–1963 Corvair is required. Drivers will normally correct the steering wheel angle to follow the desired driving direction without having any awareness of having made the correction. The NHTSA engineers are of the opinion that the transition from understeer to oversteer in the Corvair does not result in unusual risk of loss of vehicle control.

Tire Quality Grading

Question. A newspaper article (July 18 in the Akron Beacon Journal) claims that the uniform tire quality grading system won't be in effect until August, 1973, five years after it was scheduled to be implemented under the law; and that tires will be graded only for treadwear, traction and high speed performance, not for other performance areas proposed in the department's original draft. Is this true? If so, please explain why other performance areas have been dropped from the proposed grading system—and when you actually expect to implement it.

Answer. The present schedule for a tire quality grading system calls for issuing an NPRM in September 1972, and the issue of a rule in March 1973, with a proposed effective date one year later. The tire characteristics to be included in this Phase II UTQGS are treadwear, traction, and high-speed performance.

Phase I UTQGS covered tire strength, endurance, high-speed and uniformity. You will recall that the Phase I NPRM was issued in September 1971, and a Technical Meeting was held November 12, 1971. Practically all the comments to the docket as well as those made at the Technical Meeting were strongly opposed to the Phase I UTQGS and it was subsequently abandoned.

The Phase I issue demonstrated the resolve of NHTSA on this subject. Starting in January 1972, the major tire companies made independent presentations to NHTSA which stressed the grading of the three areas considered most important to consumers—treadwear, traction, and high-speed. Since this new input agreed almost exactly with the information we had already obtained from other sources such as the docket, public opinion polls, etc., we dropped the grading of strength, endurance and uniformity. Further, performance requirements for strength and endurance are currently included in FMVSS 109. The questionable value to the consumer of grading uniformity vs. the enormous cost of implementation to the decision to eliminate this characteristic from the UTQGS.

STATEMENT OF DAVID MARKIN, PRESIDENT, CHECKER MOTORS CORP.

My name is David Markin, and I am President of Checker Motors Corporation, which is located in Kalamazoo, Michigan. I appreciate very much this opportunity to be heard by this Committee and to emphasize the urgent need for the re-enactment of the temporary exemption authority which expired on April 10, 1971 .

Checker Motors Corporation has for 50 years specialized in the production of taxi cabs. Our vehicles are designed for comfort, durability, and economy of operation and repair. The experience of large fleet operators shows that Checker vehicles have a safety record considerably better than the average passenger car, as a result of their design and their operation by professional drivers under city driving conditions.

Available records from 1960 through 1971, covering almost 2 billion miles of operation, show average fatalities per 100 million vehicle miles in our fleet operations of 1.8 in comparison with the nation-wide average during the same period of 5.3 fatalities for each 100 million vehicle miles. I have attached a chart to this statement detailing these records.

Checker's production is approximately 5 thousand vehicles per year. Because we rely upon other manufacturers for many of our component parts, our adaption and testing is of necessity delayed until the prime producer has determined its compliance with the standards and is prepared to make deliveries to the secondary market. This substantially limits our lead time and on occasion defers our final testing procedures until very close to the effective date of a safety standard.

In addition, being a limited production manufacturer, our technical staff and testing ability are limited and our model changes from year to year are minimal. Therefore, the need to continually modify production plans to incorporate new standards which become effective during production becomes a severe economic burden on the company. As motor vehicle safety standards become more sophisticated, our production and compliance problems assume increasing importance.

The ultimate ability of the small automobile manufacturer to meet the pending safety requirements and survive on an economic basis, is in serious question. Checker Motors Corporation believes that it can. However, to meet these standards on the same time schedule as the major manufacturer may not always be possible.

The Safety Act was amended in 1968 to provide temporary exemption authority applying to producers of less than 500 vehicles per year. This provision for temporary exemptions expired on April 10, 1971.

On October 15, 1970, the Safety Advisory Council established by Section 1493 of the Safety Act recommended that Congress be asked to extend the temporary exemption provision and to give the Secretary of Transportation broader powers. This recommendation of the Safety Advisory Council is incorporated in Section 9 of S. 3474. This proposal would re-enact the exemption authority added in 1968 in substantially the same form, expanding its availability to manufacturers whose total production does not exceed 10,000 vehicles annually.

When the first Checker was manufactured approximately 50 years ago, there were hundreds of automobile manufacturers in the United States. Checker has survived the competitive pressures that brought about the consolidation of most of the automobile production in the United States into the hands of four major companies. We have survived by serving effectively a small specialized segment of the automobile market. We have no doubt that we can continue to compete successfully. We have no doubt that we can continue to meet the safety standards. Our concern is that we may not be able to meet *all* future standards on the same schedule as the major manufacturers. Present law allows no distinction between Checker Motors and General Motors.

The Department of Transportation cannot be expected to defer a safety standard applying to over 10 million passenger vehicles sold yearly in the United States in order to provide a realistic time frame for compliance for the manufacturer of a few thousand. Some reasonable discretion must be vested in the Department of Transportation if the small manufacturer is to survive the next few years. As the Safety Council has said, ". . . exemption authority, which should be sparingly used, will result in earlier implementation of better standards. . . ."

FATALITIES PER 100,000,000 VEHICLE-MILES TRAVELED

Year	Taxicab fleets [1]		Nationwide [2]
	With holdup deaths	Without holdup deaths	
1960	1.9	1.3	5.3
1961	1.9	1.9	5.2
1962	1.8	1.2	5.3
1963	2.3	2.3	5.4
1964	1.7	1.1	5.6
1965	2.3	1.8	5.5
1966	.6	.6	5.7
1967	3.8	1.9	5.5
1968	4.0	3.3	5.4
1969	.7	.7	5.3
1970	5.2	4.6	5.0
1971	2.5	1.3	4.7
Average	2.4	1.8	5.3

[1] Taxicab fleets involved: (1) Checker Taxi Co., Inc., Chicago, Ill.; (2) Yellow Cab Co., Chicago, Ill.; (3) The Yellow Cab Co. of Pittsburgh, Pa.; (4) Yellow Taxi Co. of Minneapolis, Minn.
[2] From National Safety Council statistics.

ANALYSIS OF TAXICAB FATALITIES (1960 THROUGH 1971)

Year	Total taxicab milleage	Drivers killed in accidents	Drivers killed in holdups	Taxicab passengers killed in accidents	Pedestrians killed in taxicab accidents	Drivers and occupants of other vehicles
1960	159,907,303	1	1	1	0	0
1961	157,471,777	0	0	2	1	0
1962	164,312,558	0	1	0	1	1
1963	177,077,829	0	0	1	3	0
1964	180,438,140	2	1	0	0	0
1965	170,978,451	0	1	1	1	1
1966	163,920,611	0	0	0	1	0
1967	157,524,206	1	3	0	1	1
1968	152,029,049	2	1	1	2	0
1969	151,715,345	0	0	0	0	1
1970	153,106,692	0	1	1	5	1
1971	158,203,451	0	2	1	0	1
Total	1,946,685,412	6	11	8	15	6

STATEMENT OF DAVID BUSBY, COUNSEL TO THE AUTOMOBILE IMPORTERS OF AMERICA

Mr. Chairman, my name is David Busby. I am counsel to the Automobile Importers of America and am accompanied by George Nield, an automotive engineer with our firm. Because we were advised only yesterday of the Committee's change of schedule, I am appearing in place of Mr. Ralph T. Millet, President of the Automobile Importers of America.

When I called Mr. Millet in San Francisco yesterday afternoon and informed him that these hearings would be held today instead of next Tuesday, he asked that I express his appreciation and that of the AIA for the Chairman's invitation to appear before this Committee. We have been asked to limit our 15 minute testimony to the proposal which would permit the Secretary of Transportation to waive temporary motor vehicle safety standards under certain exceptional circumstances. We request the Chairman's permission to insert for the record at a later date our comments with respect to the mandatory recall and repair bill introduced by Senator Nelson and the provision recently submitted by the Department of Transportation that would authorize the phasing-in of safety standards.

AIA represents the importers of the following vehicles: Alfa Romeo, Austin, BMW, Citroen, Colt, DAF, Datsun, FIAT, Honda, Jaguar, Lotus, Mazda, MG, Peugeot, Renault, Rolls-Royce, Rover, SAAB, Subaru, Toyota, Triumph, and Volvo. Most of these import companies are subsidiaries of foreign car manufacturers. AIA's purpose is to keep members and associate members informed as to developments in federal and state legislation and regulations. In other words, AIA

consists of most major automobile importers, Volkswagen being the most notable nonmember.

AIA also represents—in the sense that they depend upon AIA members for their product—several thousand dealers who sell and service their vehicles in this country.

I respectfully request the Chairman's permission to include at this point in the record the text of a proposed new Section 123 of the National Traffic and Motor Vehicle Safety Act of 1966. We understand this will be introduced by a member of this Committee, Senator Weicker of Connecticut. AIA strongly supports this proposal.

A 1968 amendment to the National Traffic and Motor Vehicle Safety Act of 1966 contained a "safety valve" provision permitting the Secretary to exempt, temporarily, from specific standards, on a case by case basis, vehicles manufactured by small manufacturers—that is, those manufacturing less than 500 vehicles each year. However, this authority lapsed in early 1971, and there continues to be a widely recognized need to permit the Secretary of Transportation the discretion to permit variations from the safety standards which he promulgates. Such variations would promote the public interest by encouraging the development, for example, or a cleaner car or an urban car or by permitting an earlier effective date of safety standads for the greater majority of automobiles.

On October 18, 1971, Congressman Brown introduced a bill, H.R. 11287, which would give the Secretary of Transportation authority to grant exemption from Federal safety standards for any manufacturer whose total annual production does not exceed 10.000 vehicles.

On March 24, 1972, the Secretary of Transportation submitted a bill to the Congress—introduced by Senator Magnuson as S. 3474—that would make several amendments to the Safety Act. One amendment would give the Secretary of Transportation authority similar to that provided by Congressman Brown's Bill and would permit exemptions for any manufacturer whose total annual production does not exceed 10,000 vehicles.

The Weicker amendment would authorize the Secretary of Transportation to grant temporary waivers from Federal safety standards whenever he determines that such a waiver would be consistent with the public interest and the objectives of the Safety Act and would carry out any one or more of five specified objectives.

The five specified objectives are:

avoidance of serious economic injury to a local or regional economy arising out of unforeseeable circumstances. An example would be the destruction of a component plant by fire or flood requiring temporary relief to prevent the closing of assembly operations of the manufacturer;

promotion and encouragement of the development of new motor vehicle safety features. This is also contained in the DOT proposal;

promotion and encouragement of the development of new motor vehicle emission control features;

promotion and encouragement of the development of new motor vehicle design or construction features that would reduce the initial, operational, maintenance, or repair cost of the motor vehicle and, in particular, one designed for urban use; and

avoidance of substantial economic hardship to the manufacturer that would otherwise be caused by compliance with a standard. Waivers granted on the basis of proven substantial economic hardship on the manufacturer would be limited to those makes of vehicles, the annual U.S. sales of which do not exceed 10,000. Also, proof of a generally good record of compliance would be required. In the case of makes with annual sales not exceeding 2.500, economic hardship is deemed to be satisfied if the make meets all safety standards relating to accident avoidance.

No waiver could be granted unless the Secretary makes a public finding that the waiver would be consistent with the public interest and the objectives of the Act. In addition, procedural provisions would ensure that interested persons would be given an opportunity to comment upon each application for a waiver. The Secretary would be required to make a decision on each application within 90 days and publish it in the Federal Register. Each dealer and first purchaser would be notified of the particular safety standard waived.

A temporary waiver would be in force for no more than 1 year, but two 1 year renewal periods would be permitted. This contrasts with the 3 year exemption period in the other two proposals. We feel that the 3 year period contained in the other proposals is more realistic, especially since the 3 year period is a maxi-

mum, and the Secretary would limit the waiver to the shortest appropriate period.

We feel that the cause of safety would be enhanced by this proposal.

It would permit companies to experiment with new safety features. An example of this would be the incorporation of a superior lighting system which might not conform to the rigid dimensional standards presently incorporated in Safety Standard 108. This would be particularly helpful to innovative companies like Citroen whose advanced safety lighting systems are unique and reportedly superior but not available in the United States.

It would permit the Secretary to introduce stronger standards earlier without causing economic ruin to companies whose model run does not happen to coincide with the effective date of a new standard. This is illustrated by the request of Lotus for a 6 months exemption to permit the development and introduction of a new model which would considerably exceed the safety requirements. With the Chairman's permission I would like to insert in the record at this point a recent letter from Dennis Austin, Managing Director of Lotus, to the Secretary of Transportation setting forth his reasons for requesting a 6 months exemption from the side door strength standard.

In conclusion, Mr. Chairman, I would suggest that Senator Weicker's proposal—unlike the other two—takes a positive approach. It permits the Secretary to balance various public interest benefits in granting waivers. It also provides adequate safeguards through public notice of the proceedings leading to any waiver and notification to the purchaser. Most important, it provides administrative flexibility to carry out more effectively the purposes of the Act. It permits the exception to prove the rule.

We respectfully recommend this Committee's favorable consideration of this proposal.

Thank you, Mr. Chairman.

PROPOSED NEW SECTION 123 OF THE NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT OF 1966

SEC. 123. (a) Upon application by a manufacturer at such time, in such manner, and containing such information as the Secretary shall prescribe by regulation, the Secretary shall grant a motor vehicle a temporary waiver from any motor vehicle safety standard established under this title if he determines that such temporary waiver would—

(1) be consistent with the public interest and the objectives of this Act, and

(2) carry out one or more of the following objectives:

(A) avoidance of serious economic injury to a local or regional economy arising out of unforceable circumstances;

(B) avoidance of substantial economic hardship to the manufacturer that would otherwise be caused by compliance with such standard;

(C) promotion and encouragement of the development of new motor vehicle safety features;

(D) promotion and encouragement of the development of new motor vehicle emission-control features; or

(E) promotion and encouragement of the development of new motor vehicle design or construction features that would reduce the initial, operational, maintenance, or repair cost of the motor vehicle and, in particular, one designed for urban use.

(b) Paragraph (2)(B) of subsection (a) may be one of the grounds of a temporary waiver only if the Secretary determines that—

(1) the motor vehicle in question is, in the judgment of the Secretary, one of a separate class of the manufacturer that is commercially recognized and that is distinctive in significant respect from other classes of motor vehicles;

(2) the total number of the motor vehicles of such class sold in the United States annually by the manufacturer, as determined by the Secretary, does not exceed 10,000; and

(3) the manufacturer has, in the judgment of the Secretary, a generally good record of compliance with the motor vehicle safety standards established under this title.

(c) Paragraph 2(B) of subsection (a) shall be deemed to be satisfied if the Secretary determines that—

(1) the total number of the motor vehicles of the class in question that require the temporary waiver and that are sold in the United States annually by the manufacturer does not exceed 2,500; and

(2) the class meets all the motor vehicle safety standards established under this title relating to accident avoidance.

(d) Following receipt of an application under subsection (a), the Secretary shall promptly publish in the Federal Register a notice summarizing the application and providing all interested persons with the opportunity to comment upon such application by such means as he deems appropriate, including public hearings.

(e) No later than 90 days after the date of its receipt, the Secretary shall make a decision with respect to an application under subsection (a) and shall publish his decision, together with a statement of the reasons therefor, in the Federal Register.

(f) The Secretary shall require, in such manner as he deems appropriate, that the manufacturer shall notify each unrelated dealer and first purchaser of a motor vehicle that has been granted a temporary waiver of the fact of such waiver and of the particular motor vehicle safety standards covered by such waiver.

(g) Any temporary waiver shall be in force for—

(1) an initial period of no more than one year from the date of its publication under subsection (e), and

(2) no more than two renewal periods of no more than one year each, any renewal to be subject to the making by the Secretary of the necessary determination under this section.

LOTUS CARS LTD.,
Norwich, England, July 6, 1972.

THE SECRETARY OF TRANSPORTATION,
Department of Transport,
Washington, D.C., U.S.A.

DEAR SIR: We appreciate that, at the present time, powers for the exemption of a manufacturer from the provisions of a specific vehicle safety standard do not exist but we are aware that there is a proposal, supported by the NHTSA and AIA, for these powers to be reinstated.

We trust that these powers of exemption will be regranted and would like to submit the following petition now in order that it may be considered at the earliest possible moment:

Manufacturer.—Lotus Cars Ltd., Norwich, England.

Total annual production, all models.—3000 approximately.

Total annual imports into the USA, all models.—1000 approximately.

Model.—Europa Twin Cam Special.

Motor Vehicle Safety Standard from which exemption is sought.—FMVSS 214 Side Door Strength.

Period of exemption sought.—From 1 January 1973 to 30 June 1973, inclusive.

Total projected US imports of model in question during this period.——750.

The specific reasons for the request for exemption for this one model only are:

a. It is not feasible to provide the necessary structure to meet the requirements on this model and failure to obtain exemption for the limited period of time requested would result in loss of sales in the USA which in turn would cause severe economic hardship to our USA dealers and importers, and also to our Company.

b. The exemption requested is for a limited period only to cover the introduction of a new model range which has been designed from new, to comply fully with FMVSS 214 and all other applicable federal motor vehicle safety standards.

c. In our new model programme we are obtaining occupant protection at performance levels significantly in excess of the required minimum, and we have good grounds for believing that our test results are better than those of some of the major volume manufacturers. The concepts which we have evolved may, incidentally, be of future benefit to the general public in providing improved vehicle crash worthiness.

We are prepared to make available to you whatever substantiating evidence you may require to demonstrate the improved aspects of our new model range performance insofaras they relate to vehicle safety standards.

Yours faithfully,

D. A. AUSTIN,
Director of Operations.

STATEMENT OF HON. JOHN W. WYDLER, U.S. REPRESENTATIVE FROM NEW YORK

Mr. Chairman, I am delighted to appear before your committee on behalf of the bill, S. 3433, introduced in the Senate by Jacob K. Javits on March 29th of this year. On that same day in the House of Representatives, I introduced a similar bill, H.R. 14220. This bill is an important piece of legislation that should be enacted by the Congress at an early date. This bill would authorize the Secretary of Transportation to establish requirements to promote safety of operation of school buses including such matters as qualification of drivers, maximum hours of service, and stardards of equipment. In addition, the Secretary is given enforcement powers and the power to issue cease and desist orders to stop school bus operations for up to 60 days where there is an unreasonable risk of accident, injury, death, or property damage.

My interest in such legislation, and other legislation along these lines that I have introduced previously, stems from the tragic accident of a school bus which occurred in Pennsylvania. The school bus carried children from the Hillel School in Lawrence, New York, which is located in my Congressional district. The injuries and deaths caused by the accident resulted in reports and public support calling for vigorous action. Little has been done to provide the level of supervisory inspectional services to assure a level of safety commensurate with the public's right to safe travel on chartered buses.

It appears to me that much more can and should be done and I am personally convinced that legislation similar to that which has been introduced by Senator Javits and myself will ultimately become law. The only real question is when. My major fear is that it will not happen until we have one or more new bus accident tragedies in which many children will lose their lives and others will be badly injured. I hope the committee will act now to avoid such a consequence. I believe my bill provides the committee with a good framework in which to operate; and if there are improvements that can be made in the bill, I will be delighted to have them incorporated. I urge you to take prompt and decisive action in this matter on behalf of the school children of our nation who deserve the protection we can give them.

AMERICAN SAFETY BELT COUNCIL, INC.,
New Rochelle, N.Y., July 11, 1972.

DEAR SENATOR: Along with many others, we are very concerned because the Department of Transportation's "passive restraint" regulation eliminates the present federal requirement that new cars be equipped with safety belts.

Recent tests of the inflatable passive restraint (airbags) conducted by the Department of Transportation in Phoenix and researchers at Wayne State University in Michigan have showed quite clearly that at this time such devices cannot be successfully demonstrated to be reliable, effective or efficient. Seat belts, on the other hand, have a proven track record.

Senator Marlow Cook has introduced an amendment (No. 1171) to S-3474, which will be considered at Commerce Committee hearings beginning July 19. It would require the Secretary of Transportation to require lap belts along with any passive device mandated under Motor Vehicle Safety Standard 208, until it can be shown conclusively that passive restraints are equal to or better than present systems.

We would appreciate it very much if you would convey your own thoughts to Chairman Magnuson regarding this aspect of DOT's occupant safety program, and to Secretary Volpe and Doug Toms, head of the National Highway Traffic Safety Administration.

Inflatable restraints show great promise, particularly for high speed, frontal crashes. But it seems foolhardy to impose an unproven device on motorists and to deny them the very substantive protection that seat belts provide.

Sincerely,

CHARLES H. PULLEY, *President.*

Enclosure.

STARTER-INTERLOCK SYSTEMS AS PASSIVE RESTRAINTS

(By Charles H. Pulley, president, American Safety Belt Council)

Air bags are 200,000 lives away. I repeat, 200,000 American lives away. With an average of 40,000 motor vehicle occupant deaths a year during the five years it will take for the majority of American cars to be equipped with air bags, 200,000

motorists will be killed. This, despite the widely held opinion of many people that these restraint devices which seem to have such great life-saving potential will be ready for their mission just any day now.

I know that some of you are probably thinking, "Now that's a self-serving statement if I ever heard one! Just what we might expect to hear from a seat belt manufacturer whose company and entire industry will be put out of business by the air bag."

So, before we move any further, let's clear the air on that point, for such is not the case. Nearly all of the safety belt companies in this country are heavily committed in the development of passive restraints, including the air bag. I know that in the case of my own company, Irvin Industries, we have had an active air bag development program for a number of years.

I speak to you today as the representative of an industry which has invested tens of millions of dollars in air bag research, development and testing, and in equipment and facilities.

Most of our members fully expect to be suppliers of air bag systems or components, and they probably will enjoy a larger business, dollarwise, than they are from their present safety belt business. So, you see, we have a substantial stake in the outcome of the air bag question.

Our deep commitment to research and development of air bags has given us a high regard for their life-saving potential, and at the same time instilled in us a healthy respect for the enormity and seriousness of the problems still to be solved before they become truly viable systems.

Under the present government timetable, passive restraints—probably air bags—are to be installed on all new cars as standard equipment beginning with 1976 models. But it will be at least five years after the first '76 models come rolling out of assembly plants—eight or nine years from now—before the majority of cars on the road have this protective device. That means another 200,000 or so American lives will be needlessly lost in the interim. Our industry is grievously concerned with this fateful prospect. We are sick at heart that this fatal disease may continue in its present epidemic proportions while we await a new cure several years hence. Most tragic of all is the fact that an effective cure is available right this very moment—the technology exists, and the systems need no extensive testing. I speak of the vastly underrated, much maligned automobile safety belt.

I suggest to you that safety belts—the highly recommended three-point harness system, configured with a sequential logic ignition interlock, are truly as effective when it comes to saving lives, and can be as widely utilized as any "passive" device known.

Up until now, too few people have taken vigorous exception to the semantic game-playing engaged in by the Department of Transportation that has resulted in the elimination of a completely workable, perhaps even superior system, and one vastly more competitive costwise, from consideration as a means of satisfying MVSS 208.

The objective ought to be to provide a system that will be employed when the car is moving so that its occupants will have optimum protection from death and injury in the event of accident. Terms like "passive" are meaningless in this context, and we risk playing loosely not only with words but also with consumers lives and pocketbooks.

In mandating highly sophisticated, extremely technical, intricately calibrated restraint systems costing perhaps $300,[1] and requiring in effect a totally new technology overnight, the Department of Transportation has effectively delayed implementation of known technologies with proven effectiveness and substantially lower price tags. Worse, because we still do not have on all new cars today these improved safety belt systems I speak of, people are being killed needlessly.

If the Department of Transportation is serious about its responsibility to the American public, it should put an end to word games, but if it must, then it ought to quickly find a word that fits any system that does the job when a car is in motion, and leave it up to the market place to dictate the final selection. It should make no difference whether belts or bags save lives, as long as they do the job.

---

[1] "Cumulative Regulatory Effects on the Cost of Automotive Transportation," U.S. Office of Science and Technology, February 1972.

Most of you here today are experts, or at least highly knowledgeable, in the field of automotive safety so it's not necessary for me to convince you of the effectiveness of the safety belt—when worn. The studies, the reports, the case histories are numerous. You're all familiar, I'm sure, with the Volvo findings,[2] the Cornell studies.[3, 4] Will Nelson's reports,[5, 6] at General Motors, the University of North Carolina findings,[7] and others proving that if a majority of our motorists regularly wore their belts that tens of thousands of lives could be preserved, millions of injuries prevented, and billions of dollars saved annually.

I presume that most of you have read the very extensive studies done by Ford,[8] based on National Safety Council data for accidents in 1969 and material from the Cornell Aeronautical Lab ACIR data bank which rated and compared various restraint devices and configurations for life-saving effectivenes.

They show that an estimated 5,000 people were saved in 1969, based on the assumption that lap belts got 30 per cent use, and the harness system one per cent. They went on to estimate that with complete restraint use, lap belts alone would have saved 15,700 lives, and full use of the current harness system would have saved 22,600 people.

Ah, but there is the problem, you say. Not enough people regularly wear their belts and all efforts to date to get them to do so have been unsuccessful and no one has come up with an effective way to substantially increase belt usage, including newspaper, radio and TV ads.

Ladies and gentlemen, whether you accept the statement that says only 17 per cent of all motorists regularly wear their belts,[9] or the ones reporting 25[10] or 40[11] per cent use, when you translate these percentages into the millions and millions of people they represent, you just can't write off the public education efforts of the past five years as a failure. And when you recognize that belt usage has tripled in that period of time, you begin to realize just how effective these public education programs have really been.

Thousands of people are alive today and millions more are whole and unhandicapped because these educational programs, as sporadic and limited in scope as they might have been, convinced these people to wear their belts. Be that as it may, we all deplore the present low belt use and we must find a way to increase belt usage to 75 per cent, to 80 per cent, to 90 per cent. We just can't wait until public education gets the usage to those levels.

A number of test programs conducted with starter-interlock systems have proved they are an effective means of quickly and dramatically increasing safety belt use, and further, that the majority of the non-belt users have no objections to using belts. As a matter of fact, these people acknowledge belts' protective and life-saving capabilities. It's just that most people have not been given the necessary incentive to wear their belts. It has been made quite easy for them not to wear them.

Until very recently, the automobile manufacturers have virtually ignored the problems of comfort, convenience, and ease of donning and wearing belts. You will note that I have repeatedly talked about an 80–90 per cent use rate being achieveable. This takes into account the fact that a small number of motorists, per-

---

[2] "A Statistical Analysis of 28,000 Accident Cases with Emphasis on Occupant Restraint Value," N. I. Bohlin, Volvo passenger car engineering department, reprinted in proceedings of the 11th Stapp Car Crash Conference, Society of Automotive Engineers, October 1967.

[3] "Efficacy of Seat Belts in Injury and Noninjury Crashes in Rural Utah," Jaakko K. Kihlberg, Cornell Aeronautical Laboratory, Inc., transportation research department, prepared for National Highway Safety Bureau, Department of Transportation, May 1969.

[4] "Seat Belt Use and Injury Patterns in Automobile Accidents," Jaakko K. Kihlberg, Shirley Robinson, Cornell Aeronautical Laboratory, Inc., automotive crash injury research, Buffalo, N.Y., December 1967.

[5] "Restraint System Effectiveness," W. D. Nelson, General Motors environmental activities staff, for presentation to the 15th annual conference of The American Association for Automotive Medicine, October 1971.

[6] "Lap-Shoulder Restraint Effectiveness in the United States," W. D. Nelson, General Motors safety research and development laboratory, presented at the Society of Automotive Engineers' Automotive Engineering Congress, January 1971.

[7] "Effectiveness of Lap-Seat Belts and the Energy Absorbing Steering System in the Reduction of Injuries," D. N. Levine, B. J. Campbell, University of North Carolina, highway safety research center, November 1971.

[8] "Effectiveness Estimates of Alternative Restraint Systems," Robert B. MacLean, automotive safety affairs office, Ford Motor Co., August 1971.

[9] "Motivating Factors in the Use of Restraint Systems," National Analysts, Inc., Philadelphia, prepared for NHTSA, September 1971.

[10] "An Efficient System for the Collection, Storage and Retrieval of Accident Information," R. A. Rogers, General Motors, August 1969.

[11] Traffic Accident Facts 1971 Edition," printed in Traffic Safety, publication of the National Safety Council, September 1971, p. 27.

haps as much as 10 per cent, have real or fancied objections to wearing belts. This minority will find a way and means of tricking or overriding or disconnecting any interlock or similar system. Incidentally, this is the same minority that will find the means of disconnecting or removing the air bag system or any other passive system they object to from their car.

I want to cite two of the starter-interlock test projects that have been conducted recently. In June, 1970, the National Highway Traffic Safety Administration [12] arranged for a fleet of GSA cars in Washington to be equipped with interlocks and test-driven for six months by government employees who regularly check cars out of the motor pool. Some of the devices were nstalled only on the lap belts, others on both lap belts and harnesses. In some cars a light flashed to warn the driver that the reason his car was not starting was because his belt wasn't fastened, while on others a buzzer provided this warning. Prior to checking out the car, all drivers were required to fill out questionnaires that indicated their driving experience, education in safety belt usage, and belt use frequency such as "never," "seldom," "frequently," and "regularly." After driving, follow-up reports recorded their reaction to the system: did they find it objectionable? did they consider it a good way to increase seat belt use? if it was included on their next car would they use it or have it removed or modified?

The results of the six-month test showed the system was well-received by a majority of the respondents; 71 per cent of all drivers stated they would accept or support the system. Over 80 per cent said it was a good way to increase safety belt usage, and about the same number would not object if the device were required on all new cars.

The most heartening report came from those drivers who previously never or seldom wore their safety belts, when 82 per cent of these expressed approval of the system. These people literally seemed to be saying "thanks for this way of making me wear my belt."

The test also indicated that after the first two or three times of being warned by the buzzer or light, the hooking-up of the belt became a habit, and the warning system was seldom activated. Six months after the completion of the test, a majority of those that had acquired the safety belt habit as a result of the test were still wearing the belt in their own car regularly. The result of this test proved conclusively that "such a device could significantly increase seat belt usage," to quote the report.

Subsequent tests have supported the findings of the NHTSA test. But none of these were extensive enough to necessarily be considered as representative of the national population.

Recently, however, a Ford-sponsored program [13, 14] conducted in Houston and Minneapolis greatly expanded the experience and data on this type of system. Eight hundred and five late-model Ford owners who confessed infrequent or no use of safety belts were screened for testing. Drivers were randomly selected to drive a new Ford for a period of time to get their reaction to certain new features. But the starter-interlock was not described or pointed out as being the object of the test. As a matter of fact, when the testing was completed, only 16 per cent of the Houston testers and eight per cent of their Minneapolis counterparts identified the true purpose of the test.

The drivers were divided into a test group and control group. Both groups drove identically-equipped cars except that the control group cars did not have starter-interlock systems installed.

As could be expected the seat belt behavior of the drivers in the control group, those cars without interlocks, did not change materially during the test period. Those subjects in the control group who reported that they used their belts almost never or less than half the time prior to the test, reported the same rate after the test was completed. However, 80 per cent of the Houston test group and 82 per cent of the Minneapolis test drivers reported changes in their seat belt use from almost never or less than half the time to more than half the time or almost always.

In the test cars, the starter-interlock system was also incorporated into the belts on the righthand front seat passenger and in Houston 78 per cent of the

---

[12] "An Evaluation of Safety Belt Interlock Systems," Michael Perel and Peter N. Ziegler, National Highway Traffic Safety Administration Research Institute, February 1971.

[13] "Interim Results for Test Drive No. 1—Advanced Features Interest Study," Dr. Dale J. Shaw, Behavioral Sciences Corp., presented July 19, 1971, to Ford Motor Co.

[14] "Interim Results for Test Drive No. 2—Advanced Features Interest Study," Dr. Dale J. Shaw, presented Aug. 30, 1971, to Ford Motor Co.

passengers said they used their belts more than half the time or almost always. With the interlocks, Minneapolis passengers reported seat belt use increased to 90 per cent. Near the end of the test unidentified interviewers rode in the car with the test subjects and 70 per cent of the Houston drivers and 86 per cent of Minneapolis drivers properly instructed their passengers to use their belts and interlock systems.

Opinions of the system were quite favorable with 68 per cent of the Texas drivers and 76 per cent of the Minnesota drivers stating they would have no objection or they would favor it becoming standard in all new cars. The minority that did not endorse or approve this system were then interviewed to determine what their reaction would be if such a system were made standard equipment. In answer to this, 74 per cent of the Minneapolis dissenters and 58 per cent of those in Houston indicated they would use the system, while only 24 per cent of the objectors said they would try to bypass it, and only two per cent of this group threatened to remove such a system.

Subsequent to this series of tests, Ford has been conducting a fourth phase [15] of this program with a logic interlock system, which requires the driver and the passenger to first be seated in the car and then to buckle their belts around them before they can start their car, a system more difficult to trick or override. At the time this paper was prepared the final results of the test of the logic start-interlock had not been published. However, I understand that in the Houston test group safety belt use rose from 0 to 90 per cent for those people now reporting they almost always wore their belts. And whereas 60 per cent of the people in this test group reported that they almost never wore their belts prior to the test, only four per cent did not wear belts at the end of the test.

A similar improvement in shoulder-harness use was achieved in the Houston group, with only two per cent reporting they almost always wore their harness before the test, but 74 per cent reporting harness use at the end of the test. Likewise, whereas 84 per cent affirmed that they almost never wore their shoulder harness prior to these tests, this figure was down to 12 per cent at the end of phase IV. It's further interesting to note that 56 per cent of the Houston group and 46 per cent of the Minneapolis group stated that if such a system was incorporated in their new car they would use it, while only 10 per cent of the Texans and six per cent of the Minneapolis people stated they would avoid using it.

Our industry believes that the Ford test program, the NHTSA and GSA programs, and others have demonstrated beyond doubt that the starter-interlock system would dramatically increase safety belt use, can increase belt use to the 75–90 per cent ratio that is desired. Here is a simple, readily available means of increasing safety harness protection. This device requires no extensive, long-term development but merely adaptation to various model cars. It is available now, and can be installed in production quantities for very little cost on all new cars within a matter of weeks. It makes use of a restraint system which is fully proven and is already installed in tens of millions of cars on the highways today. It has the added advantage that it can be retrofitted to older model cars that already have safety belt fittings. And my friends, don't underrate the fallout that will take place when many, many people start wearing their belts, even if their car does not have a starter-interlock system, just because everyone else is wearing theirs.

There is a second means of quickly and dramatically increasing safety belt usage that I would like to recommend to you today—mandatory use laws passed by the states and cities. A couple of years ago, such laws were dismissed as unfeasible and unenforceable. Today the climate is changing. In the few areas where such laws have been enacted, as in Australia and Brooklyn, Ohio, they are finding safety belt use up 50–70 per cent, traffic fatalities down 30 per cent in one area, down 50 per cent in another.

Authorities in these areas are finding the law no harder to enforce than that of drivers' licensing or car registration laws. They find that the vast majority comply simply because it is the law. In our country today the law breaker and lawlessness get the headlines. As a result, we tend to forget that the great majority of all Americans are law-abiding. When mandatory safety belt laws are passed, I predict 80 per cent or more of the motorists will become wearers regardless of how effective the enforcement will be. At present, it is reported that 10 states—West Virginia, Wisconsin, Ohio, Michigan, Arizona, New York, Rhode Island, Connecticut, Georgia, and Massachusetts—have had mandatory safety

[15] Unpublished results of phase No. 4 of study mentioned in reference 9.

belt laws introduced into their legislatures, and we expect in the next year eight-to-ten more states will consider passage of such legislation. Groups such as the Insurance Institute for Highway Safety and important government officials are reviewing their previous attitudes towards such laws.

Ladies and gentlemen, 200,000 Americans need not die on the highway before the air bag is available in most cars. The ways and means to cut this figure in half is available now in necessary quantities and at an appropriate price. The wholehearted promotion of the starter-interlock system and the urging of mandatory safety belt usage laws is the moral and professional responsibility of everyone at this conference. I urge your fullest support of these.

FORTUNE

April 1972

AUTO SAFETY NEEDS A NEW ROAD MAP

by William Bowen

Reprinted solely for the information of the members of the American Safety Belt Council

©1972 Time Inc.

Fourth in a series on embattled consumer products

The revolution Nader helped set off in the Sixties has

AUTO SAFETY

by William Bowen

Even in what looks like a pretty good sales year, a certain subdued and somber air prevails out in Detroit among the men who make and market the most embattled consumer product of all, the automobile. Along with a labor force growing less manageable, persistent consumer preferences for less-than-full-size cars, and the negative symbolism that cars have come to hold for many people, the auto makers are afflicted with escalating government regulation. When they look ahead a few years, they do not like what they see, and they're afraid their customers won't like it either when the time comes. The auto makers see emission standards badly impairing engine performance. They see bumper standards increasing length, weight, and price, although great numbers of consumers want cars that are short, light, and cheap. And, far from least, they see safety regulations relentlessly adding costs without adding commensurate consumer satisfactions.

The safety aspect is especially troubling because it threatens to be interminable. The failings that Ralph Nader originally attributed to the American automobile have now been just about remedied, but that has proved to be only the beginning. For the middle Seventies, the government has set standards that according to one Chrysler executive "go beyond the current state of the art and require invention on a stringent timetable."

The foreseeable collision between the industry and the regulators has now come to pass. Putting up the industry's first serious fight against federal safety standards, Chrysler Corp. and Ford Motor Co. (joined by American Motors, Jeep Corp., and an association representing the importers) have gone to court to petition against occupant-protection standards mandated for 1974 and later models. General Motors, while doubtless rooting for the petitioners, has decided to watch from the sidelines. A decision by the court is expected before long.

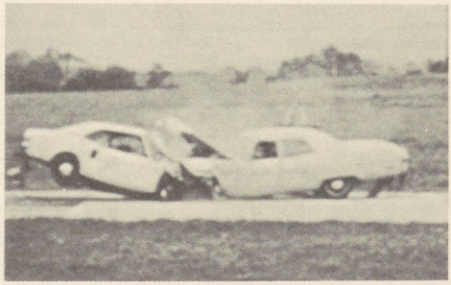
The biggest killer of youth

Whatever the outcome, the manufacturers know that a large federal involvement in automobile safety is both inescapable and appropriate. By any measure, violence on the roadways ranks among the nation's largest social problems. Last year some 55,000 Americans died as a result of motor-vehicle accidents. From early childhood through the twenties, trauma in motor-vehicle accidents is by far the most important cause of death. By the National Safety Council's estimates, motor-vehicle accidents account in a year for two million injuries "disabling beyond the day of accident." Permanently disabling injuries outnumber fatalities three to one. There are also huge costs in property

Research associate: Jo Degener



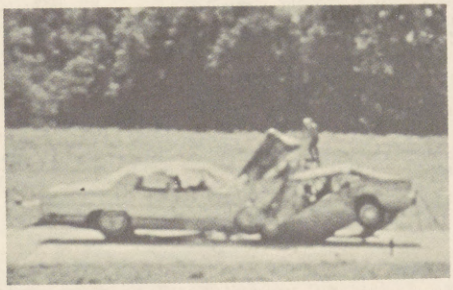
Ford Motor Co.: Galaxie vs. Pinto



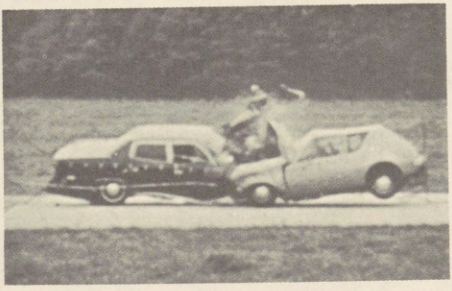
Chrysler Corp.: Fury vs. Colt

saved a great many lives, but for the Seventies

NEEDS A NEW ROAD MAP



General Motors: Impala vs. Vega



American Motors: Ambassador vs. Gremlin

If you are in a crash, you will be better off in a big car than in a small car. This lesson comes through vividly in a film made for the Insurance Institute for Highway Safety. It shows full-size sedans clobbering small cousins from the same corporate family in head-on collisions. Speeds ranged from forty-three miles an hour to just under fifty. The big cars got badly banged up, but in every case the passenger compartment remained intact. Passengers restrained by lap-and-shoulder belts might well have come through without grave injury. But not in the small cars. Their passenger compartments were severely deformed. It is hard to imagine that any kind of restraint system could have saved the life of anybody inside.

damage, delays and disamenities of various kinds, and in public services such as the time of policemen and judges. An effort by the National Highway Traffic Safety Administration to reckon the "total societal cost" arrived at a range of $40 billion to $45 billion a year.

Measured against the amount of traffic, however, the death rate in motor-vehicle accidents in the U.S. is much lower than it was in the early decades of the automotive age. In terms of deaths per 100 million vehicle-miles, the rate drifted downward from 18.2 in the middle 1920's to about 4.7 last year. (See chart on the following page.) Most of this decline took place without any help from federal safety standards. It was the result of, among other things, improvements in roads, drivers, and cars.

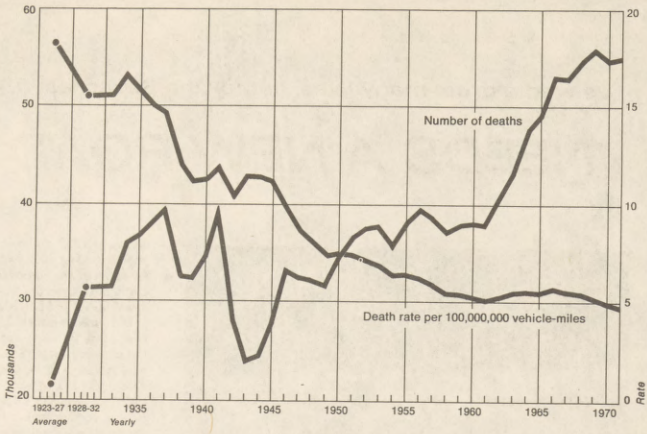
In the early 1960's the trend temporarily reversed, with reverberant consequences for the automobile industry. In 1962 and 1963 and again in 1964, the fatality rate edged upward, partly as a result of a large increase in the number of young drivers on the roads. In early 1965 the famous and prolonged Senate hearings on automobile safety got under way, and toward the end of that year Ralph Nader came out with *Unsafe at Any Speed*. The following year, an aroused Congress enacted the legislation creating the National Highway Safety Bureau (now the National Highway Traffic Safety Administration) and authorizing it to formulate and issue mandatory safety standards for the automobile industry.

Theory in a teacup

Along with these events came a revolution in thinking about automobile safety. For many years, safety programs had mainly emphasized efforts to prevent accidents by persuading people to drive safely. The new wave emphasized modifying the cars themselves so as to reduce the harm done by accidents. Nader, of course, was a leading advocate of this viewpoint. Another was Dr. William Haddon Jr., an intense, brainy physician who became the first head of the National Highway Safety Bureau. In expounding his philosophy of highway safety, Haddon likes to use the analogy of sending a teacup by mail. If you want to keep the teacup from getting broken, he argues, you don't waste effort trying to change the behavior of postal employees so they don't drop things. Instead, you package the teacup so that it won't break even if it is dropped. Likewise with car crashes. Since you can't change human nature enough to keep crashes from happening, the thing to do is package the occupants so as to minimize the harm.

Useful as it has been, the teacup analogy has its limitations. The difference in kinetic energy between an automobile moving at highway speed and a package falling from

THE DEATH TOLL RISES, THE DEATH RATE DECLINES



Data on motor-vehicle fatalities in the U.S. can be horrifying or encouraging, depending upon what set of numbers you look at. The total number of deaths has been generally rising since the early 1940's, and in recent years has been running above 50,000 a year. The death rate—deaths measured against vehicle-miles—has been generally falling since the 1920's. Looked at in terms of death rate, the U.S. does better in roadway safety than other industrialized nations, and very much better than some, including West Germany and Japan. Among total motor-vehicle fatalities, it should be noted, less than 65 percent are occupants of passenger cars. About 20 percent are pedestrians.

the hands of a postal employee is so enormous that the problems involved in protecting the contents are different in kind. What's more, the teacup uncomplainingly lets itself be closely and completely enwrapped for the journey. The sentient human being insists upon some measure of mobility and freedom—upon enjoying the journey, if possible, and not just enduring it.

In current thinking, unfortunately, these limitations of the people-packaging approach are sometimes lost sight of. Whereas before the revolution there was too little emphasis on modifying the car, now there is too much. In the preoccupation with occupant protection in the crash, not enough thought, research, or money is going into some other aspects of automobile safety.

Looking for short-run payoffs

Haddon is no longer the U.S. Government's top automobile-safety executive, having left that post in the early days of the Nixon Administration. As president of the Insurance Institute for Highway Safety, he still wields great influence. The measures and policies he advocates go beyond people-packaging—he favors, for example, greater efforts to eliminate or modify roadside hazards that cars crash against. But there is a heavy emphasis on "loss reduction," as he calls it, as opposed to accident prevention.

Haddon's successor Douglas Toms is vividly different from him in tone and style. Still somewhat boyish at forty-one, he has an engagingly casual air about him. A traffic administrator by profession, with an M.A. in that field from Michigan State, Toms appears to like cars and driving, and he displays little of Nader's (or Haddon's) hostility toward the automobile industry. Also, his view of automobile safety is broader than Haddon's, and very much broader than Nader's. Still, Toms feels that the best possibilities for short-run payoffs in reduction of fatalities lie in "crash survivability." And—perhaps inevitably in his post—Toms puts great emphasis on short-run payoffs.

It must be said that the occupant-packaging approach has been a great success. In the spotty story of government intervention to make matters better, it is not easy to find a nicer example of action followed by intended results. In 1966 the fatality rate was 5.7, highest since 1957; in 1967 it turned downward, and it has been going down ever since. Moreover, data assembled by H.E.W.'s National Center for Health Statistics show a marked decline in the severity of injuries since 1967.

Not all of this can be attributed to the safety revolution, to be sure. For one thing, the decline in the death rate undoubtedly has something to do with completion of additional stretches of the Interstate highway system—the fatality rate per 100 million vehicle-miles on Interstate roads is only about half as high as the over-all fatality rate. But the view that the occupant protection added to cars has helped a great deal is based on more than statistical inference—it is supported by the observations of seasoned accident investigators who have seen people in post-1966 cars survive crashes that would certainly have killed them in pre-1966 cars. One such observer is Donald F. Huelke, professor of anatomy at the University of Michigan medical school. Since 1961 he has gone to the scene of most of the fatal crashes in Washtenaw County, Michigan, and a great many of the nonfatal crashes too. Having seen with his own eyes the differences the safety revolution made, he sometimes says to audiences that "anybody who drives a car older than a 1967 model is a damn fool."

The innovations that made the most difference of all, Huelke and other experts in crash injury say, were the HPR and the EAC—the high-penetration-resistant windshield, introduced in the 1966 model year, and the energy-absorbing steering column, introduced in 1967. The HPR, with a strong layer of plastic between two layers of glass, keeps the occupant's head from going through when the glass breaks. The EAC, a segment of which crushes under heavy impact, greatly reduces stresses upon the chest in

frontal crashes. Both of these large advances in safety were developed by the automobile industry and introduced before the first federal requirements went into effect. Automobile executives point this out, but when they do so they are glumly aware that their companies get little or no credit for safety equipment added after 1965. They ruefully wish they had done more before 1965.

Auto makers now generally feel that government safety regulation served a good purpose. Speaking of both emission and safety standards, Chrysler Vice President Sydney L. Terry said in a speech last year: "On balance, we feel that the automobiles of today are better than they would have been had there been no government regulation . . . better citizens of our society." The automobile companies, in other words, have no basic quarrel with the idea of federal safety standards. The conflict has to do with where to go from here, and how fast.

Toms wants to push on toward making crashes "absolutely survivable." For 1974 and later models, he has set standards calculated to provide a high degree of survivability in frontal crashes as severe as collision with a rigid barrier—a stone wall, say—at thirty miles an hour. That is about equivalent to a crash into a parked car at *sixty* miles an hour, or a head-on collision of two cars of the same size moving at a combined speed of sixty (thirty-thirty, say, or forty-twenty). In a crash that violent, any unrestrained occupant would probably be killed or gravely injured.

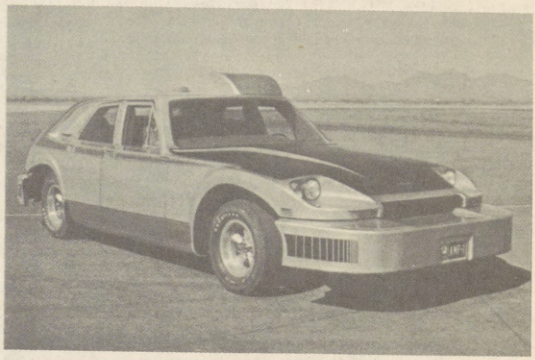
The lap-and-shoulder belts already in cars are capable of providing a high degree of protection in crashes as severe as the test the NHTSA has specified, and more effective belts with energy-absorbing webbing are under development. The NHTSA has ruled that for 1974 and 1975 crash-protection standards, lap-and-shoulder belts will be considered an acceptable restraint system. With the resolution of certain technical problems relating to the test specifications, the companies should be able to meet the standards for these model years.

"We don't tell people what to do"

The real crunch comes with the requirements for 1976 models. For that year, cars will have to meet the crash tests with a "passive" restraint system, meaning one that is effective without any action on the part of anyone in the car. Seat belts cannot meet this requirement. The auto makers say the only way they can meet the 1976 standards is to put air bags into the cars. Toms maintains that he is not requiring air bags for 1976. "One of the cornerstones of our program," he says, "is that we don't tell people *what* to do." In a sense this is true. But with the 1976 standards he has in effect left the companies no choice.

The job envisioned for the air bag is to sit and wait, perhaps for years, and then to spring into almost instant action. When the front of your car collides with something —a tree, a sign support, another car—a sensor up front detects the too-swift deceleration and, within a few hundredths of a second, actuates the inflation system. In the next few hundredths of a second, stored or generated gas (or a combination of both) inflates a cloth bag, and you smack into a cushion instead of the interior of the car. The bag rapidly deflates. In a little more than a tenth of a second it's all over: you may be badly shaken, but if it was a straightforward and not too violent crash, you are alive and perhaps not even badly injured.

The automobile companies do not dispute this concept. The basic question that Ford and Chrysler have raised is whether development of the air bag is far enough along that it can reasonably be relied upon to meet the requirements for 1976 models. This is a question that no one is equipped to answer with entire confidence. The truth lies buried under a thick gray rubble of legal and technical documents, and even if it could be excavated, it would prove to be far from simple. Crash-simulation tests, complex and variable enough in themselves, are only dim and simplified simulations of the real world in which air bags will be expected to operate. What's more, the air-bag controversy, as an engineer who belongs to neither camp puts it, "has gone past the rational stage." When an outside consultant says the noise of an inflating air bag is like the firing of a twelve-gauge shotgun and a government observer says it is like the firing of a cap pistol, can even a charitable third party believe *both?*





Safer at any speed than the cars in the showrooms are these "experimental safety vehicles" built for the National Highway Traffic Safety Administration. They are supposed to provide survivability (with air bags) in crashes as severe as fifty miles an hour into a solid barrier. The contractors were AMF Inc. (above) and Fairchild Industries. Each made two copies. Within the next few months, the NHTSA will decide which company gets the contract to build a dozen more for further testing. NHTSA engineers expect to learn some things that can be incorporated into ordinary automobiles in the late 1970's.

There would not be an air-bag controversy if enough people riding in cars equipped with seat belts would buckle up. Even the most ardent air-bag partisans at the NHTSA acknowledge that much. Abundant evidence attests that seat belts can save lives and reduce the severity of injuries. From analysis of data on actual crashes, researchers at the University of North Carolina's Highway Safety Research Center concluded that lap belts reduced serious and fatal injuries by 32 percent in front-end crashes and 43 percent in all types together.

Lap-and-shoulder belts, indeed, apparently provide more all-around protection than can be expected of air bags. Several years ago a Swedish study reported that in 28,000 road accidents not one instance had been found in which an occupant wearing lap-and-shoulder belts was fatally injured at a crash speed of less than sixty miles an hour. Last year G.M. engineer Wilton D. Nelson reported that among 228 documented instances of people involved in crashes while wearing lap-and-shoulder belts, there were no fatalities except in a few very severe collisions in which a tree or another car penetrated the passenger compartment. Some belted occupants came through with minor injuries, or none at all, in smash-ups that wrecked the cars.

Unfortunately, only a minority of the people in cars do buckle up. Field observations find over-all use running well below 30 percent. Last year a study sponsored by the Insurance Institute for Highway Safety observed rates of 16.3 percent for lap belts alone and 6.5 percent for lap-and-shoulder belts among drivers of 1968–71 cars in a major metropolitan area. In two small cities the corresponding rates were much lower, 9.3 and 1.3 percent. What's more, it is a well established point about seat belts that rates of use run much lower among people involved in accidents than among drivers in general.

Haunted by visions

The beauty of the air bag is that it finesses behavioral problems altogether. It is an egalitarian device, protecting the reckless as much as the prudent. To those who feel that it is paternalistic to compel people to buy air bags for their own protection, Toms replies that society decided long ago to intervene to keep people from committing suicide.

The auto makers raise more pragmatic objections. Ford and Chrysler, for example, point to the rebound problem. The passenger hurtling forward in a frontal crash will smack into the expanding air bag with quite a lot of impact. If he was facing straight ahead at the moment of the crash, the air bag should have pushed him straight back against the seat. But tests with dummies indicate that out-of-position occupants might suffer wrenched backs, twisted necks, or head injuries when they rebound from the bag. While recent improvements in air-bag technology have eased the rebound problem, it would take extended field trials, with air bags going off in real-world situations, to resolve the issue.

Another matter of concern—and one that troubles G.M. too—is reliability. Terribly uptight these days about product-liability suits, the auto makers are haunted by visions of air bags going off when they shouldn't or failing to go off when they should. Air-bag systems, sensors and all, will have to be reliable after traveling in cars for years, over tens of thousands of miles. Only extensive real-world field testing can provide reassurance here.

On balance it seems reasonable to insist that such testing be carried out before the NHTSA mandates the air bag in all new cars. This view is shared at, among other places, the University of Michigan's Highway Safety Research Institute. As one administrator there put it, "We'd better test the air bag first with real people in real cars on real highways." A one-year trial involving, say, 20,000 cars might at least serve to indicate how much additional testing is needed. If it seems inhumane to use 20,000 cars occupied by real people in an experiment that might involve injury to some of them, it should seem approximately 500 times as inhumane to perform the same experiment with a full year's sales run of, say, 10 million cars.

Airy remedies

Extensive field testing could help resolve another large question—whether lap belts should be standard equipment or optional once the air bag comes in. G.M. agrees with the NHTSA that belts should be optional. Louis C. Lundstrom, director of automotive safety engineering, says G.M. is working to develop an air bag to be used without belts. Lap belts would still be available "for people who want them and will pay for them." Most people would not want them, Lundstrom says, and to put in belts would add to the cost of the car without adding any benefit for those consumers. But on the more fundamental question of whether lap belts would provide additional protection for people who used them, Lundstrom is exceedingly reticent.

Ford and Chrysler make their position quite clear. In the blunt formulation of Ford engineer John A. Pflug, "Air bags aren't any good unless you have lap belts with them." Roy Haeusler, who is the Chrysler counterpart of G.M.'s Lundstrom, says it is "dishonest" to maintain that air bags can entirely substitute for seat belts.

Lap belts are needed with bags for two reasons, Ford and Chrysler men argue. Belts can help control the positioning and movement of the occupants when air bags are deployed, and so reduce the chances of injury on the rebound. Also, belts can provide some protection in the kinds of crashes in which the air bag will not help much: second impacts after the bag has gone off, side impacts, rear impacts, and rollovers.

Douglas Toms has answers to the argument that you need the belt for protection in crashes other than single frontal collisions, but on close inspection the answers are not very reassuring. For example, he indicates that frontals account for most of the crash fatalities, and cites a figure of 67 percent. The figure is misleading, and receives no discernible defense even at the NHTSA. Among motor-vehicle–occupant fatalities in all kinds of crashes—including rollovers and multiple impacts—single-impact frontals account not for 67 percent, but for somewhat less than 40 percent.

Also unreassuring is Toms's solution for the multiple-collision problem: the two-shot air bag, designed to reinflate if the sensor detects a second impact. It is unrealistic to talk about such a device as a mass-production item for 1976 automobiles. For one thing, protecting the apparatus so it could come through a violent crash in working order would involve severe engineering problems. Toms often shows this sort of airiness about technical matters. He tosses off technological remedies with what seems slender regard for problems of cost, reliability, or lead time.

Within the limits of realism about what technology may offer by 1976, the proponents of belt-with-bag appear to have the better of the argument. Besides helping to control rebound and providing additional protection in nonfrontal crashes, lap belts could provide some restraint in a frontal collision if the air bag fails to go off.

Another consideration here is that, in giving up on seat belts altogether, the NHTSA would sabotage efforts to

persuade people to use the seat belts already available to them. For several years after the first cohort of cars with air bags arrives, most of the cars on the roads will not have bags, and even after eight or nine years there will still be large numbers of bagless cars in use. In all of these many millions of cars, the only available passenger-restraint system will be seat belts. It is vitally important that we continue to seek ways to persuade people who will be riding in these cars to use seat belts.

Toms apparently feels that such efforts are futile. While that is probably true of simple exhortations such as "Buckle up!" it does not follow that factual and interestingly presented information about the value of seat belts would be ineffective. Advertising and promotional talents in the U.S. routinely put across goods and services that have much less going for them in the way of truth than seat belts have.

In the view of Professor Robert L. Hess, director of Michigan's Highway Safety Research Institute, the NHTSA "has failed its full responsibility to the public." It has required seat belts in cars, Hess declared not long ago, but has "done nothing of any significance" to get people to use them. "Passive restraint systems may be ideal, but they are not yet here. Is it necessary to allow 100,000 to 200,000 people to die sitting on their neglected lifesavers just to strengthen the demand for passive systems which could only be in the majority of our vehicles by 1980? I hope not."

Dead end ahead

The NHTSA's concentration on passive crash survivability carries over to—indeed dominates—another of the agency's high-priority programs, the Experimental Safety Vehicle. Aside from the competition between Fairchild Industries and AMF Inc. (see illustrations and caption, page 5), G.M. and Ford are building ESV's under $1 contracts. Much will be learned about crash protection, no doubt, but one lesson is already evident: as cars for consumers, the ESV's are all wrong. Even in mass production they would be too expensive for mass markets. And with crash protection taking up so much bulk, the cars are too big outside for the amount of passenger space inside. The three that exist in drivable form—the Fairchild, AMF, and G.M. versions—are full-size sedans outside, intermediates inside. The Ford ESV will provide more room but at the cost of more bulk and weight—it will be a Continental in length, a Galaxie in interior space.

The ESV's indicate the dead end that lies ahead along the passive-packaging route. They demonstrate that in the thrust for passive crash survivability, the added weight and cost and intrusion on passenger space will make automobiles unmarketable before making the occupants safe in collisions at highway speeds. The Toms goal of making crashes "absolutely survivable" is not rational. If safety efforts are to achieve large results within the frame of acceptable costs and disamenities, we will have to move beyond passive crash survivability, beyond the car itself, to the other elements of the system, roadways and people.

It seems obvious that new road construction in the U.S. should embody the best concepts and technology in highway safety. More troublesome, and not so clearly cost-effective, is the task of removing or modifying hazards along the millions of miles of existing federal and state roads. But Congress and the public will have to get over the idea that greatly increased automotive safety can be obtained on the cheap. Federal outlays for highways run close to $5 billion a year, and 10 percent of that channeled into safety work along existing roads might begin to make a difference in a few years if thoughtfully spent.

A major effort to remove or modify roadside hazards is overdue. Nearly one-quarter of all motor-vehicle fatalities occur in off-the-road crashes—the car runs off and either rolls over or smashes into something. Another 8 percent or so of the fatalities result when vehicles still on the road collide with hazards such as an end of a bridge or a pier supporting an overpass.

It is obviously impossible to eliminate all roadside crash hazards, but a great many can be removed or moderated at costs that do not seem excessive, when weighed against the costs of automobile crashes. Rigidly anchored signposts, for example, can be replaced with breakaway posts. These are of various types: some have a breakable cast-aluminum base; others attach to a concrete base (flush with the ground) by means of belts that run through open-ended slots rather than holes. Breakaways work. A crash at fifty miles an hour into a hefty post set in concrete and a crash at fifty into a breakaway post are events that belong to different orders of violence, and the degree of injury reduction is greater than that offered by any practical occupant-restraint system.

Still better than attenuation of the crash is avoidance of it altogether. Even when no one is killed or seriously injured, a crash of any severity entails mess, property damage, delay, and disamenity. Moreover, since there are practical limits in both packaging of occupants and moderation of roadside hazards, success in reducing the frequency of deaths and injuries will to some extent depend upon avoidance of the accidents that cause them. In current policies and thinking, the potentialities of accident avoidance are too much neglected.

Not entirely neglected, to be sure. Ralph Nader's publicizing of failures in vehicle components contributes something to crash avoidance. Some of the NHTSA's requirements for cars —side marker lights, low-glare surfaces in the driver's field of vision, etc.—are meant to have preventive value. In looking ahead some years, indeed, Toms sees increasing stress upon accident avoidance, though he characteristically envisions it in terms of far-out, or at least faraway, technology—he talks of "umbilical-cord cars" and "microwave systems to keep cars from crashing into each other."

Nader, Toms, and Haddon, however, appear to share the conviction that efforts to prevent accidents by influencing human behavior will be ineffective. The only striking exception here is involvement in efforts to influence the behavior of what might seem a rather intractable set of people, heavy-drinker drivers. Haddon's Insurance Institute has taken an interest in the drunk-driver problem, and the NHTSA has a large program of "alcohol countermeasures" under way—ranking, indeed, as one of the three high-priority programs, along with crash survivability and the ESV.

Six shots on an empty stomach

The reason for this concentration of interest is that drunk drivers are involved in a fantastically large share of the fatal crashes. By the NHTSA's rounded figures, 60 percent of the drivers in fatal single-vehicle crashes are drunk. So are 45 percent of the at-fault drivers in fatal crashes involving two or more vehicles. And 45 percent of the adult pedestrians killed by motor vehicles. And 50 percent of the drivers adjudged responsible for the deaths of sober pedestrians. These percentages are estimates based upon actual blood tests of accident victims and at-fault drivers at various times and places. Put them all together, and it works out that of all motor-vehicle fatalities in the U.S., 50 percent are "alcohol-involved," in that a person counted as responsible for the

accident was drunk.

In this context "drunk" has a special and precise meaning: a blood-alcohol content of 0.1 percent or higher. By normal cocktail-party standards, that is quite drunk. To get blood-alcohol content up that high, one authority observes, a man weighing 180 pounds would have to down six drinks (bottles of beer, one-ounce glasses of whiskey, or the equivalent) within one hour, on an empty stomach.

The NHTSA's "action programs"—they are really state or local efforts organized and partly financed by the NHTSA—emphasize rehabilitation of "problem drinkers," as distinguished from "social drinkers." The agency estimates that problem drinkers account for about two-thirds of the alcohol-involved fatalities. While the undertaking is certainly worthy of support, rehabilitation of problem drinkers sounds like slow work. In concentrating its efforts there, moreover, the NHTSA may be unduly neglecting possibilities of using law enforcement to deter social drinkers who sometimes drive while dangerously drunk.

Scandinavian countries have achieved impressive results by combining stern law enforcement with stringent definitions of drunkenness. Since 1967, the British have used a similar approach with considerable though not dramatic success. But in view of cultural differences, including differences in attitudes toward both drunkenness and driving, it cannot be assumed that these European programs are possible or appropriate models for the U.S. Large success in the U.S. may have to wait until the public becomes aware enough of the problem, and concerned enough about it, to support tougher control measures than can be widely applied in the present climate.

A gray glass in front of the eyes

The concentration of the NHTSA's accident-avoidance efforts upon drunk drivers fits in with the emphasis upon reduction in the fatality rate as the goal of safety measures. Alcohol is much more heavily involved in fatal crashes than in crashes generally. In the great majority of road accidents, the driver at fault is not drunk.

What can be done for, or about, sober drivers? B. J. Campbell, director of North Carolina's Highway Safety Research Center, believes that part of the answer lies in providing drivers with more and clearer information. One kind of information he has in mind is that conveyed by highway signs and markings. These should deliver precise and unmistakable messages, far enough in advance so that the driver has time to act upon them. Too often, says Campbell, the driver "has to make too many decisions in too short a time."

Half the fatal crashes occur at night, though traffic is only one-third as heavy as by day. Drinking has a lot to do with that, but experts in the field generally agree that reduced visibility is an important factor too. Improved visibility, indeed, may be of special value in helping to prevent drunk-driver crashes. It is a well-established fact that heavy drinking gravely impairs night vision. According to a classic statement of the matter, "Alcohol has the same effect on vision as the setting of a gray glass in front of the eyes, or driving with sunglasses in twilight or darkness . . ." It would be easy to increase the illumination from headlights, but in the present lighting configuration more illumination would also mean more glare as cars approach each other on undivided roads. In view of the great potential importance of increased illumination, the problem merits more research attention.

Lighting at the other end of the car also merits additional research. Says a report from Michigan's Highway Safety Research Institute: "The high frequency of rear-end collisions (i.e., over 60 percent of collisions involving more than one vehicle) suggests that drivers do not obtain adequate information concerning the movements of vehicles ahead of them." One important finding in the institute's own research on rear-end lighting is that the attention-getting quality of signals is improved "if different signal functions are not carried out by the same lamp." (In current cars, of course, some lamps do serve multiple functions.) Other rear-lighting possibilities that seem worth exploring for accident-avoidance potential include brake lights mounted higher on the car. For one thing, separation from tail lights should greatly increase the attention-getting effect of brake lights.

Drivers rely so much on their eyes to obtain information that it might be well to supplement visual information sources with an auditory system. Ford Motor Co. has designed and tested one, named Radio Road Alert. It uses a bank of about forty prerecorded messages, stored in a memory unit inside the car. The appropriate message is triggered by a small roadside transmitter as the car passes, and the driver hears it through his car radio, whether it is turned on or not. Because the transmitters would broadcast only very short distances, they would need very little power.

The inventors of the system envision three kinds of use for it. There would be permanent installations to tell motorists that, for example, the next exit lies one mile ahead. Police could set up temporary roadside units to warn of special hazards ahead—ice on the road, perhaps, or traffic slowing because of a collision. And transmitters in emergency vehicles such as fire engines, ambulances, and patrol cars could trigger warnings of their approach.

The most formidable problem in the way of large-scale adoption is economic, political, and governmental rather than technical: how to get the memory unit into enough



Bruises on the face and a minor cut on the hand—these were the only injuries suffered by the driver of this car, which went off the road, struck a tree twenty inches thick, and sideswiped three more trees. A lucky man? Yes, but also prudent. He had buckled up, and so became a case in a G.M. study of lap-and-shoulder-belt effectiveness rather than in the records of some hospital. The study showed that occupants wearing lap-and-shoulder belts usually came through crashes in much better shape than the cars.

cars quickly enough to make the system cost-effective. This is a far from trivial problem, but the potential value of the concept seems large enough to merit thorough exploration. At present the concept is dormant for lack of interest in Washington.

The most important obstacle

A federal safety program with a broad view would look for possible payoffs even in traditional sectors that are scorned in current thinking. The conventional wisdom with respect to high-school driver education, for example, is that such courses have little or no safety payoff. But it might be possible—through use of advanced driving simulators, perhaps—to get significant gains in skills without inordinate increases in costs. Federal support for experimentation along this line seems skimpy. Also, there might be worthwhile long-run payoffs from gradual escalation of driver-licensing standards. At least, the possibility deserves some serious study. Toms himself is interested in higher licensing standards, but budgetary pressures and the lack of indicated short-run payoff preclude any substantial investment of federal funds.

Even that most unfashionable sector of all, safe-driving campaigns, should not be scorned entirely. After all, a lot of private and public money is spent on such efforts, and a lot of valuable time and space in media is donated for them. It might be sensible to try to help make such efforts more effective, instead of just deploring them as useless. Urging people to "drive safely" probably *is* useless. But some psychologists think it might not be useless to tell people in interesting ways *how* to drive safely—how, for example, to avoid or deal with common accident situations.

If the NHTSA is to finance wider explorations of possible safety payoffs, it will need more money from Congress. The agency's budget this year comes to $146 million, including funds channeled to state and local agencies. That level of funding is not commensurate with the costs of motor-vehicle accidents. It reflects the mood of 1965, when it seemed that safety was primarily something the automobile companies could be compelled to provide, at small cost to the taxpayers.

But along with more money, some rethinking is called for. The NHTSA has been too much focused on reduction in fatalities as the objective and occupant packaging as the way to attain it. The federal government's involvement in automobile safety needs a broadening of vision with respect to both ends and means.

It is far from clear, however, where the impetus is to come from. Haddon still invokes his teacup analogy as if it were a bold new thought. Nader would surely resist any reduction in the emphasis on modifying cars. There is no conspicuous evidence of a new wave gathering in Congress. And the manufacturers have still not recovered enough of the prestige lost in the debacle of 1965 to be effective voices. So despite all the thunder about automobile safety in recent years, the federal effort is quite likely to remain underfunded, narrow, and fixated on passive restraints and short-run payoffs. It could be said in more than a merely paradoxical sense that the most important obstacle to progress toward a broader vision of automobile safety in the U. S. today is the spirit of Ralph Nader. END

Air Bags Need a "Good Belt"

Within a period of about one month, two government sponsored public demonstrations of air bag systems have ended in failure.

As evidenced by this collection of editorials, features, and news items, there is growing concern among journalists and citizens across the nation about passive restraints.

The public is alarmed by the Department of Transportation's hasty move into an area of new technology where the reliability of the device is questionable and sufficient "real world" testing is almost non-existent.

Few people realize that the federal passive restraint regulation also ends all requirements for safety belts.

The American Safety Belt Council believes motorists are best served if safety belt systems continue to be required by law along with air bags, until the latter are proved effective, efficient and economcial.

[From the Detroit News, Apr. 12, 1972]

Air Bags Need a "Good Belt"

(By Robert W. Irvin)

If the auto industry would develop a good safety belt system, it might be accepted by the federal government as an option to air bags which will cost three times as much.

This is the opinion of Prof. Larry Patrick, Wayne State University researcher who is a member of the government's National Motor Vehicle Safety Advisory Council.

Patrick spoke yesterday at a press conference called to discuss plans for the second international conference on passive restraint safety systems for cars. It will be held in Detroit May 22–25 under joint sponsorship of the Society of Automotive Engineers (SAE), the National Highway Traffic Safety Administration (NHTSA), and the North Atlantic Treaty Organization (NATO). The conference is part of the 1972 SAE national automobile engineering meeting.

Patrick said the governments' safety standard for 1976 does not require air bags as such. But it does require a "passive restraint system" which most people have taken to mean air bags.

However, Patrick feels that a good seat belt system might be accepted for 1976. He said the government is accepting an ignition interlock as an option for 1974 and 1975. It requires the seat belts to be buckled before the car can be started.

The Wayne State professor also believes if a good restraint system (seat belts with interlock) can be developed say, for $40, the NHTSA might accept it as an option instead of a $140 air bag.

He believes this would give car makers incentive to develop belt systems. He said papers at the conference will "point out tremendous improvements" made in belt systems.

Patrick said seat belts have not been accepted because "they are inconvenient to use."

He noted that because American manufacturers have favored hardtop car designs, the belts have had to be anchored in unusual positions. He also said the industry "has been remiss in not developing an integrated seat" to which the safety harness could be conveniently fastened.

He said putting the belts on inertia reels also would make a big difference because they allow people to move about and the belts are only locked in an accident.

According to Patrick, if the auto makers had only put a fraction of the effort into seat belts that they have put into air bags, here now probably would be a far more acceptable harness system at a fraction of the amount air bags may cost.

He also believes the seat belt interlock system "will make quite a difference in usage" and said one technical paper from a British engineer will be on a system which will make it difficult to bypass the interlock.

Patrick said another British researcher will report on a new passive safety system using a movable cushion. It would be lightly spring loaded so a person could move it until a crash, when it would lock in place in front of an occupant, cushioning him from the impact.

There has been some dispute about the 1974 portion of the safety standard, whether the manufacturers could meet the injury levels with belts or whether bags would be required even then.

Patrick said proposed changes in the government's severity index and development of new force limiting belts should eliminate any problem in passing the standard with harnesses.

Trevor Jones, a General Motors engineering executive who is conference chairman, said much of the conference will deal with the air bag systems and "the problems yet to be solved—the energy sources and the crash sensors."

Jones said the biggest single problem with the air bag system now is demonstrating it is an effective device in everyday use. He said that while tremendous progress had been made in developing the bags, the reliability still has not been demonstrated on user scale.

GM is going to put 1,000 cars with air bags into test service this fall. Based on accident statistics, GM has determined only 2.4 percent of them will be involved in injury-producing accidents.

But the test apparently is not large enough to give engineers confidence that the bags will work if installed in all cars. Jones said if all the objectives are met in the 1,000 car test, that this would only produce a 1.8 percent confidence level on systems installed across the board.

For a 99 percent confidence level in all cars, he said there would have to be a fleet test of more than 500,000 cars.

GM once had that as an objective, but Jones said that since then, two or three types of crash sensors have been developed as well as different inflation systems.

Speaking as a member of the government's advisory council, Jones said one reason the government hasn't launched a major test program was that it received a quote of $1,200 per car for each air bag system installed in the right front seat. The statutory limit on what the government can spend for an entire car is $1,800.

Both Jones and Patrick said such fleet tests on government and private vehicles are desirable for measuring air bag effectiveness. Patrick said fleet users regularly keep accident records, whereas these figures might not be as easily available for cars in general public use.

[From the Los Angeles Times, May 25, 1972]

The Air Bag Blows It Again

There was another public test this week of the automobile air bag, the safety device that is supposed to inflate at the moment of collision and prevent passengers in a car from being thrown around and injured. A test vehicle with a dummy driver was diven into a barrier at 30 m.p.h. Once again, alas, the bag failed to inflate, and the dummy was pitched into the windshield. At the previous and first public test of the air bag, the car was crashed at 50 m.p.h. The bag didn't work then, either, and one of the dummies inside was broken in half.

These ridiculous and frightening failures are important because the Department of Transportation says that by 1976 new cars will have to be equipped with so-called passive restraints—safety devices that require no human action to work—and the air bag is the most likely passive restraint that will be installed. The bags will replace seat and shoulder belts, which are of proven effectiveness in preventing death and serious injuries in collisions. The trouble is that most drivers and passengers are too lazy, stubborn or just plain dumb and won't use the belts. So the government plans to step in and try to do for people what they won't do for themselves.

The air bags will be expensive and will mean an unfair cost for those who use seat and shoulder belts. More seriously, they will be of doubtful reliability.

The bags and the charges that set them off are supposed to last for the life of a car; whether they will is another matter. They could malfunction and inflate at the wrong time, or, as we have seen, they may not inflate at all. It is increasingly clear that the air bags are a bad idea, and the best thing would be to forget about them.

[From the New York Times, May 24, 1972]

AIR BAG FAILS AGAIN TO INFLATE DURING A SAFETY TEST

(By Jerry M. Flint)

DETROIT, May 23.—An air bag designed to protect automobile passengers in crashes failed a test today.

The failure occurred at a news conference sponsored by the National Motor Vehicle Safety Advisory Council, a Government body that is pushing for the controversial safety device. On hand, complete with press kits, was the Allstate Insurance Company, which says "the air bag is ready."

Judson Branch, the chairman of Allstate, who is a member of the council, was on hand to speak for the bag and answer questions after the test.

A car equipped with an air bag was sent into a barrier at 30 miles an hour before assembled newsmen and television cameras. The bag failed to inflate and the dummy in the driver's seat went into the windshield.

"That's one of the hazards of the first time; it didn't work," said Lawrence Patrick, who conducted the test. Mr. Patrick is a professor at Wayne State University and a member of the council.

Mr. Branch did not wait to answer questions but left immediately after the failure.

A few weeks ago, in another highly publicized crash test of an experimental safety car, another air bag failed to go off.

The bag, to be stored in the steering wheel or dashboard, is to inflate and catch a rider who's pitching forward in a crash. In theory it's a near-perfect safety system since the rider does nothing—no seat belts to put on, for example—and the bag is to go into use only in a serious crash.

The problem is that the device has to work perfectly; it must never go off inadvertently because this would probably cause an accident; it must never fail because this would give the rider no protection.

In addition, there are a variety of problems: A potentially explosive device must be produced in factories; the bag must remain reliable after years of car abuse; the noise of inflation might damage the ears; the manufacturers to be liable after cars are junked and a bag fails.

The Federal Government has ordered systems such as air bags on 1976 cars. The car manufacturers say the air bag is a good idea and are working to develop the system, but they insist much more testing is needed. Critics of the auto industry say the manufacturers are using delaying tactics and the bag is ready now.

Allstate, for example, showed films of the bag working in a crash test "to dispel some of the unfounded fears" about the air bag.

"The air bag's present potential for saving thousands of lives and preventing serious injury is so great that mandatory front seat installation should proceed without unnecessary delay," said the insurance company's statement, given out before today's test failed.

The council, which makes safety recommendations to the Government, put out a statement to make "public its confidence in the air bag as a passive restraint safety system."

"The safety factor of the air bag under laboratory or controlled conditions has been, and is being, proved constantly," said the council's statement before the latest test failed. The council has called upon John A. Volpe, Secretary of Transportation, to push for widespread testing in fleet cars, such as those owned by the Government or police departments.

Mr. Patrick said that air bags that would be placed in cars would be more likely to work than handbuilt prototypes such as that tested today.

"This just means that our batting average has dropped from .500 to .333," said one member of the Government advisory council.

[From the Washington Post, Apr. 19, 1972]

Car Survives, "Occupants" Die in U.S.-Financed Test

(By Jack Eisen)

Phoenix, April 18.—With a muted "clunk" a federally financed experimental safety automobile was smashed into a steel wall at a speed of 49 mph near here today, with mixed results.

The car survived, looking barely dented by the impact, but its occupants—three man-sized dummies—did not.

Air bags, which were supposed to inflate instantly on impact to restrain the dummies, failed to work. As a result, the heads of both dummies in the front seat were thrown against the windshield, the torso of one was torn in two, and the dummy in the back seat was propelled against the front seat headrest.

Douglas Toms, administrator of the U.S. Department of Transportation's National Highway Traffic Safety Administration, said it was obvious human occupants would have been killed.

Although officials refused to speculate on the air bag failure, some automotive experts suggested among themselves that electric wiring that would have set off the air bag controls may have been detached during a brief halt in the countdown 12 minutes before the crash.

Despite the malfunction, Secretary of Transportation John A. Volpe and several aides, including Toms, hailed the tests as a substantial success.

"I'm not disturbed at all that this is a setback, because we're testing," Volpe said, asserting that the tests provided evidence that a structurally safe car can be engineered.

Carl Roberts, deputy program director for Fairchild Industries, Inc., which produced the car on Long Island, said he was disappointed but not disheartened. He cited the same reason as Volpe.

The demonstration was the first public viewing of one of the test cars being put through its paces. About 300 persons, mainly representing governmental bodies and foreign and domestic makers of automobiles and components, watched at a 157-acre test site on the desert about 17 miles north of here.

At a secret test March 31, a similar car made by AMF, Inc., was smashed into the barrier at the same speed. A film shown today showed that it, too, survived structurally but that its air bags worked, restraining the dummy passengers.

A current model standard car also was propelled into the wall. Its front end crumpled into an accordion-like tangle of steel. Clearly, no passenger could have survived.

John Edwards, associate administrator for research of the Highway Safety Administration, said data from a series of tests on both cars and the dummies will be evaluated.

Then either Fairchild or AMF will be chosen to build 12 more prototypes for further tests. The four experimental cars built to date cost more than $4 million.

Under federal specifications, each of the safety cars must provide protection to occupants in a head-on crash at 50 mph, a roll-over at 70 mph, or a side impact at 30 mph.

Today's test was surprisingly unspectacular. The car, loaded with instruments feeding data into computers through 94 channels by microwave and an attached cable, was pulled along a 1,200-foot guideway by a cable attached to its underframe. The car engine was not running.

The car hit the barrier with a "clunk" sound barely audible to spectators on bleachers 50 yards distant, and bounced back a little more than five feet, its back end rearing slightly upward.

The front bumper, which extends 30 inches forward of the car body and is cushioned by twin hydraulic cylinders, was crumpled. The hood was so undamaged that a test technician raised it effortlessly. The radiator sprung a leak, but the car's fuel system was intact.

When spectators were permitted a close view of the car they saw the dummies in the front seat sitting upright. But marks on their heads matched large bubbles in the windshield, made of a special soft, resilient glass. The dummy in the back seat was slumped.

[From the Washington Post, May 24, 1972]

Air Bag Test Fizzles, Dummy Hits Windshield

(By David C. Smith)

Detroit, May 23.—Just shortly after Allstate Insurance Co. said here today that a human volunteer had come through an auto air bag barrier crash test in Arizona unscathed, an air bag test involving a dummy at Wayne State University's auto safety center in Detroit failed.

Allstate's revelation and the Wayne State test were part of a program put on by the Department of Transportation's National Motor Vehicle Safety Advisory Council. M. Judson Branch, Allstate chairman, is also chairman of the advisory group. He is perhaps the leading proponent of the air bag "passive" restraint system.

As part of the advisory group's conference here, Allstate showed a film in which a human volunteer was unharmed in a barrier crash at 17⅕ miles per hour—a force equal to hitting a parked car in the rear-end at 35 miles per hour.

The test, conducted by an independent automotive testing facility in Phoenix, is believed to be the first in which a human volunteer was used in a regular production car (1972 Mercury Monterey) without wearing any special padding, helmet or other protection.

He sat on the front seat passenger's side of the car and in the crash was protected by an air bag which performed "perfectly". He also was wearing a lap safety belt.

Allstate, of course, underscored that the test demonstrated "the realiability of production-built, air-bag equipped cars."

In the Wayne State test, conducted "live" for newsmen, a 1969 Chevrolet Impala sedan equipped with an air bag installed within the steering wheel housing was crashed at 30 miles per hour into a barrier at the university's auto safety laboratory.

The air bag failed to inflate, sending the dummy's head first into the steering column and then crashing into the windshield.

Dr. Lawrence Patrick, Wayne State safety expert and a member of the DOT advisory council, could only say "this is most embarrassing." He speculated that a short circuit caused by pinching of wires connecting the battery's power to the device activating the bag had caused the misfiring.

"It was a case of human error, and I take full responsibility," said Dr. Patrick. "We had such good success with our tests in the past that I didn't feel it was necessary to go though all the usual preliminary testing procedures."

The air bag failure ended the advisory council's program acclaiming the advantages of air bags.

Air bags or other passive restraint systems will be required on all new cars starting with 1976 models. Detroit's auto makers generally are not enthusiastic about air bags, pointing out that they have many drawbacks including reliability at this stage of development.

[From Automotive News, May 29, 1972]

Air Bag Proves a Bust

(By Richard A. Wright)

Detroit.—It started out as a public relations man's dream, but within 30 milliseconds it turned into a nightmare.

The occasion was a press conference scheduled by the Department of Transportation's National Motor Vehicle Safety Advisory Council for the purpose of kicking off a publicity campaign to sell the public on air bags.

It was held in Detroit, heartland of opposition to the air bag, in conjunction with the second International Conference on Passive Restraints, sponsored by DOT, NATO and SAE.

The scene was the Biomechanics Laboratory at Wayne State University, where Prof. Lawrence Patrick has been conducting highly significant crash tests of restraint systems for the past several years.

The automotive press was out in force and officials from the Transportation Department, air-bag suppliers and Allstate Insurance milled about the highly utilitarian laboratory, stepping over wires, rails, boxes and various pieces of electronic equipment.

A highlight of the press conference was the first public showing of a film of some impressive tests conducted for Allstate with air-bag-equipped Mercurys by Dynamic Science, an independent automotive testing facility in Phoenix.

The film showed a car being driven swiftly over an incredibly rough road and then driven up and off a ramp at 45 miles per hour. It came to the ground with a force of 26 Gs.

The purpose was to show that the public has nothing to fear from inadvertent firing. In no instance did the bag fire when it was not supposed to.

The most spectacular segment of the film showed a crash into a barrier at 17.6 miles per hour with a human volunteer in the car. The bag popped open and kept him from hitting the windshield.

An Allstate spokesman said this was believed to be the first test of a live volunteer in a production-built, air-bag-equipped automobile in an actual barrier crash—without any special padding helmet or protection, wearing only street clothes and a production lap belt.

The press was implored to take word of these tests to the public, to let it know that it has nothing to fear about the reliability of air bags.

Patrick then announced that a demonstration air-bag crash was ready to go. A car's passenger compartment outfitted with an air bag and a single dummy behind the wheel raced down the track.

It impacted with a dull thud. There was no explosive sound, no billowing air bag. The dummy's head smashed the windshield.

The crowd was stunned, then began to murmur.

The air bag had failed to fire.

In the confusion, one government man noted that "the bag goes up and goes down awfully fast." But it hadn't.

It was later decided to stage a static firing of the air bag. It still wouldn't fire.

The PR man who clearly wished he were anywhere else asked the press if it had any questions for the council members.

[From Automotive News, Apr. 24, 1972]

Air Bags Fail; Extended Bumper Protects Test Car

Phoenix.—Three air bags in Fairchild Hiller's experimental safety vehicle failed to inflate in crash tests conducted here.

The reason for the failure was not available at press time. Analysis of the test results is expected to be available in two weeks.

Traveling along a groundmounted monorail at 50 miles per hour, the experimental vehicle crashed into a barrier with three dummies unsecured by seat belts. There was damage to the front end and the dummies. The front half of a conventional car was demolished in a similar earlier test.

Scientists with Dynamic Science, while conducted the tests, said the simulated accident was equal to a head-on collision between two cars at 50 miles per hour.

The bumper portion of the Fairchild car appeared somewhat damaged, but the back two-thirds was virtually unmarked.

One of the main reasons for the light damage, scientists said, was the bumper, which automatically extends one foot in front of the car at speeds of 30 miles per hour or faster.

Scientists said the car had a normal V–8 engine mounted in the front and was required to have better than average braking, handling and accelerating ability.

Final Arguments Are Made in Air-Bag Case

Cincinnati.—A panel of three judges was slated last Thursday to hear oral arguments in the U.S. Sixth Circuit Court of Appeals here in the auto makers challenge of the government standard which would put passive restraints—probably air bags—in all 1976 cars sold in the U.S.

The arguments were to come a day after failure of an air bag in the test crash of a Fairchild experimental safety car. The only way the failure could figure in the case, however, was if the judges read about it in newspapers.

Two hours were allotted for the arguments by litigants on both sides, which led one of them to remark that would be barely time enough to introduce the litigants.

When will the decision come? Speculation ranged from "soon" to June.

[From the Detroit Free Press, May 24, 1972]

Air Bag Fails Test at WSU

(By Tom Kleene)

For the second time is as many months, an air bag passive restraint system failed to inflate Tuesday in a crash test arranged to showcase the system's reliability in protecting occupants in a collision.

As the vehicle hit the barrier in a Wayne State University laboratory at a speed of 30 miles an hour, the head of the unrestrained dummy at the steering wheel smashed against the windshield with a force that cracked the glass.

The air bag, which was supposed to inflate and provide a protective cushion for the driver, meanwhile, remained inactive in its steering column housing.

A prestigious audience of delegates to the Second International Conference on Passive Restraints, members of the National Motor Vehicle Safety Advisory Council (NMVSAC) and officers of Allstate Insurance Cos. was flabbergasted.

"This is most embarrasing," said Lawrence M. Patrick, an NMVSAC member and a Wayne expert on automotive safety, who was in charge of the demonstration.

NMVSAC chairman Judson B. Branch, also chairman of the executive committee of Allstate Insurance had been scheduled to answer newsmen's questions after the test, but left before he could be questioned. An aide said that he had to catch a plane to keep a previous engagement.

Since March, Allstate employes have been operating 200 Mercury sedans equipped with right front seat air bags in a joint field test with Ford Motor Co.

Awaiting the outcome of an investigation of the air bag failure, Patrick speculated that it was due to a short circuit caused by the pinching of two wires connecting the battery power supply to the activating device.

"It was a case of human error, and I take the full responsibility," he said. "We had had such good success with our tests in the past that I did not feel it was necessary to go through all of the usual preliminary testing procedures."

Human error was also blamed for the failure of an air bag system to deploy in the crash test of a government-sponsored Experimental Safety Vehicle in mid-April in Arizona.

An investigation of that case showed that two wires connecting the pressure switches and the air bag electrical control box had been reversed by the manufacturer in the assembly process.

The crash test of the 1969 Chevrolet Impala sedan at Wayne State was supposed to be the climax of a program during which NMVSAC members and Allstate officers acclaimed the reliability of the air bag system.

Allstate vice-president Donald L. Schaffer, reporting on the company's fleet experience with air bags, said that there had been "three or four fender-bending type of accidents" involving the Mercurys. He said that none of these was at speeds that triggered the restraint mechanism.

"Many people have thought that air bags might inadvertently fire as the cars go down the highway, but Allstate's experience is showing this does not happen," Schaffer said.

The insurance company also showed a film in which a live human volunteer emerged unharmed from a 17-mile-per-hour barrier crash of one of its air-bag equipped Mercury sedans. "The air bag went off, performing perfectly," Allstate said.

NMVSAC officials said that the council, which works closely with the Department of Transportation on automotive safety, would continue to press for widespread testing to assure air bag reliability under actual driving conditions.

"What is now needed is a series of public tests under actual driving conditions," said NMVSAC member William Raftery.

"The batting average on air bag tests was .500 until today and now it has dropped down to .333," said NMVSAC member Henry Hill, referring to the two earlier Experimental Safety Vehicle tests, one of which was successful.

"But as of this moment, I am convinced that this is the one (passive restraint) device for which there is the most hope."

[From the Elyria (Ohio) Chronicle-Telegram, May 8, 1972]

THOSE INFLATABLE AIR BAGS

The operation was a success but the patient died. That's an old weather beaten joke, but it seems applicable to tests last month on air bags on an experimental automobile that were supposed to inflate automatically and save the occupants' lives in a collision.

The air cushions didn't inflate on impact, and had the car contained human beings instead of dummies, they would have died. Secretary of Transportation John A. Volpe says an error in electrical wiring caused the failure. Two wires connecting pressure-controlled switches in the front bumper with the air cushion control box had been reversed during assembly. When the error was corrected, the test was repeated and the cushions inflated.

These were only tests, of course. But with a complicated system, we wonder how often a similar error would be repeated in mass production. The air bags rely on electrical impact sensors. These activate an explosive mechanism which releases gas or compressed air, inflating a large nylon bag which pops out of a hidden compartment to impose a cushion between the passenger and the dashboard. All this occurs in 40-to-60 thousandths of a second.

And this system must be perfected in time for installation on all 1976 autos which must go into production in about three years. This is a governmental decree; and the new device presumably will eventually replace the lap belts and shoulder restraints.

Testing is far from complete. We do not yet know the effectiveness of air cushions in secondary collisions or rollovers after their initial impact.

We only know that a White House study concludes that the benefits of wearing seat belts outweigh the cost; and that the cost of air bags may outweigh the benefits.

The Department of Transportation appears to believe the only way to compel auto manufacturers to install safety devices is to set firm deadlines. But the reversal of two wires on the test car is only one example of the need for careful experimentation. The triggers must be so sensitive that they will not fire in response to minor bumps of parking or of bumper-to-bumper traffic. The sensors and gas containers must remain ready for split-second activation for a number of years under varying temperature, atmospheric pressure, vibration and other environmental conditions.

A House committee questions whether air bags will protect a passenger who is "out of normal seat position" at the moment of impact. There is no claim that air bags would offer protection against panic stops, skids or sideswipes.

We endorse the experiments, and even hope something better can be developed. But before every new-car purchaser is required to pay the cost of an air cushion, shouldn't intensive testing over a long period be a sensible procedure?

Meanwhile, we subscribe to campaigns promised by Ford and General Motors to make use of lap and shoulder restraints compulsory. Only about 30 per cent of us use lap belts, and less than 5 per cent are thought to use shoulder belts.

Such a law would be difficult to enforce, but seems worth a try. The 1974 autos will have an ignition interlock system which will prevent the car from being started until the front seat passengers have buckled up. But that's in the future, and a lot of pre-1974 cars will be on the roads for a long time. The same is true for the more costly air cushions.

With a law requiring use of belts, we could save lives in the intervening years, and take the necessary time to determine whether air bags are the final answer.

We have pleaded for years for a reduction in the highway slaughter, but shouldn't we at least test out new programs before we require an industry to spend millions which will be passed along to the consumer?

[From the White Plains (N.Y.) Reporter Dispatch, May 25, 1972]

THE AIR BAG THAT WOULDN'T

For the second time within a few weeks, publicly staged experimental car crashes designed to test the efficacy of air bags have found the latter wanting.

This week's misadventure in Detroit occurred at a news conference sponsored by the National Motor Vehicle Safety Advisory Council, a government body that favors mandating the air bag as standard auto equipment.

A test car slammed into a barrier at 30 miles an hour—enough impact presumably to inflate the air bag and pinion a dummy safely against the driver's seat. But the bag didn't inflate, the dummy's head was thrown against the windshield and a lot of people trying to prove a point were lugubrious about the whole thing.

The air bag has been timetabled as standard equipment on 1976 cars, but manufacturers have been contending that the deadline might have to be extended to allow for foolproof development and sufficient testing.

So it would seem. This particular contraption was controversial from the start and still is. While the concept and physical principle are sound, practicability remains something else again.

Before the air bag can responsibly be mandated, there has to be greater assurance that it will do what it's supposed to do—inflate in a crash. There also needs to be reassurance that it won't do what it's not supposed to do—cause an accident by reacting to a bump, a pothole or even nothing at all.

[From the Detroit News, May 24, 1972]

Failure of Second Air Bag Test Casts Doubt on Its Future

(By Robert W. Irwin)

For the second time in little more than a month, a well-publicized air safety bag test in a car has flopped.

In both cases, the bags failed to inflate and the dummy in the car slammed into the windshield. A passenger in a similar spot could have been seriously injured or killed.

The double faliures tend to support the position of auto manufacturers who say more development time is needed and the government should delay its requirement that all 1976 model cars have air bags.

The latest failure came yesterday at a Wayne State University laboratory.

Prof. Lawrence Patrick sent a standard Chevrolet sedan into a crash barrier at 30 miles an hour. But the air bag mounted in the steering wheel did not go off as it should have to protect the dummy in the driver's seat.

The test was being publicized by the National Motor Vehicle Safety Advisory Council, of which Patrick is a member. Council members were present to witness the test.

A council spokesman said afterwards there was no word on what caused the system to malfunction.

The earlier failure came in April at a test in Phoenix of one of the federal government's experimental safety vehicles. That was blamed on a defect in manufacturing the air bag system.

The council spokesman said yesterday the double failure "has strengthened the council's position that air bags must be tested on a widespread basis throughout the country before the general public can be allowed to use them."

The only continuing test to date is being conducted by Allstate Insurance Co. It has purchased 200 new Mercury cars equipped with air bags and they are being used by Allstate employes. One of these cars was crashed with a human volunteer inside and the air bag, working as planned, protected him.

Judson Branch, head of Allstate and chairman of the Safety Advisory Council, was present at yesterday's failure and was obviously embarrassed by it all because he disappeared immediately from the lab.

One aide claimed Branch had to catch a plane, although earlier observers of the test had been told he would be there to answer questions on air bags, which he strongly supports.

In fact, in conjunction with the Wayne State Test, the council issued a press release in which Branch said "the air bag makes crash survivability a present day possibility."

But Patrick admitted the double failure is going to hurt public confidence in the system.

"This wasn't a production unit, at all," Patrick said, "and there should be no reason to consider that this has any effect on the system's reliability.

"This was a handmade unit and, when you do something this way, there is always the possibility something will go wrong. In production, it will be built with production fixtures.

"In the case of the Phoenix failure, it was a miswiring of one of the connectors; a technician interchanged two wires. In production, these wires would all be in a harness and they would be soldered to the right pins."

Patrick wasn't sure what caused yesterday's failure.

"We tried twice more to fire it," he said, "and it wouldn't go out so we had to go through each section to eliminate things like the sensors and the power supply as being responsible."

He wasn't sure if a real passenger would have survived. The dummy cracked the windshield and compressed the energy-absorbing steering column several inches.

"People have survived crashes of this sort because the column is very effective in reducing injuries," he said.

"We have had 150 successful air cushion inflations with no trouble. It's just unfortunate that this one didn't go off at a crucial time when everybody was watching.

"I felt like digging a foxhole in the concrete. I also feel like leaving the country but I guess I won't."

Patrick said of the government's 1976 timetable:

"I think it would be a tragedy if they put these systems in before we had a reasonable sample on the highway to know what will happen to a production unit. It is imperative that we move as far as possible to get substantial numbers on the highway."

[From the Jamaica (N.Y.) Long Island Press, May 24, 1972]

Air Bag Flunks Its Crash Test

Detroit.—In a "most embarrassing" demonstration, an air bag passive restraint system failed to inflate yesterday in a crash test arranged to prove the air bag's reliability.

The dummy driver in the car broke the steering wheel and cracked the windshield with its head as the test vehicle slammed into a barrier at 30 miles per hour.

The air bag, which was supposed to inflate and provide a protective cushion for the driver, remained inactive in the steering column housing. The deploying mechanism apparently was damaged in the crash as technicians were unable to fire it manually.

[From the Chicago Sun-Times, May 24, 1972]

Air Bag Fails in Exhibition of Safety

Detroit.—A demonstration supposedly designed to show the life-saving potential of air bags in auto crashes fizzled Tuesday. The air bag failed to fire.

The demonstration was a joint venture of the National Motor Vehicle Safety Advisory Council, Wayne State University and Allstate Insurance Companies.

Larry Patrick, director of Wayne State's Biomedical Laboratories, said he was unable to determine immediately whether the failure was in the wiring mechanism of the test vehicle or in the bag itself. But he said he suspected the former.

A dummy driver riding in the test vehicle pitched violently into the windshield as the vehicle hit a barrier at 30 miles per hour.

Air bags or some other passive restraint system have been ordered built into 1976 model cars by the U.S. Department of Transportation. In an air-bag system, a sensing device explodes air-filled bags from under the dashboard to cushion momentarily, then deflate in a crash.

[From the Chicago Tribune, May 24, 1972]

One Air Bag Works; Second Is a Failure

Detroit, May 23.—A demonstration supposedly designed to show the life-saving potential of air bags in automobile crashes fizzled today.

The air bag failed to fire.

The demonstration was a joint venture of the National Motor Vehicle Safety Advisory Council, Wayne State University, and Allstate Insurance Companies.

Larry Patrick, director of Wayne State's Biomechanical Laboratories, said he was unable immediately to determine whether the failure was in the wiring mechanism of the test vehicle or in the bag itself. But he said he suspected the former.

DUMMY IS USED

A dummy driver riding in the test vehicle pitched violently into the windshield as the vehicle hit a barrier at 30 miles per hour.

However, the sponsors of the test said experiments held earlier this month indicated the air bags do work. In those tests, an auto carrying a live passenger crashed into a barrier at 17½ miles an hour. Damage to the auto was $1,853, but the passenger was unharmed, they said.

Allstate said this was believed to be the first collision test of a production-built, air bag-equipped car in which a passenger rode, wearing only street clothes and a seat belt.

Allstate said the test also served to dispel "unfounded fears" which consumers have over air bags, such as premature deployment or failure to deploy when needed.

The company said the bag activated in the barrier crash in a fraction of a second after impact, and deflated within one-half of a second.

Air bags or some other passive restraint system have been ordered built into 1976 model cars by the United States Department of Transportation. In an air-bag system, a sensing device explodes air-filled bags from under the dashboard to cushion momentarily, then deflate in event of a crash.

Judson Branch, chairman of the advisory council, said in a news release distributed at the demonstration today that "the air bag makes crash survivability a present-day possibility," and that what is now needed "is a series of public tests under actual driving conditions."

TEST FUNDS SOUGHT

The council news release said that "consumer confidence in the air bag is of critical importance to its acceptance" and that the council had urged Congress "to provide the necessary funds so that the system can be tested in a substantial number of vehicles under normal driving conditions."

[From the Washington Daily News, May 24, 1972]

AIR BAG FAILS TEST

DETROIT.—An air bag placed in a test vehicle to prove its realiability failed to deploy yesterday. The dummy in the car broke the steering wheel and slammed its head into the windshield in the 30-mile-an-hour crash.

The demonstration was presented by the National Motor Vehicle Safety Advisory Council to show that "the safety factor of the air bag under laboratory or controlled conditions has, and is being proved, constantly."

The air bag, which will become a required safety device on all cars in 1976, had been placed in the steering column of the test vehicle at the Wayne State University Bio-Mechanics Center.

The vehicle, with just the one dummy inside, was propelled into the barrier to simulate a car crashing into a fixed object at 30 m.p.h.

The deploying mechanism apparently was damaged in the crash as technicians were unable to fire it manually.

University Prof. Lawrence Patrick blamed the failure partly on human error, adding the bag being used was two-year-old hardware and was not properly tested prior to the demonstration.

Judson Branch, chairman of the council, which is part of the U.S. Department of Transportation, had been scheduled to talk to newsmen after the demonstration, but left before newsmen could question him.

An associate said he had to catch a plane.

Another member of the council, William Raferty, chairman of the group's consumer information committee, said the failure did not prove anything.

He said it did show why the council is urging a broad-based field testing program to convince the public of its reliability.

Douglas Toms, head of the National Highway Traffic Safety Administration, told top auto industry leaders Monday that the government does not plan to back down on requirements for passive restraint. Industry engineers see no way of meeting the requirements, except with the use of air bags, but are working hard at developing alternative systems such as passive seat belts and shoulder harnesses, and ignition interlock systems.

[From the Ann Arbor News, Apr. 30, 1972]

"POOF!" GOES THE AIR BAG AND HOPE FOR EARLY SUCCESS

The highly touted air safety bag which some day may be standard equipment on American cars has had some of the air let out of it, deflating its potential value to the motoring public.

As recent tests in Phoenix showed, the air bag has a long way to go before its performance can be judged acceptable. The Department of Transportation certainly could take no comfort from Phoenix, and DOT has been a leading air bag proponent.

They ran test vehicles into non-yielding barriers at 50 miles per hour. What happened was bad news as far the dummy occupants were concerned. In about half the cases, the dummies were not protected.

The auto companies have been claiming they need more time to develop a truly dependable air safety bag. It's all right for government to hold their feet to the fire on such things as safety features and emission standards, but time must be allowed for engineering at least a measure of failsafe into these devices.

Our own misgivings on the air bag are deep. Frankly, we'd rather see something along the lines of mandatory use of seat belts and/or shoulder harnesses than bags which blow up in a person's face. The effect this would have on an elderly person, for example, is not difficult to guess.

If success of the air bag can't be guaranteed under carefully controlled, experimental conditions such as were in effect in Phoenix, then reliable performance under everyday road conditions is seriously open to question.

Furthermore the possibility of lethal flaws is greater on an assembly line basis than in laboratory conditions. Not satisfactorily answered yet in our opinion is whether the air bag should inflate on impact or on braking.

We need to develop and enforce safety standards, but we also need to make sure they will work. The air bag has a long way to go.

[From the Detroit Free Press, Apr. 19, 1972]

AIR BAG FAILS IN SUPER-SAFETY CAR

PHOENIX, ARIZ.—The federal government's $4 million gamble in traffic safety smashed into a concrete barrier Tuesday, damaging the bumper area of the experimental auto and one of three lifelike dummies.

An air bag designed to protect the occupants failed to inflate as fast as expected.

The front half of a conventional car was damaged in a similar test earlier.

After watching from a desert testing site, U.S. Transportation Secretary John Volpe told 22 auto manuafuring representatives and several hundred others that the results of experiments could create sweeping auto design changes in the not too distant future.

The Department of Transportation hopes to produce a vehicle which will allow passengers to walk away from serious accidents with only minor injuries.

"Some manufacturers will be putting these ideas into production as soon as we find out they work. But when we determine what ideas are good and feasible we will issue Federal standards that must be met, leaving enough time for manufacturers to meet them," Volpe said.

Rambling along a groundmounted monorail at 50 miles per hour, the experimental vehicle smacked into the barrier with its three sophisticated dummies unsecured by seat belts.

An air bag failed to inflate in three-hundredths of a second as expected and the dummies were thrown into the windshield, shattering it. The dummy on the passenger side of the front seat presumably would have been seriously injured or killed.

Scientists with Dynamic Science, a testing company which conducted the tests, said the simulated accident was equal to a head-on collision between two cars at 50 miles an hour.

They said they should know within two weeks what injuries would have been suffered had the occupants been human. The dummies were equipped with sensors designed to duplicate human responses.

Except for the enlarged bumper and a periscopic mirror which protruded above the roofline, the vehicle developed by Fairchild Hiller appeared like any other four-door sedan at first glance.

But, when scientists compared the car with a conventional one—which also was crashed into the barrier at 50 miles an hour—the similarity was gone.

The front half of the conventional car, crashed before Tuesday's experiments, was wrinkled accordion style.

The bumper portion of the Fairchild car appeared somewhat damaged, but the back two-thirds was virtually unmarked. The dummy passengers were not thrown outside, since the doors remained closed.

One of the main reasons for the light damage, Dynamic Science scientists said, was the bumper, which automatically extends one foot in front of the car at speeds of 30 miles an hour or faster.

Scientists said the car had a normal V8 engine mounted in the front, and was required to have better than average braking, handling and accelerating ability.

[From the Oakland (Calif.) Tribune, May 2, 1972]

AIR BAGS DEFLATED

A major argument against the U.S. Department of Transportation's efforts to require air bags for all new cars by 1976 has concerned the reliability of these novel safety devices.

Air bag opponents have pointed out that DOT is intent on requiring they be installed before first determining through field testing and actual, practical application, that they work when needed—that on the instant of an auto's impact they would burst from the dashboard to protect occupants of a vehicle from being pitched violently forward.

Admittedly, it's difficult to get volunteers to deliberately endure a head-on collision to test if the bag will pop out in time to prevent injury. But a recent public testing in the Arizona desert by DOT of a specially built experimental safety car offered the next best thing.

Three bags were supposed to become instantly operative when the car hit a solid barrier at 50 mph. This was a much-heralded test, for if the air bag proved reliable, the DOT pressures to force their use as standard equipment on new cars would be extreme.

Instead, the bags didn't work, and the life-size dummies simulating human passengers were pretty well mangled. One broke in two.

So it's apparently back to the drawing board for the air bag designers.

Seat belts, shoulder harnesses and added padding on the dash boards are still the practical and proved devices for safeguarding auto passengers in head-on collisions.

DOT's partiality for the air bag is based on its "passive restraint" feature: No buckling in by the auto occupant is necessary.

While such concern for those who decline to use available harness and straps for their own protection is commendable, eventually there must be a limit to how far we should go to protect those who evidently don't want protection.

[From the Arizona Republic, Phoenix (Ariz.), May 14, 1972]

AUTOMAKERS FRIGHTENED—CAR AIR BAG FAILURE DEFLATES U.S. EFFORT

(By Turk Smith)

There's little doubt that the Department of Transportation struck out in its effort to force us all to drive air bag-equipped cars by 1976.

Official explanations of the recent failure of the controversial bags in a test crash here recently sounded as if they were uttered by small boys, bats and gloves in hand, trying to explain away a broken window.

"It's only one failure," a DOT man said.

Students of the problem, including manufacturers who will be forced to put the bag in their cars, knew better.

Is that what DOT will tell your family when one of those "just one failures" goes off in your car when you are speeding down the freeway at 70 miles per hour?

— Or fails to go off when some idiot crosses the center line and hits you head on?

— Of the nearly 10 million cars made in this country each year, are 10, or 20, or 30 going to be even more lethal than any of Ralph Nader's imaginings?

— Will the manufacturers, who are ordered to spend millions recalling cars for even potential defects, be ordered now to install a device that is almost sure to kill a few people?

The car makers are frankly frightened. Apart from any altruism about needless slaughter, they know that when the inevitable failure comes the manufacturer, not the bureaucracy that ordered the device, will be liable.

On paper, and in the minds of the bureaucracy, the air bag solution to highway accidents seems simple:

—Since few people use their seat belts (one of the few mandatory "safety" devices that actually saves lives), some sort of passive restraint shoud be devised to protect the car's occupants in the event of a crash.

—It seemed logical to order manufacturers to install passive restraints in all cars by 1976, even though no fall-safe device exists in fact or on paper.

Although the words air bag are not mentioned in the standard which has the effect of law, it has been clear that Secretary of Transportation John Volpe and the Department of Transportation have been convinced bags are the way to go.

A story April 30 in The New York Times repeats what insiders have known: Volpe and DOT have advocated the air bag all along, and intended to push hard for public acceptance this year.

At a debriefing after the failure of the bags in the crash here, Volpe inadvertently gave away information about DOT's preoccupation with them:

Human volunteers had survived simulated crashes at 32 miles an hour without a scratch. Extraordinary and expensive precautions had been taken for their safety in event of failure, far more exotic than would be found in any mass-produced passenger car.

Weeks before the public test crash, a similar vehicle, also with air bags, had been test crashed secretly just to make sure everything worked. The test dummies "survived."

The cars cost the taxpayer nearly $4 million apiece. Cost of the series of tests with the human volunteers was not stated.

Volpe had nothing but praise for Dynamic Science, the firm responsible for running the exotic tests of the automobiles, pointing out that the firm hadn't made a single mistake.

His praise was almost as strong for Fairchild-Hiller, which prepared the second car for testing. It was probably repairable, he said, even after the 50-mile-per-hour barrier crash.

He regarded the one failure—that of the airbags—as insignificant.

"This is not a setback," he said.

The test car was prepared with the utmost care, he said, and everything possible was redundant—that is, doubled—to back up any component malfunction.

Days later, it turned out that the redundancy probably caused the failure. When two fail-safe switches with duplicate fail-safe wiring have their wires crossed, neither will work.

The failure "killed" the dummies.

This in a car that cost millions and as prepared under laboratory conditions impossible to duplicate in the cars we'll be buying in 1976.

The switches were not the same as the sensing device that will have to be in those 1976 cars—they were better, "safer" and wired for a known emergency.

What will happen when we trust our lives to a mass-produced sensor that may be installed in your car on a Monday by a disgruntled worker with a hangover?

Will the bureaucrats shrug and say it's insignificant?

Or will the little boys lay down their baseball bats and admit they may have made a mistake?

[From the Toledo (Ohio) Blade, Apr. 29, 1972]

THE AIR BAG FIZZLE

Experts who designed the experimental safety vehicle that crashed into a steel barrier at 50 miles per hour are still trying to determine whether the dummies met the equivalent of instant death or were only slightly killed. Data fed into computers ultimately will make public their simulated fate.

But whether death would have been instant or slightly so, the abysmal failure of the air bags to function properly after the most precise preparation should deflate once and for all the loud-lunged demands of some bureaucrats, legislators, and consumer advocates that these inflatable cushions should be slashed in every new car by 1976.

That "only slightly killed" reference is not a poor joke; it is a serious automotive engineering description of what happens when a protective design is almost but not quite good enough to do the job. In this most publicly displayed test, the air bags opened too late. In an earlier barrier test, reports indicated that right front and right rear "passengers" were slightly killed by the exploding air bags.

The air cushion is not ready, is not reliable. And that has been the basis of auto makers' protests against the Department of Transportation that air bags would replace seat belts and shoulder harnesses. At this moment, those two safety restraints appear to be far and away more superior devices. Coupled with padded dashboards, collapsible steering wheels, safer windshields, and other features, they are uncomplicated and have been proved to offer greater security.

The objections from the DOT that motorists and passengers fail to use the seat belts and must be protected against their own neglect are poor arguments for forcing an industry into an expensive and unreliable substitute. Air bags, like seat belts, are supposed to last the life of a car. Given these malfunctions under extremely favorable and costly preparation, what sane motorist would trust a production-line installation not to fail—or not to inflate accidentally?

[From the St. Paul (Minn.) Dispatch, Apr. 20, 1972]

NO WAY TO PROTECT INCOMPETENT DRIVER

(By William Sumner)

The first big air-bag experiment was a flop. The three dummies used in the 50 mph crack-up at a Phoenix, Ariz., test area were presumed dead. The bag didn't inflate fast enough. This by a split second. The test vehicle survived, but I would assume that anything that cost the federal government $2 million ought to survive. That would be quite a car to buy. How could you and I arrange financing?

The whole idea of the air bag, a ballooning device that is supposed to work by sensor, just before impact, is to relieve the driver of the inconvenience of buckling seat and shoulder belts.

The money is being thrown into this thing by the U.S. Transportation Department because drivers and their passengers seem unwilling to take fairly easy precautions about fastening belts. No one is willing to say that such persons may be wanted in Heaven. Why is so much being spent, why is the auto industry being faced with such an unrealistic order and deadline (1976) when safety belts are there and waiting to be used? Why don't they put the money into developing transportation? And who wants to be snapped up by an airbag anyway?

The consumer movement has been a thing of wonder in many ways. Beginning with Nader, there has been an increased awareness, a movement away from the philosophy that the buyer ought to beware. Beware, hell, when you have wheels that might fall off or an engine that might spin out of its mount.

But as is our way, we go overboard. We want safe tires, wheels that stay on, engines that stay mounted and bumpers that can withstand minor impacts—as bumpers used to do. But there is no way on earth to protect the foolish driver, the drunk or the incompetent.

It doesn't seem reasonable that an entire population should be ordered to sit behind a balloon that might inflate on whim, or when you are about to hit your garage, or might not inflate at all when you have decided to hit someone head on.

The message, I suppose, is that humans are imperfect and machinery is imperfect and that the only way some of our citizens can be transported safely is in a vented coffin delivered by some moving company. It would be a difficult way to get to work, and my word you might have to lay there for a few hours while some clerk and a truck driver argued over bills of lading. But no one would hit you head on. You wouldn't hit anyone. You would be safe, in a bronze (or wooden or plastic) womb.

About us daily we can see the danger of letting humans drive machinery at all. We drive too fast. Or we drive too slow. Some of us hog what should be recognized as the speed or passing lane of the freeway. Some of us do this with a moral judgment, one which holds what the good Lord didn't intend that we go more than 50 mph.

Others are aggressive. They are in one lane. And then another. They feel challenged. They tailgate. They cut in. They go nuts.

And the federal government worries about large balloons which are supposed to protect us from such phenomena. It is like the old security of childhood fun and game; touching base in a game of tag; iron walls, steel doors and windows when a game became psychologically threatening.

Well, friends, it is nutty. We have gone ape. Why don't they focus on the real menace, the driver? Friends, I will tell you why: It is because he votes, and apparently someone in the federal bureaucracy has felt a wind of some kind demanding an automotive security blanket.

Here is one party who will be armed with a hatpin. If an air bag whops me I shall stick it one. A good one. Perhaps my Swiss Army Knife, a gift from my eldest daughter would be better. What kind of a knife did Tarzan have? That is what we shall need to extricate ourselves from our envelopes of rubber or plastic after we have bounced too hard into a curb. It will be 50–50 whether it will work when needed. These may be attractive odds to some.

[From the Winnipeg (Canada) Free Press, Apr. 19, 1972]

Car Safety Not in the Bag

Phoenix, Ariz.—The United States transportation department had a party here Tuesday for a safe car, but the air bag—one of the guests of honor—didn't show up.

The occasion was a crash test of an experimental safety vehicle, one of several being built for the department as test cars to demonstrate safety features automakers could build into future production cars.

The $2 million test vehicle survived a 50 m.p.h. crash into a steel barrier with barely a scratch, but the dummy occupants were apparently "killed" because three air bags designed to protect them failed to inflate.

While transportation department officials argued that it was not significant, the embarrassing failure during its own test recalled questions raised by air bag opponents over the wisdom of requiring them in future cars.

Federal standards demand that 1976 and later model autos be equipped with restraint systems that require no occupant action (such as buckling a seatbelt) but which protect passengers from injury or death in crashes of 30 m.p.h. into a barrier. Air bags are the favored approach.

In theory, the balloon-like devices would inflate within a fraction of a second of the beginning of an accident, preventing occupants from being pitched into potentially lethal interior components.

Auto-makers and other air bag critics contend it is technically unfeasible to design such a system that will always work when it is supposed to and never inflate accidentally.

Douglas Toms, head of the transportation department's national highway traffic safety administration (which sets safety standards for new cars sold in the U.S. said someone apparently failed to throw a switch during the test crash necessary to provide electrical current to the sensors which trigger the air bag system. The cause won't be known for sure until an investigation is completed.

Another department official emphasized that the experimental system was designed for requirements beyond those set for 1976 cars. Even if the problem was in the air bag system itself, he indicated, "that doesn't mean that systems being designed for 1976 production cars are affected by what happened here."

The test vehicle—one of two built for the transportation department by Fairchild Industries' Republic Division under a $4 million contract—included a bumper and frame system that absorbed much of the energy of the collision and minimized damage to other parts of the car. After slamming into the steel barrier, the car's hood was intact. By comparison, a standard production car crash at the same speed and exhibited for comparison was demolished from the trunk forward.

The Fairchild car also featured a periscope-type rear view mirror for greater visibility, and anti-skid brakes.

[From the Louisville Times, Apr. 20, 1972]

THE AIR BAG FAILURE DEFLATES SOME HOPES

The fiasco of the automobile air bags test is disconcerting—and for more than one reason.

It is disconcerning, obviously, because it is disappointing. Everyone who has the least interest in auto safety—and that should include all of us—wants the air bags to work. Anything that promises to improve a motorist's chances of survival in a crash is desirable.

But the failure of the air bags to inflate at the special test in Phoenix a couple of days ago is worrisome for other reasons also. Is too much being expected too soon? Is the government, in properly trying to improve auto safety swiftly, actually creating added dangers?

Federal regulations call for 1976 model cars to have what are known as passive restraints—that is, something to protect the auto's occupants without their having to do anything, something other than seat belts, in other words. Air bags, designed to inflate almost instantly and cushion the occupants, are the device most generally being considered.

At best, the air bags are an imperfect answer to the problem. Even when they work properly, they give no protection for second impacts, as when a car already hit is struck again by a third car, for they are supposed to deflate almost as rapidly as they are supposed to inflate. Nor do they offer much protection in case of rollover accidents.

Despite all this, if passive restraints are considered necessary, air bags seem at the present state of technology to offer the best hope.

That is why the failure of the bags the other day is so disquieting. This was not an ordinary test. It was part of an over-all safety test involving not just air bags but the structural solidity of a specially designed experimental car. Millions of dollars have gone into the project. To have what is supposed to be our best hope for passive restraints fail under such circumstances is not encouraging to those of us who want safer cars. Perhaps an investigation will show that the cause of the failure can easily be remedied. But if it is that simple, we can only wonder why it wasn't done before instead of after.

The car itself seems to have survived the test crash in reasonably good shape, which is heartening. But we should not forget that auto safety—at least within the foreseeable future—will never be just a matter of safety vehicles. If we are serious about safety we have to think harder about the people who drive cars and the quality of the roadways on which they drive them.

[From the Phoenix (Ariz.) Arizona Republic, Apr. 23, 1972]

DOUBT CAST ON AIR BAG VALUE BY ONE-IN-A-MILLION FAILURE

(By Turk Smith)

Did failure of an air bag in a test crash last week puncture its chances of becoming required equipment on automobiles?

"After all, it's only one failure," a spokesman for the Department of Transportation (DOT) said.

A Ford executive disagreed. "That's what they say when a parachute fails to open. The man never complains."

Manufacturers have insisted repeatedly that air bags are potentially dangerous for a number of reasons, chiefly in that they may go off at the wrong time—

or not go off at all. Even a one-in-a-million failure would be one too many with human lives at stake.

Department spokesmen have insisted that some sort of passive restraint be in all cars manufactured in this country after Aug. 15, 1975, and that the air bag looked the most promising.

Designers of two experimental safety cars (ESVS) built at a research and development cost of nearly $8 million, apparently thought so, too.

The two cars have been undergoing tests at the Dynamic Science facilities north of Deer Valley Airport, and both contained air bags, which are supposed to expand in case of a serious accident and catch the human occupants in a plastic cushion.

One car, built by AMF, Inc., was smashed into a barrier Mar. 31 at a speed of 50 miles per hour. The car withstood the impact, the air bags went off and caught the three dummies and presumably saved their lives.

Tuesday, an automobile built by Fairchild-Hiller was crashed under identical conditions, the car survived but the air bags failed. The dummies presumably died."

"That was only one facet of the vehicle," said Secretary of Transportation John Volpe at a debriefing after the test. "This is not a setback. We have tested air bags up to 30 miles per hour (in crashes) with human volunteers—this is not to say air bags are not capable of doing the job—we're not telling the manufacturers what to do—just to comply with 10 standards."

Volpe said that nowhere in the proposed standards could the words "air bag" be found. "After Aug. 15, 1975, all cars manufactured in this country will have to be equipped with passive restraints that will do certain things, he said, but the air bag was not mentioned.

Fairchild-Hiller officials were glum. "We're obviously unhappy about all this," said Carl Roberts, manager of the Fairchild-Hiller program. "But it doesn't fall into the category of basic structural design."

William Wait, test manager for the firm, said that the whole air bag system in the experimental car was "redundant" that is, there were two controls and switches for everything—if one failed the other was supposed to work.

Asked if the failure, where everything was redundant and prepared under lab conditions, might affect thinking about installation in passenger cars, where they would be massed produced and dependent on single sensing devices, Roberts said he didn't think so.

"It was just a random failure," he said.

Doug Tomis, director of the National Highway Safety Bureau of the Department of Transportation, said that failure of the air bags was not too significant.

"I think that the test was an admirable attempt to manage energy. There wasn't any requirement for air bags in these cars. Any manufacturer that can match our requirements doesn't have to have an air bag—the 1976 standards call for passive restraint."

"After all, we are interested in the integrity of the structure, handling, a lot of things."

John Edwards, an assistant to Toms, was more direct. "After all, it's only one failure," he said.

Questioned later, Harold Bryslinger, product planning executive for Ford and an observer at the tests (Ford and General Motors building their own ESV), said that both the AMF and Fairchild-Hiller cars had performed very well, and didn't blame the maker for failure of the air bags.

But forcing them on the manufacturer of passenger cars was another matter, he said.

He cited the possibility of parachute failure. "If one in a million fails to open," he said. "We've lost someone who won't ever complain."

[From the San Antonio (Tex.) News, Apr. 20, 1972]

MALFUNCTION OF AIR BAG REVEALS BASIC PROBLEMS

Much more work needs to be done before air bags can become standard auto safety equipment.

The air bags in an experimental car failed to inflate when the test vehicle was smashed into a concrete wall at 50 mph. The dummy occupants were thrown into the windshield. The test car survived the crash better than a standard auto, but the "occupants" did not.

Failure of the air bags to inflate is only one problem. They also could inflate when they are not needed. A glancing blow could trigger them, giving the driver a face-full of bags as he tries to control the car. More work is needed.

[From the Westerly (R.I.) Sun, Apr. 26, 1972]

HARDING DOUBTS RELIABILITY OF AUTO AIR BAG

Ellsworth S. Harding, executive vice president of the Automobile Club of Rhode Island said today that the recent failure of three air bags to inflate during a test of Fairchild Industries' experimental safety car this week once again amply demonstrated the dubious reliability of the device.

Mr. Harding said that the test in Arizona, in which the car survived but the dummy occupants "died," validated AAA's opposition to premature installation of the air bag on all passenger cars. Passive restraints such as air bags will be required in all 1976 model cars as Federal regulations now stand.

"The government has assured everyone that the air bag was reliable and ready for installation," he said. "Now, after allocating almost $9 million to produce prototype safety cars, the air bags failed in one of two demonstration vehicles. If after spending all that money, air bags still cannot be made to function under ideal test conditions, how can the motoring public be expected to believe that the reliability of 40 million mass-produced air bags installed in 10 million mass-produced cars annually be any better?"

AAA has opposed premature installation of the air bag on the grounds that it has not had sufficient "real world" testing AAA again called for extensive use of air bags on government and other fleet vehicles before forcing them on the motorist.

"The government has an obligation to be sure that when the public must spend billions for safety devices, those devices actually work," Mr. Harding said. "Clearly, if the air bag fails in test situations where all conditions are carefully controlled, it cannot be as fail-safe as government propaganda would have us believe."

[From the Chicago Sun-Times, Apr. 19, 1972]

BUMPER, AIR BAGS FAIL—U.S. TRAFFIC SAFETY TEST NOT A SMASHING SUCCESS

(By Bill Roberts)

PHOENIX, ARIZ.—The federal government's $4-million gamble in traffic safety smashed into a concrete barrier Tuesday, visibly damaging the bumper area of the experimental auto and one of three lifelike dummies. An air bag designed to protect the occupants failed to inflate as fast as expected.

The front half of a conventional car was wrinkled accordion style in a similar test earlier.

After watching from a desert testing site, U.S. Transportation Sec. John A. Volpe told 22 auto manufacturing representatives and several hundred others that the results of experiments could create sweeping auto design changes.

The Transportation Department hopes to produce a vehicle that will allow passengers to walk away from serious accidents with only minor injuries. "Some manufacturers will be putting these ideas into production as soon as we find out they work," Volpe said.

VEHICLE RUNS ON MONORAIL

Rambling along a ground-mounted monorail at 50 m.p.h., the experimental vehicle smacked into the barrier with its three lifelike dummies unsecured by seat belts.

An air bag failed to inflate in three-hundreds of a second as expected. The dummies were thrown into the windshield, shattering it. The dummy on the passenger side of the front seat presumably would have been killed or seriously injured.

Sol Davis, chief of systems engineering for Fairchild-Hiller, developers of the auto, said an investigation would be conducted to determine why the air bags failed.

The air bags, he said, were the key to keeping passengers not using seat belts from being injured. The federal government would not allow seat belts to be used on the dummies during the tests.

EQUAL TO HEAD-ON CRASH

Scientists with Dynamic Science, the company that conducted the tests, said they should know within two weeks what injuries would have been suffered had the occupants been human. The dummies were equipped with sensors designed to duplicate human responses.

Except for the enlarged bumper and a periscopic mirror which protruded above the roofline, the vehicle developed by Fairchild-Hiller appeared like any other four-door sedan.

But when scientists compared the car with a conventional one—which also was crashed into the barrier at 50 m.p.h.—the similarity was gone. The front half of the conventional car, crashed before Tuesday's experiments, was wrinkled into the passenger compartment. The bumper portion of the Fairchild car appeared somewhat damaged and the back two-thirds was virtually unmarked.

One of the main reasons for the light damage, Dynamic Science scientists said, was the bumper which automatically extends one foot in front of the car at speeds 30 m.p.h. or faster.

[From the Pontiac (Mich.) Oakland Press, May 8, 1972]

THE AUTOMOTIVE REPORT: FORD CO. SAYS BABOONS BADLY HURT IN AIR BAG CRASH TESTS

(By Joseph M. Callahan)

The National Safety Administration and other supporters of the inflatable air bag strongly feel that the air bag is much superior to seat belts in high speed collisions.

But attorneys for Ford Motor Co. at the air-bag hearing in the U.S. Court of Appeals in Cincinnati recently declared that high-speed tests at Holloman Air Force Base with baboons were far less successful in demonstrating the effectiveness of the air bag than the Safety Administration has made out.

In these tests, eight baboons were subjected to simulated auto crashes of over 30 miles an hour and air cushions were used for protection.

Ford's attorneys declared that the government's assertion that baboons tested with air bags experienced only minor bruises is simply untrue. Of the eight animals subjected to air bag deployment, one was found dead in its cage on the day following the test; another had a fractured jaw and ribs, brain and spinal cord hemorrhaging, abdominal hemorrhaging and lacerated tongue and cheek. And each of the other animals sustained clinically discernible injury."

No cause of death was discovered for the test baboon that died in his cage the day following the impact, although there was a aneurysm of the aorta and lung hemorrhages.

To get additional information from the test, the researches sacrificed the seven surviving baboons and conducted extensive post-mortems on the bodies. Among the injuries discovered on these animals were a ruptured kidney and liver, a hemorrhage in the lungs and legs, abrasions on both arms, additional rib fractures, spinal cord hemorrhages and hemorrhages in coronary arteries.

Of course, it should be mentioned at this point that these highspeed crashes probably would have killed or badly injured all or several of these baboons also. The point the lawyers apparently were making was that inflatable air bags are not 100 per cent guaranteed to prevent all injuries and deaths.

However, the Ford people said, "These tests were conducted under conditions grossly slanted to place air bags in a favorable light. Among other things, the air bags and the space available for their deployment were far larger in relation to the size of the baboon subjects than would be the case with air bags restraining adult humans in producvtion vehicles; and with respect to the harness systems used, the scaling was in just the opposite direction, using webbing of half the width and much lower elasticity than that employed in normal automotive safety harnesses."

[From the Raleigh (N.C.) Carolinian, May 6, 1972]

AUTO AIR BAGS FAIL AGAIN

We have heard a lot about the use of air bags in automobiles to increase the safety of passengers.

The public has been suspicious of air bags, since earlier tests have flopped and yielded poor results. Sometimes the bags do not open at all.

In a recent test the Secretary of Transportation, John Volpe, has been convinced that he could cram this unreliable device down the public's throat, regardless of whether the public wants it or not.

Tests with dummies on the passenger side of the front seat indicate that a human passenger would have been seriously injured with air bag failures. Proponents of air bags claim that these devices will save lives because people forget to buckle seat belts. No one should be forced to use air bags if he chooses not to employ them.

We are assuming as American leaders that air bags will save human lives. The test with the automobile dummy is one thing but we can't afford to make "dead dummies" of United States citizens.

More important than seat belts or airbags, is the man behind the steering wheel. He spells the safety difference on any highway.

[From the Washington (D.C.) Evening Star, Apr. 28, 1972]

THE BEST THING

(By Robert W. Irvin)

The failure of some air safety bags to go off in an automobile crash test may have embarrassed the federal government which sponsored the experiment in Phoenix, Ariz., last week but may have been a blessing in disguise for the auto industry and the public.

One who subscribes to this view is Alan G. Loofbourrow, vice-president for engineering at Chrysler Corp.

He said the fact that the air bags turned up duds may have been "the best thing that could have happened to the American drivers."

The auto companies have opposed federal efforts to put air bags on all cars, claiming more development work is needed before they can become standard equipment.

Loofbourrow said in view of the air bag failures in one of their own cars, the federal officials might now begin "to accept some of our questions" and agree that more research and development work needs to be done.

The Chrysler executive noted that the federal officials crashed one car earlier and that the air bags inflated in it, giving them a 1–1 record.

"I'd hate to think of only half our brakes working," he said.

He indicated Chrysler has its own approach to the air bags.

"We think there may be other ways of applying an inflatable restraint to cars than the ways made public up to now," he said, but did not elaborate.

Loofbourrow said Chrysler has some plans for fleet testing of its air bag but that this wouldn't be done this year and not until some current development work on the new designs are completed.

The executive also indicated Chrysler might soon become the third U.S. auto firm to obtain a license for manufacturing the Wankel rotary engine.

He said if the decision is to obtain a license he expected it would come in a matter of months—"relatively imminently."

Loofbourrow said Chrysler had bought three Japanese-built Mazda cars, which have the rotary engine, and said the company is running one engine on a laboratory test stand.

He noted there is a fuel penalty with the engine of about 25 percent and suggested the future of the Wankel will "be strongly influenced" by decisions the Environmental Protection Agency (EPA) makes on 1975–76 emission requirements.

If the EPA relaxes or otherwise changes the rules so conventional engines can meet them without need for expensive hardware like a catalytic converter or a thermal reactor then this hurts the outlook for the Wankel, he said. He explained this is because the Wankel now requires such equipment just to meet the current standards.

He made it plain Chrysler, like Ford, is getting involved with the Wankel to stay competitive with General Motors. GM was the first U.S. firm to obtain a license on the German engine and has an intensive program which some say will lead to GM rotary engine cars by the mid-1970's.

[From the Edmonton (Canada) Journal, Apr. 19, 1972]

AIR BAG TOO SLOW IN $4 MILLION CRASH

PHOENIX, ARIZ.—The United States government's $4-million gamble in traffic safety smashed into a concrete barrier Tuesday, damaging the bumper area of the experimental auto and one of three lifelike dummies.

An air bag failed to inflate in three-hundredths of a second as expected and the dummies were thrown into the windshield, shattering it. The dummy on the passenger side of the front seat presumably would have been seriously injured or killed.

The front half of a conventional car was wrinkled accordian style in a similar test earlier.

After watching from a desert testing site, Transportation Secretary John Volpe told 22 auto-manufacturing representatives and several hundred others that the results of experiments could create sweeping auto design changes in the not too distant future.

The department of transportation hopes to produce a vehicle which will allow passengers to walk away from serious accidents with only minor injuries.

Rambling along a ground-mounted monorail at 50 miles an hour, the experimental vehicle smacked into the barrier with its three sophisticated dummies unsecured by seat belts.

Scientists with Dynamic Science, a testing company which conducted the tests, said the simulated accident was equal to a head-on collision between two cars at 50 m.p.h.

[From the Los Angeles Times, Apr. 19, 1972]

AIR BAGS FAIL TO FUNCTION IN TEST OF PROTOTYPE SAFETY CAR—$2 MILLION VEHICLE BUILT FOR TRANSPORTATION DEPARTMENT UNDAMAGED IN 50-MILE-PER-HOUR CRASH, DUMMIES ARE "KILLED"

(By Dan Fisher)

PHOENIX.—The U.S. Transportation Department had a party here Tuesday for a safe car, but the air bag—one of the guests of honor—did not show up.

The occasion was a crash test of an experimental safety vehicle, one of several being built for the department as test beds to demonstrate safety features auto makers could build into future cars.

The $2 million test vehicle survived a 50 m.p.h. crash into a steel barrier with barely a scratch, but the dummy occupants apparently were "killed" because three air bags designed to protect them failed to inflate.

While Transportation Department officials argued that it was not significant, the embarrassing failure during its own test recalled questions raised by air bag opponents challenging the wisdom of requiring them in future cars.

CRASHES AT 30 MILES PER HOUR

Proposed federal standards demand that 1976 and later model autos be equipped with restraint systems that require no occupant action (such as buckling a seatbelt) but which protect passengers from injury or death in 30 m.p.h. crashes into barriers. Air bags are the favored approach.

In theory, the balloon-like devices would inflate within a fraction of a second at the instant of a collision, preventing occupants from being pitched violent into the steering wheel, windshield or dashboard.

Auto makers and other air bag critics say it is technically unfeasible to design such a system that will always work when it is supposed to and never inflate accidentally.

Douglas Toms, head of the Transportation Department's National Highway Traffic Safety Administration (which sets safety standards for new cars sold here), said someone apparently failed to throw a switch, necessary to provide electrical current to the sensors which trigger the air bag system. The exact cause will not be known until an investigation is completed.

EFFECT ON 1976 CARS

Another department official emphasized that the experimental system was designed for requirements beyond those set for 1976 cars. Even if the problem proves to be in the air bag system itself, he indicated, "that doesn't mean that systems being designed for 1976 production cars are affected by what happened here."

Some who oppose air bags hope that—added to previous controversy—Tuesday's test will undermine the government standard. One small group, representing an association of auto importers, cheered when Transportation Secretary John Volpe announced minutes after the crash that the air bags had failed.

Other features, meanwhile, impressed the approximately 250 state and federal government officials and auto industry representatives attending the crash test.

The vehicle—one of two built for the Transportation Department by Fairchild Industries' Republic Division, under a $4 million contract—included a bumper and frame system that aborted much of the energy of the collision and minimized damage to other parts of the car.

After slamming into the steel barrier, the car's hood was opened routinely. By comparison, a standard production car, crashed at the same speed and exhibited for comparison, was demolished all the way back to the trunk.

The Fairchild car also featured a periscope-type rearview mirror for greater visibility plus antiskid brakes.

The experimental safety vehicle program is aimed at demonstrated cars capable of withstanding 50 m.p.h. collisions without serious injury to occupants.

"Our ultimate goal is that many of the design solutions developed by this program will appear in production cars," Volpe said.

In addition to Fairchild, American Machine & Foundry Co., Inc. has built two safety cars under the 18-month-old program.

The Transportation Department will compare test results on cars from both firms, then award a contract to one to build several more test vehicles for further study. It is unknown what effect the failure of the air bags in Fairchild's car will have on that competition.

[From the Schenectady Gazette, Mar. 23, 1972]

EXPLOSIVE AIR BAGS IN AUTOS

Sen. Marlow W. Cook, Kentucky Republican, said it was "incredible" and "appalling" that the National Highway Traffic Safety Administration has ruled that when all cars are equipped, starting in 1976, with air bags that blow up in your face, the auto makers can dispense with seat belts. The NHTSA said the air bags will be so efficient that the seat belts will be largely "redundant."

We're well aware that there are people who will have nothing to do with seat belts, and when the 1973 model cars come out with the mandatory interlock belts that prevent the car from being started unless the seat belts are buckled, those defiant motorists will no doubt find a way to outwit the system. But those determined souls are not likely to welcome the explosive air bags any more than the people who have become so accustomed to a seat belt that they feel naked without it. It's hard to imagine any thoughtful motorist not being constantly apprehensive about an air bag that might blow up when it wasn't supposed to, or might fail to go off when it was expected to. We hope that our apprehensions are unwarranted, but we'll just have to wait to see. Happy motoring!

[From the Detroit News, Apr. 20, 1972]

AIR BAG TEST FAILURE MAY BE PUBLIC BLESSING

(By Robert W. Irvin)

The failure of some air safety bags to go off in experimental car crash tests may have embarrassed the federal government which sponsored the experiment but also may have been a blessing in disguise for the auto industry and the public.

One who subscribes to this view is Alan G. Loofbourrow, vice-president for engineering at Chrysler Corp.

He said the fact that the air bags were duds may have been "the best thing that could have happened to the American drivers."

The auto companies have opposed federal efforts to put air bags on all cars, claiming more development work is needed before they can become standard equipment.

Loofbourrow said that in view of the air bag failure in the experimental car, federal officials might now begin "to accept some of our questions" and agree that more research and development work needs to be done.

The air bags failed to go off Tuesday in a crash test at Phoenix of an experimental vehicle built by Fairchild Industries for the Department of Transportation.

While the car survived a crash of nearly 50 miles an hour into a steel barrier with barely a scratch, dummy occupants inside the vehicle would have been "killed" because the bags did not inflate to protect them.

Loofbourrow noted when the federal officials crashed another experimental car earlier, the air bags inflated in it, giving them a 1–1 record.

"I'd hate to think of only half our brakes working," he said.

He indicated Chrysler has its own approach to the air bag.

"We think there may be other ways of applying an inflatable restraint to cars than the ways made public up to now," he said, but did not elaborate.

Loofbourrow said Chrysler has some plans for fleet testing its air bags, but his program will not be carried out until some current development work on the new designs are completed.

On another matter, the executive indicated Chrysler might soon become the third U.S. auto firm to obtain a license for manufacturing the Wankel rotary engine.

He said the decision to obtain a license would come in a matter of months—"relatively imminently."

Loofbourrow said Chrysler has bought three Japanese-built Mazda cars, which have the Wankel rotory engine, and said the company is running one engine on a laboratory test stand.

He noted there is a fuel penalty with the engine of about 25 percent and suggested the future of the Wankel will "be strongly influenced" by decisions which the Environmental Protection Agency (EPA) makes on 1975–76 emission requirements.

Loofbourrow said the Wankel may be out if the EPA relaxes or changes the rules so conventional engines can meet them without requiring expensive hardware like a catalytic converter or a thermal reactor. He said the Wankel now requires such equipment just to meet current standards.

He made it plain that Chrysler, like Ford, is becoming involved with the Wankel to stay competitive with General Motors. GM, the first U.S. firm to obtain a license on the German engine, has an intensive program which some say will lead to GM rotary engine cars by the mid-1970's.

The indications are that Chrysler would like to obtain a royalty-free agreement. This is the type worked out by GM, which could pay up to $50 million over five years for licenses to work on the Wankel but after that would have unlimited rights to make the engine for autos Loofbourrow made his comments in an interview yesterday after Chrysler President John J. Riccardo said the auto maker is giving "very serious consideration to see if a licensing agreement ought to be worked out."

[From the Philadelphia Inquirer, May 24, 1972]

"LIFESAVING" AIRBAGS FIZZLE IN TEST: DUMMY DRIVER RAMS INTO WINDSHIELD

DETROIT.—A demonstration designed to show the life-saving potential of air bags in automobile crashes fizzled Tuesday.

The airbag failed to fire.

A dummy driver riding in the test vehicle pitched violently into the windshield as the vehicle hit a barrier at 30 miles per hour.

The demonstration was a joint venture of the National Motor Vehicle Safety Advisory Council, Wayne State University and Allstate Insurance Companies.

Larry Patrick, director of Wayne State's Biomechanical Laboratories, said he was unable immediately to determine whether the failure was in the wiring mechanism of the test vehicle or in the bag itself. But he said he suspected the former.

Airbags or some other passive restraint system have been ordered built into 1976 model cars by the U.S. Department of Transportation. In an airbag system, a sensing device explodes air-filled bags from under the dashboard to cushion momentarily, then deflate in event of a crash.

Judson Branch, chairman of the advisory council, said in a news release distributed at the demonstration that "the airbag makes crash survivability a present-day possibility," and that what is now needed "is a series of public tests under actual driving conditions."

The council news release said that "consumer confidence in the airbag is of critical importance to its acceptance."

Branch left the demonstration laboratory immediately after the failure.

Donald L. Shaffer, an Allstate vice president, said: "The airbag is ready and installation in front seat positions is essential at the earliest possible date."

[From the Wall Street Journal, Apr. 19, 1972]

AIR BAG FAILS IN TEST, THREE DUMMIES THROWN INTO CAR WINDSHIELD—A PASSENGER IN RIGHT FRONT SEAT WOULD HAVE BEEN BADLY INJURED OR KILLED IN 50-MILE-PER-HOUR SMASHUP

PHOENIX.—The government's experimental safety car, smashing into a concrete barrier in a 50-mile-an-hour test, damaged its bumper area and one of three lifelike dummies inside.

An air bag designed to protect the occupants failed to inflate in the expected three-hundredths of a second, and the dummies, unsecured by seat belts, were thrown into the windshield, shattering it. The dummy on the passenger side of the front seat presumably would have been seriously injured or killed.

Spokesmen for Dynamic Science, a testing company that was conducting the experiments, said they should know within two weeks what injuries would have been suffered had the occupants been human. The dummies are equipped with sensors designed to duplicate human responses. The car was smashed into the barrier on a ground-mounted monorail.

After watching the testing, Transportation Secretary John Volpe told 22 auto manufacturing representatives and several hundred others that the results of experiments could create sweeping auto design changes in the not-too-distant future. The department hopes to produce a vehicle that will allow passengers to walk away from serious accidents with only minor injuries.

"Some manufacturers will be putting these ideas into production as soon as we find out they work" said Mr. Volpe. "But when we determine what ideas are good and feasible we will issue federal standards that must be met, leaving enough time for manufacturers to meet them."

[From the New York Times, Apr. 30, 1972]

THE TRAVELER'S WORLD: SMASHUPS WITHOUT FATALITIES

(By Paul J. C. Friedlander)

Out on the desert near Phoenix, Ariz., the other day, an automobile crashed head on into an immovable barrier wall at 50 miles an hour, and while the car was wrecked, no one was hurt except three dummies of the United States Department of Transportation. They appeared to survive the crash exceedingly well, not only because they were made of plastic and odd sorts of stuffing and flexible joints, but mainly because they were riding in a Fairchild Republic Experimental Safety Vehicle designed for the department in its $7.8-million pursuit—with taxpayer's money—of a passenger car that will crash into a tree or bridge abutment at 50 miles an hour without killing its unbelted and unharnessed passengers.

It will take a couple of weeks of running the crash data through computers to determine whether the dummies escaped with the equivalent of a first-class Excedrin headache and some aches and black-and-blue bruises, whether they might have walked away alive if they had not been seriously injured, instantly killed beyond repair or only slightly killed. The latter is not a joke—it is a

serious definition devised by very serious automotive engineers immersed in designing crash-proof cars to describe what happens when their protective designs are almost but not quite good enough to do the job.

EXPLODING AIR BAGS

For example, nearly a month before the recent crash of the Fairchild Republic Experimental Safety Vehicle, an ESV built by AMF Corporation was put through the same barrier test. Incomplete reports on that crash indicate the right front and right rear passengers were slightly killed by the exploding air bags. The air bag is a safety device so highly thought of by Department of Transportation officials that American motorists are seriously advised to beware lest it be jammed down their throats, almost literally, by D.O.T. bureau chiefs, hysterical legislators and so-called consumer advocates. The stakes are high in the effort to save the lives of some of the 50,000 Americans killed in automobile accidents every year, and some emotionalism is understandable but not pardonable.

AMF and Fairchild Republic are competing for the contract to build a dozen additional ESV's for the department, the prize to be awarded this summer. Meanwhile, General Motors has built a half-dozen ESV's, smashed four of them in barrier tests and is delivering the remaining two to the D.O.T. by July 1. G.M. is getting $1 for its safety car work, reliably valued at more than a millon dollars worth of GM talent, effort and automoble parts. Ford Motor Company is also getting $1 for its ESV's which will not be delivered to Washington until December.

No one but the extreme lunatic fringe consumer advocates believe that these ESV's will ever be translated bodily into production automobiles. They will serve as mock-ups and demonstration models of safety ideas that may be adapted individually to production cars.

A likely candidate is the periscope rearview mirror. The ESV's have low, wide periscopes flattened across their roofs and when the driver looks into his rear-view mirror he gets a broad view of the road behind him, including the driving lanes and the shoulders. The driver's mirror needs better positioning—the one I tried required the driver to take his eyes off the road too long in getting from straight ahead to the mirror and back again. This is the kind of information designers can obtain only by putting their ideas into cars and road testing them.

NOT FOR THE PUBLIC

G.M. showed its safety car at the recent International Automobile Show in New York and I had the opportunity to ride in its front seat and sit for a few constricted moments in its rear seat, and I agree heartily with G.M. engineers that this is not a car to try to sell the public.

Without offense to the G.M. designers and engineers who worked on their ESV, you wouldn't give or sell this car in its present state to your worst enemy. This is due to the fallacy in the D.O.T.'s original requirement that the vehicles protect the passenger in spite of himself.

Disturbed by the fact that most motorists in this country do not use seat-belts and harnesses, the D.O.T. demanded complete passive protection. This means the passenger need not use a belt—the ESV's are not permitted to carry seatbelts fore or aft. All the passenger has to do is to climb into the car and sit down, and the car is supposed to take him into and through the 50-mile-an-hour crash and let him walk away therefrom.

The surest approach is to beef up the egg-crate the passenger rides in (all the ESV's do that), bracing the sheet-metal roofs with rollover bars, strengthening the doors and body sides and the chassis, all fairly simple engineering problems. Next step is to attack rapid deceleration which is what injures and kills people—the car smashes into something and the passengers fly through the air against the doors, windows, projecting instruments, through windshields, out onto the pavement. Seatbelts and harnesses keep passengers from flying about, anchor them to the vehicle so they then will decelerate their forward motion at the same rate as the vehicle. The problem then is how to slow down deceleration of the passenger compartment.

G.M. extended the nose of its car far beyond the engine and chassis, using plastics and rubber-like coverings and a lot of sheet metal (which the engineers insist on calling tin) behind a collapsible bumper.

The theory is that when the car hits an obstruction, the bumper and front end ahead of the engine (which does not give an inch) crumple and crunch up, absorb-

ing the energy of the impact, taking up the quick deceleration before all that energy or force hits the body of the car. The car may be badly damaged, even totally wrecked, but if the front end absorbs the decelerating force sufficiently and fast enough, the passengers live. The G.M. rear bumper also sticks out in back a bit, is designed also to crumple on demand.

To pin the passengers to the car interior, G.M. built what its people call a safety credenza out from the top rear of the front seat. It curves thrice to fit tightly to the chests of each of the three rear-seat passengers like a large, plastic-covered, well-padded, three-man, strapless brassiere, and it made this passenger applaud, temporarily and sympathetically, the contemporary mode of bralessness. To get into the rear seat, you suck in your stomach, slide with difficulty behind this resilient barricade and when the well-padded door is closed none of the rear-seat passengers can move, cross legs or even ankles. The poor guy in the middle straddles the drive-shaft hump in the floor and cannot move his feet anywhere.

According to G.M. crash tests, the credenza holds the passengers in the strict passive restraint that the D.O.T. requested. It also guarantees the discomfort of a straitjacket, and claustrophobia. Trapped is the only word for it. I would rather take my chances with a seatbelt and harness. I cannot imagine riding back there for more than five minutes, so what might happen on a long day's drive, especially with children?

The heavy padding around the G.M. car's front seat is comfortable and snug but the windows do not open (so passengers will not tumble out). Only a small oval opening about six inches high, 10 inches wide, slides down into the door so you can reach for a toll ticket, sign a gasoline credit card, flick a long cigar ash. But without air conditioning, you won't drive far in this car.

BLIND SPOTS

Immovable front windows made it possible to eliminate the blind spots caused by windshield-window pillars, replaced by thin strips of bright metal. The roof is cantilevered forward for the strength lost in removing the pillars, and without them visibility forward and to the sides is tremendously improved. This and the lowered sloping hood for a clearer view of pavement directly ahead are probably the best features for the driver in this ESV.

A fellow-observer questioned cynically whether G.M., in following D.O.T. directions to the letter, had not attempted to "overkill" the idea of a safety car. I am inclined to disagree, although convinced that Detroit's engineers were not overly unhappy when some favorite D.O.T. ideas proved unworkable in practice. But this seems to be more the natural view of experienced professionals toward overly imaginative late-starting amateurs.

Example: Detroit has energy-absorbing seatbelts which could not be put into the ESV because D.O.T. is insisting on airbags and may, according to some reports from Washington, soon be undertaking a massive promotional campaign in their behalf. How some of the airbags did not work in the Fairchild Republic car crash—and how aeronautical design techniques did—will be discussed next Sunday.

[From the Detroit News, Apr. 23, 1972]

AIR BAG TEST PUNCTURED

(By Bob Irvin)

When it comes to putting air bags in cars, some people won't put their money where their mouths are.

At least it looks like that judging from the response so far to the announcement by Ford Motor Co. that it was going to equip 1,000 of its 1972 model Mercury Montereys with air bags and would supply them to fleet users for tests.

These are fleet users with a stake in improving auto safety—such as insurance companies, police departments and state and federal governments.

The fleets aren't exactly standing in line waiting to get those cars. The only auto insurer which is now testing the system is Allstate Insurance Co., the Sears subsidiary.

The head of Allstate, Judston Branch, who has committed the company to the program, is chairman of the National Motor Vehicle Safety Advisory Council and is a long-time supporter of air bags.

Ford now has supplied Allstate with 200 Mercurys equipped with air bags for the right front seat passenger, at a price of $105 above the normal cost of the cars. The $105 only partly covers the cost of the bags, which are still experimental and expensive to build.

Liberty Mutual Insurance Co., the Boston firm with a record for promoting safety car projects, offered to buy one of the cars. But Ford turned down the company on grounds that the minimum number of cars for a meaningful fleet test should be 20.

The federal government, which has the largest fleet, has yet to purchase a car.

There is a statutory limit of $1,800 that the government is allowed to spend for cars. However, it is thought the Department of Transportation could find the money because these are experimental vehicles and there is a budget for that sort of thing.

Ford safety officials are getting worried because they are running out of time on the 1972 model. They are afraid that unless they get some orders quickly they will not be able to test more than one-half of the 1,000 cars they have been authorized by management to build.

Eaton Corp., one of the two main suppliers for air bags, has agreed to take 85 cars. Allied Chemical Corp., the other supplier, has ordered six thus far, but Ford officials expect that to climb to 100.

Ford is going to put 100 into service in its own fleet. Of these 59 have already been built, and 20 have been assigned to company officials. The other 39 will be assigned within a week.

Webster C. McDonald, assistant director of safety programs at Ford, admitted he is "disappointed" at the response from the fleets with the notable exception of Allstate. He said that while there has been a lot of talk about testing air bags, Allstate was the only firm outside of the two air bag suppliers to agree to try the system.

McDonald admits one drawback to testing has been the legal rules which must be met. There are signs on the instrument panel and the facing of the air bag container alerting drivers that the bags are in the cars. There is also a booklet which warns those with hearing problems about noise when the bags inflate. Then there is the fact the government's own test failed recently.

[From the Arizona Daily Star, Apr. 19, 1972]

Safety Auto Damaged in Test Crash

one dummy 'dies' as air bag fails

(By Bill Roberts)

Phoenix (AP).—The federal government's $4-million gamble in traffic safety smashed into a concrete barrier Tuesday, visibly damaging the bumper area of the experimental auto and one of three lifelike dummies.

An air bag designed to protect the occupants failed to inflate as fast as expected.

After watching from a desert testing site, U.S. Transportation Secretary John Volpe told 22 auto manufacturing representatives and several hundred others that the results of experiments could create sweeping auto design changes in the not too distant future.

The Department of Transportation hopes to produce a vehicle which will allow passengers to walk away from serious accidents with only minor injuries.

"Some manufacturers will be putting those ideas into production as soon as we find out they work. But when we determine what ideas are good and feasible we will issue federal standards that must be met, leaving enough time for manufacturers to meet them," Volpe said.

Rambling along a ground-mounted monorail at 50 miles an hour, the experimental vehicle smacked into the barrier with its three sophisticated dummies unsecured by seat belts.

An air bag failed to inflate in three-hundreds of a second as expected and the dummies were thrown into the windshield, shattering it. The dummy on the passenger side of the front seat presumably would have been seriously injured or killed.

Scientists with Dynamic Science, a testing company which conducted the tests, said the simulated accident was equal to a head on collision between two cars at 50 miles an hour.

They said they should know within two weeks what injuries would have been suffered had the occupants been human. The dummies were equipped with sensors designed to duplicate human responses.

Except for the enlarged bumper and a periscopic mirror which protruded above the roofline, the vehicle developed by Fairchild Hiller looked at first glance like any other four-door sedan.

But, when scientists compared the car with a conventional one—which also was crashed into the barrier at 50 miles an hour—the similarity was gone. The front half of the conventional car, crashed before Tuesday's experiments, was wrinkled accordion style into the passenger compartment.

The bumper portion of the Fairchild car appeared somewhat damaged, but the back two-thirds was virtually unmarked. The dummy passengers were not thrown outside, since the doors remained closed.

One of the main reasons for the light damage, Dynamic Science scientists said, was the bumper which automatically extends one foot in front of the car at speeds of 30 miles an hour or faster.

Scientists said the car had a normal V8 engine mounted in the front, and was required to have better than average braking, handling and accelerating ability.

The car, off-white with touches of blue and red, also could meet federal emission control standards of 1973.

Volpe said the experiments are conducted because death and injury by auto is "reaching epidemic proportions around the industrialized world.

"Here in the United States alone, more than 55,000 persons were killed and an estimated 3.8 million more were injured last year in auto crashes," he said.

"These experimental safety vehicle prototypes are being designed to help put an end to those statistics. However, I do not think it is stretching the cause to call this concept a revolutionary rather than an evolutionary one."

[From Automotive News, Mar. 20, 1972]

White House Auto Report Says Makers Are Right

(By Helen Kahn)

Washington.—A White House report on the cumulative effects of regulation of auto transportation gives such strong support to the industry's viewpoint that it casts an entirely new light on industry-government relations.

It may involve a change in the Clean Air Law.

Put together by the Office of Science and Technology, the report covers safety, emission control, highways and drunk driving.

While it takes a few cracks at the auto industry, it strongly backs the makers in their position on air bags and emissions.

And it says the government might have done more to promote the cause of safety by attacking the problems of inferior roads and drunk drivers.

Its statements on emission control suggest a need to change the Clean Air Law to permit higher nitrogen oxide emissions in 1976 and its statements on the costs and benefits of air bags vs. ignition interlock belts with use mandated by local law would appear to indicate the auto companies will win their case against the government in Cincinnati.

Environmental Protection Agency chief William D. Ruckelshaus, who has to decide before May 12 whether to grant Volvo a one-year extension to meet the 1975 standards, will undoubtedly be influenced by remarks on the need for leadtime.

And the domestic car companies—coming up for a grilling before the Senate Public Works subcommittee March 28—will be relieved to have the study backing them on their position that air pollution is a regional, albeit widespread problem, possibly involving a "two-car" strategy, and that standards mandated by law for vehicles appear to have no relationship to health needs.

The Report of the Ad Hoc Committee on Regulatory Effects on the Costs of Automotive Transportation (called RECAT) was headed by Dr. Lawrence A. Goldmuntz. It had input from EPA, the Transportation Department, the Council of Economic Advisers, the Justice Department and from the Naval Research Laboratory.

On the subject of air bags, the report said "the air-bag cost is substantially higher and the predicted benefit is no greater than the corresponding cost and

benefit of the well-known, time-tested three-point belt harness system, assuming high utilization."

It suggested the possibility of making wearing of belts mandatory through local ordinance and said such a step in Victoria, Australia, increased usage rate of belts to 75 percent.

"The potential benefit of the air-bag system, using the optimistic predictions of the Department of Transportation, is less than the potential benefit, as established by experimental evidence, of 100 percent usage of the three-point harness systems," the report said.

One of RECAT's major findings is that air quality standards and vehicle standards should be changed.

The feasibility of a mass-produced gasoline-powered car meeting the 1976 standards is "questionable" and would mean substantial costs if it could be done. An alternative engine appears "unlikely."

RECAT appears to favor a NOx level of 1 to 2 grams/mile (which would mean a 10 percent loss in fuel economy) instead of achievement of an NOx level of 0.4 grams/mile by an exhaust gas recirculator with a fuel penalty of 35 percent. While a stratified charge engine would reduce this fuel penalty, it is unlikely by 1976. Stringent control of NOx is very expensive and not important in most areas—only in Los Angeles.

RECAT said the difference in legislative treatment between stationary sources and mandated percentage reductions for the automobile "does not appear to have any relationship to the relative effects of stationary and mobile sources on the health and welfare of the country, as measured by the economic costs of damages attributable to the different pollutant sources."

The "two-car" strategy appears to be a sounder approach than the present national approach to the auto emission problems, the study said. This calls for the production of two types of car—a low-emission unit for regions that need it and a lower-cost, higher-emission vehicle for parts of the country where air quality would not be essentially degraded by less controlled vehicles.

So far, safety standards—with the early ones reflecting the state of the art—have been cost effective, but the "reservoir of cheap and easy beneficial changes appears to be running dry."

But RECAT cautions that a simple assessment of costs may not be very useful, since costs must be balanced by socially desirable goals.

It said car-generated air pollution cannot be separated from that of stationary sources and "purely technological measures may be inadequate for air pollution control."

The same is true for passive protection for car passengers—which may not be "technologically possible or economical, and nontechnological steps may be required to persuade motorists to take active safety measures in their own behalf."

Therefore, government agencies should have flexibility and ways to explore alternatives—not possible with specific standards set forth in the Clean Air Law.

Standards should be set only after cost-benefit studies and side effects are known, the study said. Otherwise, there may be "unnecessary economic losses, loss of regulatory credibility, protracted formal processes and litigation." Consideration should be given to leadtime, it added, or substantial costs are incurred.

Meeting emission and safety requirements will add $1,380 to the price of the average car by 1976, according to auto maker estimates. The committee's own staff projection was $873, including $350 for emission controls and $523 for safety equipment.

"Regulation should not be based upon a blind faith in technology," the study said. Setting standards beyond the known state of the art—which the auto companies claim was done in the air-bag standard—is not likely to result in "wise governmental decision-making or to provide the greatest net benefits to society."

While the government may push "reluctant industries," it should not presume breakthroughs in technology are possible if enough money is spent, RECAT said.

"The regulation of automobiles is not a game in which higher costs are imposed on the industry. It is the public which must bear the costs."

The study called for a coordinated approach by both Congress and the executive branch.

Other points made in the report include:

Major changes in auto design are extremely costly when outside the routine cycle for model changeover. It was estimated that an extra cost of at least $100 million will be incurred in meeting bumper standards.

Imposition of advanced highway standards, as exemplified by the Interstate system, has yielded 30-year safety benefits amounting to 58 percent of the cost of the highways. When operating cost and time savings are added, the Interstate highways return more in benefits over 30 years than their original cost.

Safety improvements with enormous and unrealized potential annual benefits include elimination of drunk drivers ($3.8 billion), mitigation of pedestrian casualties ($1.9 billion) and improved accident emergency treatment ($1.4 billion).

[From the Tallahassee (Fla.) Democrat, Apr. 20, 1972]

PROTECTIVE AIR BAG MAY NEED MORE ENGINEERING

The fact that the protective air bag did not work properly in the federal government's auto safety test at Phoeniz, Ariz., is sure to renew the controversy about the possible effectiveness of this device.

At present the auto manufacturers are under orders from the federal government to include air bags on new cars in the future. But there have been strong protests against the order because some manufacturers contend the air bag is not entirely workable. Their objections seem to have validity.

In the crash test this week, an air bag failed to inflate in three-hundredths of a second as expected, and dummies were thrown into the windshield, shattering it. Presumably, if the dummy on the passenger side of the front seat had been a person, he would have been seriously injured or killed.

The air bag was installed in an experimental car designed to withstand a crash at 50 miles an hour. The car came through the crash in fairly good shape because of an unusual front bumper design, the dummies inside didn't fare so well.

The purpose of the tests by the U.S. Department of Transportation is to develop a vehicle which will allow passengers to walk away from serious accidents with only minor injuries. This objective is most desirable, and the hope is that new designs will result from these tests which will make autos safer.

There is a good chance, however, that the air bag is not the great safety device its developers say it is. Auto manufacturers also have conducted tests which did not show good results. However, these tests seem to have been ignored because some government officials felt the manufacturers simply were trying to find evidence to kill the idea.

It is possible, of course, that modifications to the air bag will make it more workable in the future. However, there are problems with this type of device which raise serious questions about its value. Before manufacturers are required to install it in cars, there should be enough tests to insure that it will be more of a help than a hazard.

[From the Vancouver, B.C. (Canada) Sun, Apr. 19, 1972]

FAILURE OF AIR BAGS MARS DEBUT OF $4 MILLION CAR

PHOENIX, ARIZ. (AP).—Air bags failed to inflate during the test of an experimental car and sent the lifelike dummy occupants smashing into a thoroughly cracked, but unshattered windshield as the vehicle slammed into a concrete wall at 50 miles per hour.

The car was developed with a $4 million federal grant and survived the crash better than a conventional auto during the test Tuesday witnessed by U.S. Transportation Secretary John Volpe and representatives of 22 auto manufacturers.

In addition to the smashed windshield, the experimental car suffered some apparent damage to the front bumper portion, but the rear two-thirds was virtually unmarked.

The conventional car was demolished as it slammed into the wall.

The air bags, designed to protect passengers who aren't wearing seat belts, were supposed to inflate within .03 of a second after impact. Scientists said they believed the energy source failed to function.

Sol Davis, chief of systems engineering for Fairchild Hiller, developer of the auto, said an immediate investigation would be conducted to determine why the air bags failed to inflate.

"We believe the car held up better than expected." Davis said, "but we're going to have to find out very soon why the air bags failed. "I'll assure you it will be the subject of serious investigation."

Watching from 150 feet away, Volpe said the results of the experiment and others could be the key to sweeping changes in the auto industry in the not too distant future.

The dummy in the front passenger seat test was split in two at near the middle of the back. A third dummy, in the back seat, reportedly showed no visible signs of damage.

Crash data will have to be fully analysed before it can be determined why the air bags did not work and what the consequences would have been for the occupants, a spokesman said.

The conventional car's hood was shoved through the windshield and its front end was flattened and pushed back into the passenger compartment.

[From the Phoenix Gazette, Apr. 19, 1972]

VOLPE HAILS SAFETY CAR TEST CRASH

(By John Alba)

Despite the failure of a passive restraint "air-bag" system in the $4 million Fairchild-Hiller Experimental Safety Vehicle, Secretary of Transportation John A. Volpe called the crash test of the car "a tremendous stride forward."

Moments before, the futuristic vehicle, with three dummy passengers aboard, sped down a quarter-mile concourse at 50 miles per hour and slammed into a solid barrier.

The front wheels of the car rose several inches above the ground and then bounced back with surprisingly little damage to the front of the vehicle.

(Volpe told The Phoenix Gazette the car did not look much worse than a conventional automobile after a 5-m.p.h. crash.)

While the vehicle suffered little structural damage, the dummies inside were another story. The air bags which were to have inflated in 30 milliseconds, did not go off and both front seat "passengers" were thrown against the windshield, which shattered, "exactly as it was supposed to."

The dummy in the right front seat literally came apart, at the middle, or "at the base of the backbone," a Department of Transportation spokesman said.

However, the failure of the air bags to inflate, which was caused by a "lack of energy to the 24 points that would have attentuated the system," was not viewed with alarm by the secretary.

"The fact that one of the facets of the system did not function and was not tested doesn't disturb me at all," he said. "We know air bags work. We have tested them, using live people, not dummies, at speeds of 32 m.p.h. We will, of course, find out why the power did not get to the attenuators."

The full results of yesterday's crash test at the Deer Valley facilities of Dynamic Science, a local research firm, will not be known for several weeks, Volpe said.

"But, if you compare how this vehicle came through the test to the way a conventional vehicle would have, I think you'd have to call the results spectacular. I didn't think they would be able to open the hood, yet just seconds after the crash, they did open it with no trouble."

On display at the test site was a conventional vehicle crashed earlier at the same speed. Unlike the safety car, the conventional vehicle was barely recognizable as a car. The entire front end of the car was accordioned and pushed into the passenger compartment.

Also on display was the AMF safety car crashed about three weeks ago. Both the ESVs showed little if any damage to the passenger compartments, with the exception of the damage caused by the dummies in the Fairchild car when the air bags failed to inflate.

Volpe predicted that at least three to six years of "lead time" would be needed for the auto industry to begin mass producing vehicles with the features of the safety cars.

He added that the safety features might add as little as $100 to the cost of smaller cars and as little as $300 to the cost of larger ones, but that "it will take time to fully assess production costs of the safety features."

However, the automobile buyer "won't have to sacrifice too much in styling from the appearance of the safety cars," he said, adding that "as an automobile buyer, I'd rather have the extra safety than the extra chrome on my car."

Sol Davis, chief of systems engineering for Fairchild-Hiller, said at the test site that Fairchild was "very pleased with the structural performance of the vehicle."

Regarding the failure of the air-bag system, Davis noted that the dummies were not strapped down with seat belts as a provision of the test contract. "The passive restraint system we were using failed," he said. "I don't know why."

[From the Seattle Daily Times, Mar. 9, 1972]

DOCTOR CALLS AIR BAGS IN AUTOMOBILES SAFETY HOAX

(By Al Dieffenbach, Medical Editor)

As a safety feature in automobiles, the air bag is a hoax, a Seattle specialist in automotive medicine said here Tuesday.

"I predict that you will never see air bags in production automobiles," Dr. Peter Fisher told the Kiwanis Club. He said they have never been clinically tested, they have to be specially repacked and are only an excuse to have seat belts removed.

The internist, an assistant clinical professor of medicine at the University of Washington, blamed "badly designed automobiles" and "atrocious" highway engineering for many of the 55,000 highway deaths that occur in America each year.

Hood ornaments are wasteful, expensive and injurious, basic body construction is weak and bumpers are worse than useless, Dr. Fisher told the Kiwanians.

Dashboard design, unsafe steering columns and ashtrays on the door or arm rests in the back seat have added to the injury toll, he said.

He told of radio knobs that penetrated skulls, ignition keys removed from knees, and elbows that would never be straight again after contact with back-seat ashtrays.

"The automobile stylist rules supreme. The automobile manufacturer is not your benefactor," Dr. Fisher said.

The 55,000 annual traffic deaths translate into 1,000 a week or 150 a day, he said, but these are "phony" figures because they ignore the 5-million injuries caused each year in traffic accidents.

Some of the dead are better off than some of the injured, the physician said. Many of the injured are alive, but some will never talk again and some will never walk again, he said.

"Speed doesn't kill; the major cause of death and injury is being thrown out of the vehicle," Dr. Fisher said.

"You can walk away from your inevitable collision if you have been wearing a lap belt and a diagonal shoulder belt," he added.

"Nobody should be in any part of an automobile without restraints. The occupants of the back seat are a major cause of injury to those in front seats when seat belts aren't used. They become missiles."

Dr. Fisher said there have been no deaths in automobile accidents of persons wearing the "three-point" lap and shoulder belts, or of drivers using a lap belt in a car with a collapsible steering column.

The lap belt alone is obsolete, the physician said. The driver can be hurt when the upper part of his body is thrown forward, or the belt allows him to slide out from under it or the belt itself catches him under the chin as he is sliding under it.

"But a lap belt is better than nothing," he said.

"Motor-vehicle accidents are the leading cause of death among children," the Kiwanians were told.

* * * posing their children to drafts, but let them ride unrestrained in an automobile or allow them to drive and ride in small automobiles, Dr. Fisher pointed out.

"It is no economy to have our children in a small, inexpensive car or one that is small and sporty," he said.

A 20-year veteran of sniping for automotive safety, Dr. Fisher said he became involved in the field partly through the death of his father in a traffic accident.

He said he also was impressed while serving as an automobile race-track doctor during his dollar-short medical-student days. "I never saw a fatality in the thousands of high-velocity accidents that I witnessed," he said.

The difference was made by crash helmets, seat belts, roll bars and other safety equipment which the auto racers used.

"Automotive safety is an idea whose time has come," Dr. Fisher agreed.

[From the Ann Arbor (Mich.) News, Mar. 27, 1972]

SEAT BELTS BEFORE AIR BAGS

A recommendation of the recent conference on the problem driver to make the wearing of seat belts mandatory should be welcomed in the Legislature and translated into action.

The idea isn't new, but the motoring public hasn't been ready for it. It isn't ready now, for that matter, but when the government orders such passive restraints as air bags installed in cars, it's past time for stronger steps to encourage use of seat belts.

The value of seat belts in saving lives has been proved over and over, and yet more than a dozen years after their introduction less than a majority of drivers use them. Even here in Washtenaw County where a medical research team has produced impressive evidence of seat belts' effectiveness in a study conducted over a number of years, the use is probably not much greater than in other areas.

Air bags at their present stage of development have some serious disadvantages. But more than 40 per cent of drivers and front seat passengers killed in auto accidents could be saved if they wore seat belts, in the opinion of Dr. Robert L. Hess, director of the University of Michigan's Highway Safety Research Institute.

A law forcing the wearing of seat belts may seem too much like government interference in people's lives, but the law has always frowned on suicide. And as Jenkin Jones pointed out in his recent column in The News, we work awfully hard in this country to protect the idiots from themselves.

[From Super Service Station, Chicago, Ill., April 1972]

PRESS TIME BRIEFS

A report sponsored by the White House and done under the auspices of the President's Office of Science and Technology has come up with data that tend to support many of the complaints that have been made that costs of emission control and auto safety are excessive. The so-called RECAT document (Report of the Ad Hoc Committee on Regulatory Effects on the Costs of Automotive Transportation) took a dim view of possibility of mass producing gasoline powered cars that meet the 1976 emission standards in existing law to be "questionable" at best, and noted that considerable extra costs would have to be paid if it is indeed possible. Timely development of an alternative power source seems "unlikely." Report implies that existing air quality requirements for the future should be eased. It noted that this would provide consumers a significant saving in fuel over the projected consumption for vehicles equipped to meet air quality demands embodied in existing law.

Safety standards mandated by the government so far, the RECAT report says, seem to have been worth what they cost. But it warns that the "reservoir of cheap and easy beneficial changes appears to be running dry." It observes that air bag cost "is substantially higher and the predicted benefit is no greater than the corresponding cost and benefit of the well-known, time-tested three-point belt harness system, assuming high utilization." Report suggested that local ordinances requiring seat belt use might succeed in making more people use them. Safety benefits to be obtained from improved highways were extolled in the report. It says the interstate system will more than pay for itself over a 30-year period through increased benefits to be realized by eliminating drunken drivers.

[From the Detroit News, Apr. 19, 1972]

Air Bags Fail in U.S. Crash Test

SAFETY CAR SURVIVES, DUMMIES "KILLED"

PHOENIX.—The U.S. Department of Transportation (DOT) had a party here yesterday for a safe car, but the air bag—one of the guests of honor—failed to pop out as scheduled.

The occasion was a crash test of an experimental safety vehicle, one of several being built for the department as test cars to demonstrate safety features that auto makers could build into future production cars.

The $2 million test vehicle survived a 50-m.p.h. crash into a steel barrier with barely a scratch, but the dummy occupants were apparently "killed" because three air bags designed to protect them failed to inflate.

The test vehicle—one of two built for DOT by Fairchild Industries' Republic Division under a $4 million contract—included a bumper and frame system that absorbed much of the energy of the collision and minimized damage to other parts of the car.

After the car slammed into the steel barrier, its hood was intact. By comparison, a standard production car which crashed at the same speed was demolished from the trunk forward.

The Fairchild car also featured a periscope-type rear-view mirror for greater visibility, and anti-skid brakes.

While DOT officials argued that it was not significant, the embarrassing air bag failure during the department's own test recalled questions raised by air bag opponents about the wisdom of requiring them in future cars.

Federal standards demand that 1976 and later model autos be equipped with restraint systems that require no occupant action (such as buckling a seat belt) but which protect passengers from injury or death in crashes of up to 30 m.p.h. into a barrier. Air bags are the approach favored by the government.

In theory, the balloon-like devices would inflate within a fraction of a second of the beginning of an accident, preventing occupants from being pitched into potentially lethal interior components.

Auto makers and other air bag critics contend it is technically unfeasible to design such a system that will always work when it is supposed to and never inflate accidentally.

Douglas Toms, head of the National Highway Traffic Safety Administration, said someone apparently failed to throw a switch necessary to provide electrical current to the sensors which trigger the air bag system.

Another department official emphasized that the experimental system was designed for requirements beyond those set for 1976 cars.

Even if the problem was in the air bag system itself, he indicated, "that doesn't mean that systems being designed for 1976 production cars are affected by what happened here."

After watching from the desert testing site, U.S. Transportation Secretary John Volpe told 22 auto manufacturing representatives and several hundred others that the results of the experiments here could create sweeping auto design changes in the not-distant future.

DOT hopes to produce a vehicle which will allow passengers to walk away from serious accidents with minor injuries at worst.

"Some manufacturers will be putting these ideas into production as soon as we find out they work," Volpe said. "But when we determine what ideas are good and feasible we will issue federal standards that must be met, leaving enough time for manufacturers to meet them."

[From the Washington (D.C.) Evening Star, Feb. 8, 1972]

Automobile Air Bags Should Be Further Tested

(By James J. Kilpatrick)

Sen. Abraham Ribicoff of Connecticut sounded off the other day with a fine rhetorical question. He was worried about the administration's pending bill for drastic reform of the public welfare system.

"Don't we have an obligation," asked the senator, "before we embark on a national program costing billions of dollars, to test this program out to see how it works?"

The question is a little too long, perhaps, to be chiseled in stone in the Senate chamber, but it might usefully be worked into old fashioned samplers to hang in each senator's office. Of course the Congress has such an obligation! As Patrick Henry incessantly advised his fellow founding fathers, that is part of the value of a federal system: In encourages small-scale experiments as a safeguard against large-scale blunders.

Apprehension is growing that precisely such a large-scale blunder is in prospect, not only in welfare but in an unrelated field also: Automobile air bags. The Department of Transportation, unwilling to abide by Ribicoff's Rule, still is insisting that beginning with 1976 models, all automobiles offered for sale in the United States must be equipped with passive-restraint devices meeting certain standards. What this means is air bags.

Several weeks ago a divided House Committee on Government Operations warned against premature imposition of the air bag requirement. Agreeing that the device has "an obvious potential" for saving lives, a committee majority nevertheless spelled out a dozen thoughtful reservations.

The air bag relies upon electrical impact sensors. These activate an explosive mechanism, which releases gas or compressed air, which inflates a large nylon bag, which pops out of a hidden compartment, thereby imposing a cushion between the passenger and the dashboard. All this happens in 40 to 60 thousandths of a second.

It sounds like something Rube Goldberg might have invented. To say the least, the system includes a number of component parts that might malfunction. As the committee observed, the sensors and the gas container must remain perfectly ready for split-second activation "for a number of years, under varying temperature, atmospheric pressure, vibration, and other environmental conditions.

The bag cannot be too hard; it cannot be too soft. The blasting device must rupture the gas container without simultaneously rupturing the passengers' ear drums. The triggers must be so sensitive that they will not fire in response to the minor bumps of parking or of bumper-to-bumper traffic.

It is further objected that the air bag offers no protection (as seat and laps belts do) against panic stops, severe skids, rollovers and sideswipes. There is serious question, in the majority's view, whether air bags will protect a passenger who happens to be "out of normal seat position"—a not unlikely prospect—at the moment of impact.

In fairness, it should be said that a six-member minority of the committee indignantly dismisses these objections as unwarranted. The minority is confident that air bag systems would have an enduring reliability of 99,999 percent, that problems of bag design have been solved, and finally, that 13,000 lives could be saved each year through adoption of the requirement.

It makes no difference, at the moment, which side is right. The point is that serious and responsible men strongly disagree on the merits of a national requirement.

Patrick Henry was on the right track nearly 200 years ago, and Abe Ribicoff is voicing the same wise counsel today. To abandon seat belts (this is part of the deal), and to put reliance upon a complex system not yet fully tested in real-world driving conditions is, in a word, to risk folly. First, let's see how it works.

[From Ward's Auto World, April 1972]

Air Bags: From Baloney To Guinea Pig Stage

Henry Ford II, peering over half-rimmed glasses, was at his quotable best: "We think air bags are a lot of baloney. They're too damned expensive and they won't work."

That was 15 months ago. Air bags are still expensive; no one estimates they'll cost less than $100 per car, even in high volume installation. There remains the very real fear that the bags may fire accidentally, actually causing a collision, or that even worse they'll fail to fire when most needed.

And air bags may yet turn out to be "baloney" as Mr. Ford suggested. His company, along with Chrysler Corp. and American Motors Corp., has filed suit in the U.S. Sixth Circuit Court of Appeals in Cincinnati seeking judicial review

of the federal standard that requires passive restraints—air bags—on 1976 model cars. They argue that the bags may not be in the public interest at all because the systems have not been proven.

The auto industry's position on the air bag won support late in March from a special White House study aimed at determining costs of federally-mandated car standards. The report on the "Regulatory Effects on the Costs of Automotive Transportation" (RECAT) commented:

"The potential benefit of the air bag system, using the optimistic predictions of the Department of Transportation, is less than the potential benefit, as established by experimental evidence, of 100 percent usage of the three-point harness (belt) system."

Until the issue is fully decided, however, Ford and General Motors Corp. are hedging their bets by moving ahead with on-the-road air bag testing.

SAFER THAT WAY

Mr. Ford's company has been running 90 cars equipped with air bags in its engineering test fleet since last fall. These units, however, were not activated because, as one Ford wag put it, "they're safer that way."

Now Ford is outfitting 300 1972 Mercury Montereys with functional air bags. Approximately half of the systems were developed by Allied Chemical Corp. and the other half by Eaton Corp.

Allstate Insurance Co., whose board chairman, Judson B. Branch, has strongly backed air bags, will take delivery of 200 of the Mercurys. Ford's engineering test fleet will get the other 100.

The 300 test cars will remain in service for 12 to 18 months, accumulating 15,000 to 20,000 miles, Ford says. But even before the project got off the ground, Ford said that in two of the first 83 cars in which the Eaton system was installed, a problem was detected in the impact sensor circuitry. This circuit senses whether the entire system is ready to function properly. The problem: An improper soldering operation. Eaton volunteered to replace all 83 systems and to eliminate the problem.

NARROW ESCAPE

The Ford/Allstate tests represent a start in obtaining the necessary field testing, but the scope of the project is rather narrow. The right front seat passenger will be the only occupant protected by an air cushion. There is none for the driver and Ford has installed a bolster-armrest in the center of the front seat so that there is no room for a center-seat passenger. Furthermore, the right front seat occupant and driver must hook up seat belts as well or the car won't start; each is equipped with an ignition interlock device that keeps the car from starting unless belts are fastened.

General Motors Corp. will start its air bag field testing this fall with 1,000 '73 model Chevrolet Impalas. The cars will be driven by GM, Department of Transportation, and fleet personnel. GM's system protects the driver and one front seat passenger. It won't require seat and shoulder belts.

GM Board Chairman Richard C. Gerstenberg underscored in a Chicago address that "we have serious reservations about the air bag" centering mainly around reliability.

Mr. Gerstenberg emphasize that a build 5 million '76 cars (GM share of the estimated market at that time) equipped with air bags, the corporation should test 50,000 to 100,000 models equipped with the bags and phase in more in '75. GM has no plans to do this, however, at the moment. GM should commit air bag tooling by July to meet the '76 standard, he said. "We wish we could get the benefit of this test (the 1,000-car test) before it is necessary for us to commit for tooling, but the governmental deadlines and our own lead-time requirements make this impossible," he said.

2. DEPLOYMENTS

Based on normal driving statistics, GM expects that of the 1,000 test cars, 24 will be involved in accidents during the first year with sufficient impact to deploy the air bags. If there are misfirings, this figure will rise.

Until now, only baboons and dummies have been used in actual air bag impact testing. Now it'll be guinea pigs—human ones.

Air bags, perfected or not, may come in another four years. But to concentrate on this one "passive" solution without taking "action" on other fronts obfuscates the target: Reduced highway fatalities.

[From the Evening Bulletin, Philadelphia, Pa., May 24, 1972]

AIR BAG FAILS TO WORK IN AUTO SAFETY DISPLAY

DETROIT. (UPI).—An air bag auto safety system failed to inflate in a crash test arranged to prove its reliability.

The dummy driver in the car broke the steering wheel and cracked the windshield with its head as the test vehicle slammed into a barrier at 30 miles per hour.

The air bag, which was supposed to inflate and provide a protective cushion for the driver, remained inactive in the steering column housing.

The deploying mechanism apparently was damaged in the crash as technicians were unable to fire it manually.

OFFICIAL LEAVES

"This is most embarrassing," said Prof. Lawrence M. Patrick, who conducted the demonstration yesterday at the Wayne State University bio-mechanics center for the National Motor Vehicle Safety Advisory Council.

Judson Branch, chairman of the council, an agency of the U.S. Department of Transportation, had been scheduled to talk with newsmen after the demonstration. He left before he could be questioned and an associate said he had to catch a plane.

Patrick, an expert on automotive safety, said the air bag was not properly tested prior to the demonstration.

BATTING AVERAGE DROPS

"The batting average on air bag tests was .500 until today and now has dropped to .333," counsel member Henry Hill said. One of two earlier tests was successful.

Passive restraint systems will be required, under governmental safety standards, for 1976-model cars.

The air bag, designed to activate in frontal barrier crashes at a point when impact speed is great enough to cause serious injury or death, is the only passive restraint system which has undergone thorough testing so far.

Auto companies are seeking a one-year extension of the 1976 deadline so that data can be accumulated on the effectiveness of other passive and shoulder harness systems.

[Danville, Va., Bee, Mar. 6, 1972]

ARE AIR BAGS SAFE?

Today's editorial cartoon by Bill Mauldin is strictly for fun. But it raises a question about which more and more people are feeling apprehension: Could automobile air bags be more dangerous than helpful?

Without having agreed upon a workable model much less having tested such a device, the U.S. Department of Transportation arbitrarily has ordered the installation of air bags in all cars starting with the 1976 models.

Theoretically, upon sufficient contact with an object, an automobile's under-the-dash air bag would inflate instantly and prevent the occupants from being thrown against the steering wheel, dashboard or windshield.

Beautiful!

But * * * A House Committee on Government Operations has been giving considerable study to the proposal and a majority has come forth with a stern warning against premature enforcement of the requirement. The majority saw "an obvious potential" but it also spelled out numerous reservations.

To be more specific about the air bag itself, it relies upon electrical impact sensors which activate an explosive mechanism, releasing gas or compressed air, inflating the bag, which balloons out from its hidden compartment. And all of this happens in 40 to 60 thousandths of a second—they say.

The entire system must remain constantly ready "for a number of years, under varying temperature, atmospheric pressures, vibration and other environmental conditions." It must remain critically sensitive yet not respond to minor bumps.

Should there be malfunction, the driver's vision would be obscured and he would be unable to control the car. The possibility of suffocation without injury

even has been raised. The bag must be of an exact firmness without being so hard as to cause damage itself. And the blasting device must be sufficient to rupture the gas container without rupturing ear drums.

The Department of Transportation prefers to call the air bags "passive-restraint devices" and says they would make seat belts and shoulder harnesses unnecessary. To this, opponents reply the bags alone would offer no protection againt panic stops, severe skids, rollovers and sideswipes.

All of this is actually frightening rather than reassuring. Yet a six-member minority on the House committee insists the system could save 13,000 lives per year. Our information did not specify how this figure was determined.

Regardless of which side is right, the system should be perfected and thoroughly tested before it—with the added costs to purchasers—is thrust upon the country.

[From Automotive News, Mar. 6, 1972]

Test Safety, First

SYSTEMS MUST BE ACCEPTABLE

Two announcements were made in Chicago that we think are strong steps forward in the search for realistic, practical safety devices.

Ford Division's John Naughton said that Ford will offer immediately, at no extra cost, a seat-belt interlock on 1,000 Pintos.

General Motors Chairman Richard Gerstenberg announced the next day that Chevrolet would install air bags in 1,000 1973 Chevys, although none are expected to reach the consumer.

We were surprised to learn that Ford, even before the consumer has become used to the seat-belt buzzer/warning light on '72s, plans to place in consumers hands the same basic system that will, according to present rules, be mandatory in 1974.

Naughton summed it up quite well when he said that Ford wanted to test the "irritation factor." Any system that is going to work must be acceptable to the people who use it. We hope that Ford will make this system at least an option on all 1973 Ford products. We think that a number of consumers will appreciate it.

Obviously, the only way to really find out whether air bags, or any other device, can really do the job, is to test it. Air bags, because of their complex nature, require an even greater amount of testing and we applaud GM for going ahead with a public test.

Statistically, we are told, GM expects about 24 deployments during the first year. We are sure that when, and if, those tests are completed, the program will then be expanded. Perhaps the federal government will be glad to pay for the installation of air bags on all federal vehicles in 1974 model cars. We shall have to wait and see.

These are just two examples, of many, that demonstrate that automobile manufacturers are interested in safety. We applaud these tests and welcome further tests of other systems. Now, if only the NHTSA lets the tests continue without changing the rules.

[From the Detroit News, Apr. 7, 1972]

Air Bag Programs Disappoint Safety Chief

(By Robert W. Irvin)

Plans by the auto industry to begin testing safety air bags in cars apparently fall far short of the goals that the federal safety chief hoped would be met.

Ford Motor Co. is now starting a new program to test from 300 to 1,000 cars and General Motors Corp. plans to install air bags in 1,000 1973 Chevrolet Impalas.

Douglas Toms, head of the National Highway Traffic Administration (NHTSA), has been pressing for a bigger test—with at least 10,000 cars in use.

Toms apparently believes tests of a few hundred to a few thousand cars are too small to be of much value.

"It is no secret that we have suggested the very minimum ought to be 10,000 cars," he said.

With the smaller numbers of air bags that the auto companies are testing, there just isn't the likelihood of a statistically meaningful sample of cars in accidents where the bags are inflated.

(GM has said that of its 1,000 cars to be tested, only 24 can be expected to be involved in accidents next year, based on available accident statistics.)

Toms said he had hoped that with GM's delay to the 1973 models, the auto company might expand its test. But that is not the case.

It is understood GM delayed its testing program at least partly for budgetary reasons.

One federal official said GM was going to start the big public highway testing this spring but rescheduled it for this fall because it was "cheaper."

"They didn't want to hand tool the bumper," he said.

Toms explained that the GM air bag system has the crash sensor in the bumper and that to install it on 1972 models would mean handmaking the bumpers.

"When they saw the cost figures they rejected them," Toms said.

On the other hand, all the 1973 GM cars will have new safety bumpers required by the NHTSA and fitting the air bag sensor apparently will pose no problems.

It's understood GM President Edward N. Cole was all for testing the bags on the 1972 models but new GM Chairman Richard C. Gerstenberg and Vice-Chairman Thomas A. Murphy vetoed such a plan.

Toms doesn't seem concerned about the delay. He notes that "when you're talking about 1973, you're only talking about a few months from now because they'll be running the first cars off the line in July to be shipped to fleets."

But consumer advocate Ralph Nader is critical of the GM timetable. He noted that Gerstenberg has said GM is up against a lead-time deadline of July, 1972, for ordering prototype tooling for air bags to be used on 1976 models. (The NHTSA recently delayed the air bag rule from 1974 to 1976 models.)

Nader noted that Gerstenberg said the company wouldn't have enough test experience by July to order tooling, yet on the other hand was not starting the test program until fall.

Gerstenberg's position is that "we do not yet know for sure how to build a proper system . . . This field test we are planning for some of our 1973 models should help."

Nader said in a letter addressed to Cole that Gerstenberg is trying "to erect additional obstacles to the adoption of passive restraints. His lead-time argument is a well worn device. In fact, it was previously employed by GM to persuade the NHTSA to postpone the 1973 model year deadline for passive restraints.

"Now, 18 months later, it is being used again with a few modifications as the justification for further postponement of a similar standard beyond its present 1976 model requirement . . . Mr. Gerstenberg's feigned wishfulness for more time is a blatant misrepresentation of the facts . . .

"The implication of the Gerstenberg remarks is that field testing is the key to production tooling. In fact, field testing only confirms the design that has been created during research and development. The Gerstenberg formula for completion of field testing before tooling for prototype production appears to be a General Motors invention.

"Was the Vega (with its new aluminum engine block) completely tested before prototype tooling was ordered? Or is the field testing requirement just a handy device for diffusing public pressure?"

In the letter to Cole, Nader added: "It is reported from within your company that you are more enthusiastic about the air bag than Mr. Gerstenberg and that there is some friction between yourselves over this policy difference. Indeed, back in May, 1971, you described the air bag then as 'extremely reliable.' Several weeks ago your superior was listing deficiencies which impeach your foregoing judgment."

[From the Chicago Tribune, May 26, 1972]

Air Bag Tests Rated Questionable

(By James Mateja, Auto Editor)

If Allstate Insurance Co.'s crash demonstration of an air bag equipped car with a live volunteer inside was designed to refute the controversy surrounding the reliability of the system, it failed, even tho the passenger survived a 17½ mile-an-hour barrier crash unharmed.

Allstate, in revealing details this week of air bag crash tests conducted for it by Dynamic Science, independent tester, two weeks ago in Arizona, said the demonstration was "designed to dispel some of the unfounded fears" related to the bag, such as premature deployment or no deployment at all.

But in talking to industry sources in Detroit, the matter of reliability is still a big question mark. Allstate tested only 3 cars out of a fleet of 200 air bag equipped 1972 Mercurys supplied by Ford Motor Co. for its own testing. Critics were quick to point out the three successful bags are a far cry from the 10 million air bags that would be installed in cars if the federal passive restraint standard goes into effect in 1976.

JUST ONE HUMAN

And of the three tests, only one was with a human volunteer. One was an empty car running into barrier at 5 m.p.h. to prove the bag wouldn't deploy at low impact, and the other involved a car which was run off a ramp at 45 m.p.h. to prove the same thing. The tests were successful.

But skeptics point out that Allstate's live passenger wore a seat belt, while the federal standard calls for 30 m.p.h. collision protection without belts. A source at G.M. in Detroit contended the Allstate volunteer would have survived with little injury without the bag and just the belt.

Donald L. Schaffer, Allstate vice president and a member of the board of governors of the Insurance Institute for Highway Safety, in an interview, said three tests "do not prove full reliability, but do prove the bags are most reliable at this stage."

Among the 200 fleet cars there have been several low speed "fender benders" in which the bags shouldn't have deployed and didn't, he said.

Will Allstate back its air bag support by underwriting liability coverage for premature deployments or bag failures in accidents? It already does on the 200 fleet cars, Schaffer asserted, "and we probably will write coverage in the future on reliable systems by manufacturers which meet their own certifications.

In other words, we aren't talking about air bags installed at the corner gas station," he added.

Critics contend the bag was successful in the Allstate test because the man was belted and kept in perfect position for protection, but the 1976 law calls for no seat belts.

COULD RUN WITHOUT

Schaffer contended, however, that the test could have been run without the belt "with no different results and the passenger, a professional driver, even volunteered to do so, but since we advocate the government require the use of air bags in combination with lap belts, we used the belt."

While the Allstate tests were successful, the last two public demonstrations of the bags have been failures, one by Fairchild-Hiller Industries in Arizona in which the bag failed and the dummy was "killed," and another by Wayne State University Prof. Larry Patrick in which the dummy was thrown into the windshield when the bag failed. In both cases human error was cited.

So the question remains as to what the human error factor will be when and if 10 million bags are installed each year.

CONDUCTED OTHER TESTS

In its 1972 Report on Progress in Areas of Public Concern, just released by G. M., Louis C. Lundstorm, director-environmental activities staff, said the corporation has conducted 34 live volunteer air bag tests at Holloman Air Force Base in New Mexico and were successful at speeds up to 31.4 m.p.h. He said, however, evidence showed that "our air cushion development work has been successful, but on a limited basis."

He said the hazards of the effects of rebound, noise, occupants sitting out of position, and obscured driver vision once the bag is inflated still exist and "these are unknowns that make the burden of risk lie heavily."

[From the Los Angeles Times, Apr. 19, 1972]

Air Bags Fail To Function in Tests of Prototype Safety Car

$2 million vehicle built for transportation department undamaged in 50 m.p.h. crash, dummies are "killed"

(By Dan Fisher)

Phoenix.—The U.S. Transportation Department had a party here Tuesday for a safe car, but the air bag—one of the guests of honor—did not show up.

The occasion was a crash test of an experimental safety vehicle, one of several being built for the department as test beds to demonstrate safety features auto makers could build into future cars.

The $2 million test vehicle survived a 50 m.p.h. crash into a steel barrier with barely a scratch, but the dummy occupants apparently were "killed" because three air bags designed to protect them failed to inflate.

While Transportation Department officials argued that it was not significant, the embarrassing failure during its own test recalled questions raised by air bag opponents challenging the wisdom of requiring them in future cars.

CRASHES AT 30 M.P.H.

Proposed federal standards demand that 1976 and later model autos be equipped with restraint systems that require no occupant action (such as buckling a seat-belt) but which protect passengers from injury or death in 30 m.p.h. crashes into barriers. Air bags are the favored approach.

In theory, the balloon-like devices would inflate within a fraction of a second at the instant of a collision, preventing occupants from being pitched violently into the steering wheel, windshield or dashboard.

Auto makers and other air bag critics contend it is technically unfeasible to design such a system that will always work when it is supposed to and never inflate accidentally.

Douglas Toms, head of the Transportation Department's National Highway Traffic Safety Administration (which sets safety standards for new cars sold here), said someone apparently failed to throw a switch, necessary to provide electrical current to the sensors which trigger the air bag system. The exact cause will not be known until an investigation is completed.

EFFECT ON '76 CARS

Another department official emphasized that the experimental system was designed for requirements beyond those set for 1976 cars. Even if the problem proves to be in the air bag system itself, he indicated, "that doesn't mean that systems being designed for 1976 production cars are affected by what happened here."

Some who oppose air bags hope that—added to previous controversy—Tuesday's test will undermine the government standard. One small group, representing an association of auto importers, cheered when Transportation Secretary John Volpe announced minutes after the crash that the air bags had failed.

Other features, meanwhile, impressed the approximately 250 state and federal government officials and auto industry representatives attending the crash test.

The vehicle—one of two built for the Transportation Department by Fairchild Industries' Republic Division, under a $4 million contract—included a bumper and frame system that absorbed much of the energy of the collision and minimized damage to other parts of the car.

After slamming into the steel barrier, the car's hood was opened routinely. By comparison, a standard production car, crashed at the same speed and exhibited for comparison, was demolished all the way back to the trunk.

The Fairchild car also featured a periscope-type rearview mirror for greater visibility plus antiskid brakes.

The experimental safety vehicle program is aimed at demonstrating cars capable of withstanding 50 m.p.h. collisions without serious injury to occupants.

"Our ultimate goal is that many of the design solutions developed by this program will appear in production cars," Volpe said.

In addition to Fairchild, American Machine & Foundry Co. Inc. has built two safety cars under the 18-month-old program.

The Transportation Department will compare test results on cars from both firms, then award a contract to one to build several more test vehicles for further study. It is unknown what effect the failure of the air bags in Fairchild's car will have on that competition.

[From Automotive News, May 29, 1972]

Air-Bag Exploders "Hazardous"

CLASSIFICATION ALSO APPLIES TO PRESSURE VESSELS

Washington.—New regulations for pressure vessels and explosive devices for air bags go into effect June 12, 1972.

The National Highway Traffic Safety Administration said it sees regulation of restraint systems such as air bags containing explosive materials or pressure vessels as having two primary functions: "To impose directly on manufacturers the obligation to conform to federal hazardous materials regulations, and to create a uniform system of regulation that will override any conflicting state or local regulation."

As issued, the regulation differs from the proposal made Oct. 9, 1971. Most of the comments received on this proposal agreed with its intent, NHTSA said, but found the fact that it incorporated all applicable portions of hazardous materials regulations "too vague and too likely to result in difficulties of interpretation."

It said this was true particularly in view of the Hazardous Materials Regulation Board's "practice of issuing special permits that allow shipment of regulated items that do not conform to the regulations."

Most devices used in occupant protection systems would have required one or more special permits and the new regulations take this into account by adopting only those parts of the HMRB regulations from which no variances have been granted.

NHTSA observed that "without exception, the pressure vessels used in air-bag systems to date have been manufactured in basic conformity" with current standards. Variances in choice of materials and methods of fabrication have necessitated special permits though "all cyclinders have been able to conform to the basic performance requirements." Under the new rules, manufacturers will be able to continue to make their present systems.

The HMRB will continue to exercise jurisdiction over shipment of the systems, so special permits will still be needed to ship systems that do not conform to the specification. HMRB test and inspection rules will have to be followed.

As adopted, the new rules have two sections, one dealing with pressurized vessels, the other with explosives. A pressure vessel that contains an explosive charge as well as gas under continuous pressure will have to conform to both.

NHTSA said that some of the hazardous materials shipment rules would not be appropriate for systems designed to protect vehicle occupants from the effects of a crash.

"The primary needs are for a requirement that sets limits on the sensitivity of the explosive and one that requires it to be in a container that will protect the occupants of the vehicle from the effects of inadvertent ignition," NHTSA said. "These requirements are hereby adopted, in accordance with comments made by General Motors."

The standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses. It requires pressure vessels to conform to specific rules, including absence of leakage and freedom from distortion.

It permits only certain modes of failure when hydrostatically tested to destruction and requires freedom from cracks when flattened.

All explosives in explosive devices must be enclosed in a structure capable of containing the explosive energy without sudden release of pressure, except through overpressure relief devices or parts designed to release the pressure during actuation.

U.S. DEPARTMENT OF TRANSPORTATION,
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION,
Washington, D.C., July 28, 1972.

HON. VANCE HARTKE,
Chairman, Subcommittee on Surface Transportation, Committee on Commerce, U.S. Senate, Washington, D.C.

DEAR SENATOR HARTKE: At the National Highway Traffic Safety Administrator's legislative and oversight hearings on July 19, you expressed a great deal of interest in the effectiveness of education and information as a means for modifying human behavior.

I think you might be interested in the attached article by a noted sociologist at Columbia. The article appeared in a recent issue of the *Saturday Review.*

Sincerely,

DOUGLAS W. TOMS, *Administrator.*

Enclosure.

HUMAN BEINGS ARE NOT VERY EASY TO CHANGE AFTER ALL

AN UNJOYFUL MESSAGE AND ITS IMPLICATIONS FOR SOCIAL PROGRAMS

(By Amitai Etzioni)

Amitai Etzioni is a professor of sociology at Columbia University and director of the Center for Policy Research.

A while back there was a severe shortage of electricity in New York City, and Columbia University tried to help out in two ways: A card reading "Save a watt" was placed on everyone's desk, and janitors removed some light bulbs from university corridors. The ways in which this shortage was made up for illustrate two major approaches to social problem solving. One approach is based on the assumption that people can be taught to change their habits, that they can learn to remember to switch off unused lights. The second approach assumes that people need not, or will not, change and instead alter their environment so that, even if they leave light switches on, watts are saved.

The prevalent approach in the treatment of our numerous and still-multiplying social problems is the first. Imbedded in the programs of the federal, state, and city governments and embraced almost instinctively by many citizens, especially liberal ones, is the assumption that, if you go out there and get the message across—persuade, propagandize, explain, campaign—people will change, that human beings are, ultimately, quite pliable. Both political leaders and the general public believe that advertising is powerful, that information campaigns work, and that an army of educators, counselors, or rehabilitation workers can achieve almost everything if they are sufficiently numerous, well trained, and richly endowed.

But can they? We have come of late to the realization that the pace of achievement in domestic programs ranges chiefly from the slow to the crablike—two steps backward for every one forward—and the suspicion is growing that there is something basically wrong with most of these programs. A nagging feeling persists that maybe something even more basic than the lack of funds or will is at stake. Consequently, social scientists like myself have begun to re-examine our core assumption that man can be taught almost anything and quite readily. We are now confronting the uncomfortable possibility that human beings are not very easily changed after all.

Take smoking, for instance. Since 1964, when the surgeon general began calling attention to the dangers of cigarettes, a vast and expensive campaign has been waged, involving press releases, lectures, television advertisements, pamphlets, and notations on the cigarette package. The positive result of all this activity, however, has been slight. At first there was no effect at all; actual cigarette smoking continued to rise until 1967. Then it dropped from 11.73 cigarettes per day per person aged eighteen years and over to 10.94 in 1969. More recently the level has risen again.

The moral? If you spend $27 million, you may get enough people to switch from Camels to Kools to make the investment worthwhile for the Kool manufacturers. However, if the same $27 million is used to make nonsmokers out of smokers—that is, to try to change a basic habit—no significant effect is to be expected. Advertising molds or teases our appetites, but it doesn't change basic tastes, values, or preferences. Try to advertise desegregation to racists,

world government to chauvinists, temperance to alcoholics, or—as we still do at the cost of $16 million a year—drug abstention to addicts, and see how far you get.

In fact, the mass media in general have proved to be ineffectual as tools for profoundly converting people. Studies have shown that persons are more likely to heed spouses, relatives, friends, and opinion leaders than broadcasted or printed words when it comes to deep concerns.

Another area in which efforts to remake people have proved glaringly inefficient is that of the rehabilitation of criminals. We rely heavily on re-educational programs for prisoners. But it is a matter of record that out of every two inmates released, one will be rearrested and returned to prison in short order. Of the 151,355 inmates in state prisons on December 31, 1960, there were 74,138, or 49 per cent, who had been committed at least once to adult penal institutions. Reformatories come off no better. A study of 694 offenders released by one well-known institution reports 58.4 per cent returned within five years. The study concludes self-assuringly: "But this is no worse than the national average."

What about longer, more sustained educational efforts? Mature people can be taught many things—speed reading, belly dancing, Serbo-Croatian—usually with much more pain, sweat, cost, time, and energy than most beginning pupils suspect. When we turn, though, to the modification of ingrown habits, of basic values, of personality traits, or of other deep-seated matters, the impact is usually much less noticeable.

What is becoming increasingly apparent is that to solve social problems by changing people is more expensive and usually less productive than approaches that accept people as they are and seek to mend not them but the circumstances around them. Just such a conclusion was implicit, for instance, in an important but widely ignored study of automobile safety done by the Department of Health, Education, and Welfare. Applying cost-effectiveness measurements to efforts to cut down the horrendous toll on American highways—59,220 Americans were killed in 1970—the HEW study noted that driver education saves lives at the cost of $88,000 per life. New automobile accessories, as simple as seat belts, proved more than a thousand times as effective; saving a life this way, it was computed, costs a mere $87. Yet we continue to stress driver education as the chief preventive measure; the laws regarding the redesign of autos are moderate in their requirements and are poorly enforced. Similarly, we exhort people not to drive while under the influence of liquor, even not to drink in excess to begin with. But these are rather monumental, perhaps impossible, educational missions. However, a simple device that measures the level of intoxication by breath analysis and that is widely used by highway patrols in Great Britain has tended to scare drunken drivers off the roads in that country. It could be applied to a rapid reduction of traffic fatalities in this country. Educate drinkers later.

The problem of educating against drug addiction in general offers parallel lessons. Acting on the belief that personality predispositions yield fairly rapidly to such approaches, we have tried a variety of informational, persuasive, personal, and group-therapeutic techniques in the battle against addiction. However, these approaches have rehabilitated only a few addicts. Much more promising are counter-drugs. For example, Antabuse, which if taken makes a person feel quite uncomfortable when he drinks, is more effective than psychotherapy in dealing with alcoholics. It takes so much less effort to decide each day to take medication than to decide, all the time, to refrain from drinking. True, Antabuse so far is a little-known remedy, and many who do know of it are skeptical, because early experiments in which a high dosage was administered seem to have resulted in some fatalities. Now, though, smaller dosages are being given, and Antabuse is slowly regaining serious consideration.

The failure of educational and therapeutic approaches to help most heroin addicts has led, finally, to the wide use of a substitute, methadone, which is usually referred to as a blocking drug because it is said to curb the craving for heroin. Let's not ask here if methadone is the most suitable drug for the purpose, to what extent it is different from heroin, or even if it actually blocks out heroin. For our purpose, it is sufficient to say that, unlike the educational and therapeutic approaches to heroin addiction, methadone is effective. That is, people taking methadone work, study, are satisfied, function as human beings and citizens, and have a much lower criminality record. Thus, of a group of 990 men carefully examined, those employed or attending school rose from 27 per cent at admission to the methadone program to 65 per cent after one year on the program, to 77 per cent after two years, and to 92 per cent in the third year. A

report by the director of the District of Columbia narcotics treatment division shows that as the number of addicts on methadone increased, the level of crimes that addicts tended to commit fell almost proportionally. Thus, with about 20 per cent of the addicts on such treatments, robberies in Washington, D.C., fell from 12,432 in 1969 to 11,222 in 1971. There is no evidence that any educational program has ever had such an effect.

Though there seem to be no similarly effective drugs to help food addicts (or persons afflicted with obesity), we have recently been informed by medical researchers that serious weight problems seem to arise, *not* from faulty will power, character, or motivation—qualities subject to educability—but from different rates of metabolism and divergent nutritional pathways. These pathways are established early in childhood and may be either set for life or altered by medication, but exhortation or other educational efforts can alter them little.

Again medication has proved to be more promising than education in dealing with mental patients. After year upon year of increase, the number of patients in mental hospitals declined sharply in 1956. This turning point came about, not because therapy was expanded or intensified or a new procedure found, but because tranquilizers were widely introduced. Most of those discharged now live on medications at home.

Technological devices and medication are not the sole approaches we may rely upon more heavily once we understand the limits of adult educability and allow ourselves to see the full extent and implications of these limits. Improved matching of persons and jobs may go a long way toward reducing the need for job training. Here the two alternative assumptions about the pliability and perfectibility of human nature come into sharp focus. Few educators are quite willing to assume, as it was once put rather extremely, that "given time and resources, we can make a piano player out of anybody." Yet whole job training programs are still based on such an assumption. For instance, the scores of training programs for the unemployed or the to-be-employed that are run or supported by the Department of Labor assume that people can be changed, and quite fundamentally.

The Department of Labor stresses, in its discussion of "social-psychological barriers" to employment, the need to modify "attitudes, aspirations, motivation (especially achievement motivation), ability or willingness to defer gratification, and self-image." And the 1968 Manpower Report suggests "the necessity of direct efforts to modify the attitudes of the disadvantaged before introducing them to job situations." One major training program aims at providing "needed communication skills, grooming and personal hygiene, the standards of behavior and performance generally expected by employers."

In a study I conducted with three of my colleagues for the Center for Policy Research, we found that persons have deep-seated preferences in their work behavior that are very difficult to change, and we concluded that it may be unethical to try to change them. Thus, if a person prefers to engage in nonroutine work of the more creative type, at an irregular pace, training him or her to be a "good" assembly-line worker—which entails teaching not only how to turn bolts but also how to be a more "uptight" person—may be both ineffective and morally dubious, especially if we are correct in suggesting that people's existing preferences can be readily analyzed so that they can be helped to choose jobs compatible with their personalities. It is also much less costly to test and assist people than it is to train and mold them. If we run out of compatible jobs, jobs may be changed to suit people rather than people to suit jobs.

One of the few effective and efficient ways in which people can be basically remade lies in a total and voluntary reconstruction of their social environment. Thus, when students withdraw from the campus into a rural commune, or Jews emigrate from the U.S.S.R. and Eastern Europe to found a new Israeli kibbutz, life can be deeply recast. The creation of a whole new environment for addicts—indeed, a new social community—on a voluntary basis, as achieved by Synanon, is highly effective, and Alcoholics Anonymous seems to provide a cure as effective as or better than Antabuse. Many alcoholics and mental patients who are integrated into therapeutic communities are reported to recover well.

This total-change approach is very appealing to a radical New Left perspective, which suggests that new persons cannot evolve except in a new society and that a new society will emerge only from the deep efforts of people in the crisis of reshaping their world. At the same time one must note that effective

total-change groups work only for those who join voluntarily. Most addicts, mental patients, prison inmates, and others in need of change don't volunteer to join. Hence, the total-change approach is considerably less applicable to social problems than some would have it be.

Much of what I have said is primarily concerned with adult educability. It also holds true, albeit to a lesser degree, for children. While children, especially younger ones, are more educable than adults—who must often first be disabused of the education they have acquired as youngsters—most Americans, both the general public and the policy-makers, still enormously overestimate what the education of children can achieve.

The schools, which are still the main institutions of education for children aged six through eighteen, cannot carry out many of the missions assigned to them. Most schools do not build character, open the mind, implant an appreciation of beauty, or otherwise serve as the greater humanizer or the social equalizer as educators would wish them to do. In desperation it is suggested now that the schools concentrate on teaching the three Rs, and it is common knowledge that they have a hard time doing even that.

Probably the greatest disappointment educators have encountered in recent years, and have not quite come to terms with, is the failure of intensive educational campaigns to help children from disadvantaged backgrounds catch up with their more advantaged peers. As has already been widely reported, virtually all of the 150-odd compensatory education schemes that have been tried either have not worked at all or have worked only marginally or only for a small proportion of the student population. The Coleman Report makes this point, and the same conclusion comes from another source. Professor Jesse Burkhead of Syracuse University found that differences in the achievements of high school students in large-city schools are almost completely conditioned by the students' social backgrounds and environments, including the incomes and occupations of the parents (class), housing conditions, and ethnicity.

The reasons for this inabiilty to bridge the distance between the educational achievements of disadvantaged and better off children are hotly debated. It seems to me that the key reason for the failure of compensatory education lies in the fact that the disadvantaged children are locked into total environments, which include home, neighborhood, parental poverty, discrimination, and inhibiting models of behavior. We cannot hope to change one without changing the others. Education will become more effective when it works together with other societal changes—which, of course, means that, by itself, it is not half so powerful as we often assume.

The contention that personal growth and societal changes are much harder to come by than we had assumed, especially via one version or another of the educationalist-enlightenment approach, is not a joyful message, but one whose full implications we must learn to accept before we can devise more effective social programs. Once we cease turning to ads, leaflets, counselors, or teachers for salvation, we may realize that more can be achieved by engineers, doctors, social movements, and public-interest groups; and the educators will find new and much-needed allies.

BETHESDA, MD., *July 26, 1972.*

Hon. Senator WARREN G. MAGNUSON,
Chairman, Senate Commerce Committee.

DEAR SENATOR: With great interest I am following your hearings on auto safety, and since I have been greatly interested in this important subject I am collecting source material for a publication about it. I have specifically refrained from a long statement and quoting the literature so that only the outstanding features should be mentioned at this time. It will be, of course, an honor to discuss the matter in detail with a designated person. In the meantime may I respectfully ask you to kindly include the attached notes in your Senate report.

Since 1970, after 22 years of active service, I have been retired from the US Public Health Service where, among others, I have devoted considerable time to the occupational safety of federal employees.

Wishing you continued success in your great endeavors and appreciating your kindness,

Respectfully,

J. J. WEISSKOPF.

Attachment:

In accordance with the "Highway Safety Act of 1966", with specific regard to para 402, /a/ to "reduce traffic accidents and death. . ." the following comments are respectfully submitted for consideration:

1. The staggering slaughter on the highways is to be considered a national epidemic and therefore attacked as such;
2. Enthusiastic apathy to this epidemic has produced unsatisfactory results so far;
3. Too much attention is being payed to a safe car without commensurate concern for a safe driver. The safest cars will be unsafe with bad drivers behind the wheel;
4. Alcohol and other drugs are involved in about half of the fatal accidents;
5. Driver education is not being provided enough extent, driver instruction given greater stress;
6. Enforcement of traffic laws and regulations is insufficient;
7. Not enough publicity is being provided of the tragic toll of life and limb due to traffic accidents caused in the vast majority by bad driving and not so much by unsafe cars;
8. There is considerable lack of coordination among respective federal, state, county, and local authorities;
9. Too much attention is being payed to "passive" restraints and not enough to "active" restraints comprising among others the duties and responsibilities of the driver; driving is a privilege and not a right;
10. Too little attention is being given to the "code of the road" by families, schools and the media.

In order to provide for a concerted attack on the massive public health problem created by the national (and international) epidemic of fatal and nonfatal highway accidents a NATIONAL INSTITUTE OF TRAFFIC SAFETY (NITS) should be created within the National Institutes of Health at the earliest date to coordinate *all* the functions prescribed by law to "reduce traffic accidents and death, injuries, and property damage resulting therefrom . . ." Similar to the National Communicable Disease Center it should be endowed with ample funds to accomplish the task of bringing this dangerous epidemic to an end.

NITS should, of course, cooperate, on a national as well as international level with all agencies concerned and provide, among others, specifically research in depth and other parameters pertaining to the personality of the driver and its impact on highway accidents.

RUBBER MANUFACTURERS ASSOCIATION,
New York, N.Y., August 3, 1972.

Hon. WARREN G. MAGNUSON,
Chairman, Committee on Commerce,
U.S. Senate,
Washington, D.C.

DEAR SENATOR MAGNUSON: The Rubber Manufacturers Association (RMA), in behalf of all domestic U.S. manufacturers of tires for motor vehicles, submits this statement for inclusion in the record of hearings on amendments to the Traffic and Motor Vehicle Safety Act held before the Senate Committee on Commerce in July 1972.

RMA's statement is directed to S. 2946, which would amend Section 113 of the National Traffic and Motor Vehicle Safety Act of 1966 (the Act) to provide that each defect notification issued by manufacturers of motor vehicles or motor vehicle equipment shall include a commitment to remedy the defect without charge.

RMA fully supports amendment of the Act to incorporate the safety objectives of S. 2946. We believe that motor vehicle equipment with safety-related defects should be removed from the road promptly and that users should be encouraged to present such equipment for remedy without economic burden or deterrent to them.

Consistent with these safety objectives, RMA recommends that S. 2946 be amended in one particular respect, as hereafter set forth, to help ensure that a tire with a safety-related defect will be presented for replacement as promptly as possible.

The overriding legislative intent of the Act, we believe, is that a safety-related defect be remedied quickly and effectively. To that end, a workable tire defect notification and replacement program must do two things: (1) provide individual notice by mail to the buyers of the tire, (2) encourage and induce prompt return of the tire for replacement.

An effective system for notification to buyers is now in place. By reason of the 1970 amendments of the Act, requiring record keeping of names and addresses of tire buyers, and subsequent DOT regulations, establishing a tire identification procedure, every tire produced since May 22, 1971 has molded on its sidewall an identification number that shows (1) the name of the manufacturer and the plant in which the tire was produced, (2) the size of the tire, (3) the type of the tire, and (4) the week and year in which the tire was produced. The RMA supported the 1970 amendments in testimony before the House Interstate and Foreign Commerce Committee. In this testimony, the RMA presented for the record a tire identification system and cooperated fully with the Department of Transportation in establishing the effective system now in use.

But even with an effective notification procedure now in place a workable tire recall program must still encourage the buyer to respond promptly to the defect notification he receives. S. 2946 aims at this result by giving the buyer an economic incentive to respond. However, in the unique case of tires, such economic incentive cuts two ways. The tire industry experience with defect notifications has shown that the unfortunate, though probable attitude of many consumers is that unless it can be amply demonstrated that the defect or compliance failure represents an immediate and serious threat to their safety, consumers will choose either to ignore the manufacturer's notice or to delay response to it until it may be convenient to do so or after they have exhausted practical use of the product.

Consumer response to manufacturers' press notices and defect notification letters have shown far greater concern for the convenience of continued use than for safety. If a consumer is told that he has a possibly defective tire, he may examine the tire and make an incorrect and hazardous layman's judgment: "The tire looks good. It has plently of tread left on it. I'll take my chances on it for a while. Maybe later I'll turn it in." No other component of a car lends itself to such easy examination and false judgment as a tire. Substantial tread depth may motivate the consumer to continue use of the tire or defer its return to the manufacturer for an extended period of time. Both actions would thwart the intent of the Act.

The new record keeping and direct notification requirements have improved consumer response to defect notification. However, even this increased response is inadequate in the area of highway safety. Under our amendment it is possible to go directly to the buyer and urge him to respond to the notice by establishing a deadline date after receipt of manufacturer notification by which time the tire must be presented for replacement without charge.

The experience of the domestic tire industry on responses to defect notifications indicates that a deadline date is essential to the goal of safety in the Act. Without the incentive provided by such a deadline, consumers will continue to make erroneous decisions on tire safety and defective tires will remain on vehicles. Sixty days would appear equitable to both parties from a statutory standpoint.

Unlike other items of motor equipment a defective tire cannot be "remedied" by mechanical adjustment or component replacement, but the whole tire must be replaced. Consequently, in the interest of highway safety the consumer should be required to return the tire within sixty days following receipt of notification in order to receive a free replacement. However, after the sixty-day statutory period, the owner would still be given an economic inducement to return the tire. This could be accomplished by allowing him to return the tire after sixty days, with a pro-rata adjustment based on the percentage of tread life.

Accordingly, in order to more fully accomplish the objectives of S. 2946 with respect to tires, the RMA recommends that a statutory limit be established for tire replacement without charge.

It is recommended that this be accomplished by the following amendment to S. 2946:

Add to Section 113(c) [line 3, p. 2] and to Section (g), (2), (B) [line 4, p. 3].

"In the case of tires, every manufacturer shall remedy any safety-related defect or failure to comply with safety requirements of applicable motor vehicle

safety standards without charge for the first sixty days following receipt of notification, and thereafter, on a pro-rata basis, based on percentage of tread wear."

We sincerely hope that your committee will favorably consider the adoption of this amendment.

Sincerely,

ROSS R. ORMSBY, *President.*

AUTO SAFETY RESEARCH CENTER,
UNIVERSITY OF MARYLAND,
College Park, Md., July 17, 1972.

Senator WARREN G. MAGNUSON,
127 Old Senate Office Building,
Washington, D.C.

DEAR SENATOR MAGNUSON: In response to your request for a statement on the National Traffic and Motor Vehicle Safety Act of 1966, we are submitting the enclosed testimony that was prepared by Auto Safety Research Center staff members, Robert B. Lederer and Fred M. Shelley, together with Center Coordinator Jonathan D. Libber. The Auto Safety Research Center is interested in many aspects of the auto safety/repair field, and if your committee should ever desire testimony in our areas of study, we would be grateful if contacted for further assistance.

Sincerely,

ROBERT B. LEDERER,
FRED M. SHELLEY,
JONATHAN D. LIBBER,
Coordinator, Auto Safety Research Center—College Park.

Enclosure.

STATEMENT OF THE AUTO SAFETY RESEARCH CENTER, COLLEGE PARK, MD.

The Auto Safety Research Center of College Park (mailing address: Box 127, University of Maryland, College Park, Md. 20742) is a consumer assistance group staffed by student volunteers at the University of Maryland. We are one of five such centers operating in the United States in affiliation with the Center for Auto Safety, Washington, D.C. The other four centers are located in Cleveland, Ohio; Akron, Ohio; Columbus, Ohio; and Hartford, Connecticut. Our organization has three main functions. The first is aiding consumers in the Washington area who are having difficulty obtaining service under their automobile warranty. The second is to compile statistics on the performance of local dealerships in providing warranty work. Periodically, we will publish these statistics in our newsletter in order to inform the public. The final function is to compile statistics on automobile defects by model to determine if any patterns of defects occur indicating that a particular type of car should be considered for recall.

Since its inception in December, 1971, the Center has handled over two hundred complaints. Through our experience over these last seven months, we have found that the present system of dealing with auto safety defects is in dire need of reform. Bill S. 2946, with some modification, could improve this situation immensely.

Robert B. Lederer and Fred M. Shelley, two staff members of the Auto Safety Research Center-College Park, together with Center Coordinator Jonathan D. Libber, prepared the following statement on the bill in response to a request for our views from Senator Warren Magnuson. This report contains an analysis of how people are harmed by the deficiencies in the present system, using as examples specific cases of consumer problems with which we have come in contact.

Presently, when either an automobile manufacturer or the National Highway Traffic Safety Administration (NHTSA) finds that certain types of cars have safety defects, consumers receive letters from the manufacturer that so inform them. The notification can either be voluntary on the manufacturer's part or mandatory, under authority of Section 113 of the National Traffic Safety and Motor Vehicle Safety Act of 1966. However, in either case, the manufacturer has no legal responsibility to pay for repairs to remedy the safety defect. The result of this discretionary authority is that in too many cases, the consumer is forced to foot the bill.

Under what circumstances do the manufacturers make the consumer pay for remedying safety defects? Depending on the situation, either of two excuses is given: (1) The car is out of warranty; or (2) the NHTSA-adjudged defect is not a defect but rather a result of poor maintenance.

The most notable example of the first explanation is the case of the 1965 through 1969 Chevrolet recall for defective motor mounts. NHTSA reported the seriousness of the problem:[1]

> Failure of the left front engine mount may result in partial rotation of the engine within the engine compartment, during acceleration. This . . . may, in some cases, jam the accelerator and gear shift linkages and may also cause loss of power braking and power steering assist. The result is partial or total loss of vehicle control.

Owners of these defective cars found to their dismay—and many have yet to find—that, as the NHTSA has reported,[2] "The cost of replacing engine mounts will be covered by the manufacturer *only* if the warranty still applies."[3] (emphasis added). (This policy has been the source of the most complaints to our center.) Yet, at the same time, NHTSA also reported that: "The manufacturer will bear the cost of corrective action on these vehicles, that is, installation of a cable device at both front engine mount locations." This may solve the safety problem for the consumer whose mounts break but still leaves those who have already suffered the problem and those whose mounts break with the restraint cable installed in the position of paying the bill to correct General Motors' mistake. General Motors will pay the cost of replacing the mounts themselves only for those few vehicles still under warranty. We believe that such a contradictory double standard is unfair and discriminatory.

On the other hand, Chevrolet used explanation No. 2 in the case of the 1961 through 1969 Corvairs which NHTSA determined to have defective heaters: The auto maker refused to pay for *any* defect remedies. (NHTSA had found dangerous carbon monoxide fumes leaking from the heater into the passenger compartment.) In the notification letter required by NHTSA, Chevrolet stated:

> Chevrolet dealers can provide all service required by you in the inspection and correction of any of the conditions referred to in this letter. Inspection and repair are maintenance items, and, like all other maintenance requirements, are the responsibility of the owner.[4]

As NHTSA Administrator Douglas Toms said at the time,[5] "The one thing GM refused to do was pay for repairs. We asked them to do that, but they were firm and there did not appear any way of changing them. It would be nice if we could get these Corvairs repaired free of cost to the consumer, but as I said, we don't have the authority."

From our experience, it has become apparent that the policy of forcing consumers to pay for auto safety defects is unfair to everyone—but even worse, it is financially burdensome to the lower-income consumer and very hazardous to car owners of all incomes. We will give examples of each problem.

First of all, the policy is simply unfair. Consumers rightfully believe that they should not have to pay for the manufacturer's mistakes. That car owners are

---

[1] DOT News, October 15, 1971, p. 1.

[2] NHTSA, "For Your Information: Chevrolet Motor Mounts", February 8, 1972.

[3] This exclusionary policy not only encompasses those cases where warranty coverage has run its course and ended, but also situations in which the second owner of a car has, for one reason or another, allowed the warranty to lapse.

Just such an unfortunate problem happened to Lester and Virginia Bagg, 10216 Edgewood Avenue, Silver Spring, Maryland 20901, who purchased a used 1968 Chevrolet Impala station wagon on March 31, 1971. At the time, they had not been informed of Chevrolet warranty provision which stated: "If second owner acquires car after 24/24 (24 months/24,000 miles) has expired, he may pick up what remains of the 5/50 for $25. Customer has 30 days or 1,000 miles to apply for transfer, otherwise it ceases." (FTC Staff Report on Automobile Warranties, 1968). On April 9, the motor mount on their car sheared, causing the brakes to fail and the gas pedal to jam open; between the first occurrence and repair, the same thing happened about five times. A few days later, the mount was replaced at Jack Amatucci Chevrolet, Wheaton, Md. There the Baggs were presented with a bill for $51.54, and were informed of the above-stated warranty provision. However, according to them, this $51 bill "left us no money to apply for the transfer." Unfortunately, by the time they were able to get the money and go to the dealer to apply, it was too late. Thus they had no way of being reimbursed for their repair bill.

In addition to this warranty provision, there is one stating that no warranty can be transferred to the third or subsequent owners who buy the car after the 24/24 coverage has expired. These restrictions demonstrate the wide range of usually unnoticed situations in which the consumer pays for repairs even though his car is still within the warranty period—but is not within the warranty itself.

[4] Letter from Chevrolet Motor Division to Corvair owners, December 1971, p. 3.

[5] Public statement, November 16, 1971.

concerned about this inequity is demonstrated by the many letters and calls we have received expressing anger at being forced to bear this responsibility and asking for our assistance in obtaining reimbursement. For example, we received a complaint from Thomas Garvey, 345 Stiemly Avenue, Glen Burnie, Maryland 21061, who owns a 1966 Chevrolet Caprice. His problems began in February 1972 with 42,000 miles on his car—well beyond the expiration of warranty on motor mounts. He tells his own story:

> I noticed my left front motor mount broken. I contacted Mr. Stanley at Gladding Chevrolet located in Glen Burnie, Maryland, and . . . he said he could do nothing about it unless I paid for the work. I had the mount changed . . . I want Chevrolet Division in Detroit to reimburse me in full for the charges ($21.36) to have the mount changed.

We knew it was unlikely that General Motors would comply with his request since his car was out of warranty. Nonetheless, we wrote the company to see what attitude they took on this matter. In a letter to us dated March 17, 1972, the Owner Relations Manager replied: "I am sure it is obvious that a great deal of thought was given to the matter of the motor mounts, and the position of GM and of our Chevrolet Division is clearly stated and fair to all concerned." Incredible it is, but GM is apparently not even distressed by the burden borne by consumers: it flatly asserts that its policy is without qualification "fair to all concerned".

But unfairness is only part of the story; for the lower-income consumers, the obligation to pay for repairing safety defects can be a severe financial burden. One such case—and there are many like this one—is that of Lynne Pine, 4857 Battery Lane, Bethesda, Maryland 20014, who owns a 1963 Corvair. In December of 1971, she received a safety notification letter from Chevrolet Motor Division (referred to earlier) which informed her that her heater was defective; that it could leak poisonous carbon monoxide fumes into the passenger compartment. As mentioned before, Chevrolet refused to pay for the necessary repairs to alleviate this problem. When informed of the possible exhorbitant cost (Administrator Toms has estimated it at $170), Mrs. Pine was very worried and said she "can't afford it." We told her she might want to sell the car, since it probably had market value of less than $500 (She was recently offered only $50 by a dealer), and thus further investment in repairs would be wasteful. She was understandably unhappy about this idea, as it would be extremely difficult to get more than scrap value for a car that had been widely publicized as a safety hazard. The result is that as of this time, she still has the car and has yet to replace the dangerous heater. Now she drives with the windows open in winter as well as summer; this is a serious problem due to Mrs. Pine's failing health. She has several medical problems, among them emphesyma, and has been in hospitals twenty-two times in the last few years. Thus, her defective car is causing her to expose herself to the risks of both carbon monoxide poisoning and added serious illness.

It is unlikely that Mrs. Pine's case is unique, since, as Ralph Nader has pointed out:[6] "The value of most of the 760,000 Corvairs remaining in service is less than $500 each, so that they are generally owned by people in lower economic brackets." These people are put in a dilemma: They can pay the $170 to replace the heater in a car which is probably worth less than $500; sell the car at a ridiculously low price due to the Corvair's bad reputation; or they can finally just drive the car as is, and hope that their health is not seriously damaged or destroyed.

Finally, there are many situations in which the consumer, regardless of income level, simply does not want to be bothered with making a repair if he must pay for it. Or, he is confused about who pays for what and how much is justified for the job (i.e., what is the going rate?), and thus spends valuable time trying to find these facts before taking action. In either case, the consumer allows a dangerous safety defect to remain in his car, making him vulnerable to extreme hazards. A good example of this confusion and uncertainty is the case of R. L. Smith, 12861 Travilah Road, Potomac, Md. 20854, who owns a 1965 Chevrolet Super Sports car. He reported a motor mount breakage to us in February 1972, saying, "Every so often the accelerator grabs by itself and the car rushes ahead (runs away from me)." He informed us that before replacing the mounts, he wanted to go around to several service departments to get estimates of the cost. This he did, and the estimates varied widely. Then, just before sending his letter to us, he read that Chevrolet would soon send out

[6] Press release, December 1971, p. 2.

recall notices which would include an offer to install restraining cables on the motor mounts without charge. Mr. Smith was confused about what to do, and he wrote us for advice. We told him that he should, of course, get the mounts replaced (necessarily at his own expense), and we informed him of the "going rate" for this operation. In the meanwhile, he received his recall notice and wrote Chevrolet, too, for advice. The company gave an unresponsive reply, so he wrote them again. All of this absorbed a good deal of time, during which he was driving a dangerously defective car.

Unfortunately, many consumers do not even go so far as did Mr. Smith; they don't even make inquiries. They figure that if the manufacturer is not going to pick up the tab, they might as well not get the car repaired at all. This is especially true with owners of older cars such as the Corvairs, in which, as previously mentioned, repairs would cost a large percentage of the actual value of the car. NHTSA statistics have confirmed the view that many people simply ignore recall notices. But as Administrator Toms has pointed out in reference to the Corvair recall, ". . . if GM's notification letter had included an offer to remedy the defect at no expense to the vehicle's owner, this would no doubt have increased the percentage of returns." [7]

It is clear then that S. 2946 is the solution to all of these problems. What it does, in effect, is to institute a government-guaranteed "backdrop warranty" for NHTSA-declared auto safety defects. This means that no matter what kind of warranty coverage, no matter how old the car, no matter what the cost of repairs, the manufacturer—and not the consumer—will have to remedy auto safety defects without charge. This requirement for the manufacturers to pay for their own mistakes will make the repair system more equitable, protect lower-income consumers, and eliminate confusion and doubt as to who must pay. Finally, the requirement that the manufacturer include in the safety notification his commitment to remedy the defect without charge will encourage many more consumers to go ahead and take their cars into the shop. This, then, will reduce the hazards resulting from auto defects.

While S. 2946 in its current form is a much needed bill, we believe it could be strengthened by three amendments which address some other problems we have encountered in connection with auto safety notifications and recalls.

1. The bill should clearly state that the manufacturer has an obligation to reimburse consumers retroactively any money they have paid for the correction of a safety defect which is *later* made the subject of a recall campaign.

Only if the law is extended to cover these situations can true equity be achieved. Consumers who pay for repairing their cars before a recall suffer all of the same harms as those who do so after a recall—if, as is usually the case, they are not reimbursed. We have received many complaints about defects that obviously relate to motor vehicle safety and thus could at any time be subject to recall. Just to give one example: James S. Cox, 6431 Lily-Dhu Lane, Falls Church, Va. 22044, owns a 1966 Volkswagen sedan. With about 26,800 miles on the car, in November 1971, the windshield wiper motor stopped running—the second time this had happened with a different motor, and a likely defect. Of course, he had to have it replaced. The bill for this was $35.97, which he had to pay himself since the car was out of warranty. As NHTSA has pointed out, windshield wiper failures in general "may be extremely hazardous to vehicle controllability and consequently to occupants' safety." If, as may yet occur, these cars are recalled at some time in the future, Mr. Cox would not necessarily be reimbursed for his repair expenses—unless the bill is amended in the way we have outlined.

A more direct example—one in which the car actually *was* recalled after repairs had been made—is the case of Ira Wilsker, 8421 Freyman Drive, Chevy Chase, Md. 20015, who owns a 1968 Chevy II. In January 1971 one of his motor mounts broke, knocking the engine out of place and causing much damage to internal parts of the transmission. Chevrolet reimbursed him for the repairs to the transmission, but he had to pay approximately $46 for engine realignment and new motor mounts. Then in March 1972 his car, like millions of others, was recalled for motor mount defects. However, the best he can get from Chevrolet are the restraining cables free of charge; he will not be reimbursed for the past repairs. And even under the bill as now written, it is not completely clear that he would be reimbursed since his expenses were in the *past, before* the recall. This is why specific language should be included to cover such situations.

---

[7] Statement before the Senate Surface Transportation Subcommittee, February 16, 1972. P. 3.

2. There should be a clause that in some way requires the manufacturer to furnish distributors with necessary repair parts within a reasonable time after the retail; perhaps that time could be specifically set in the bill. Coupled with this should be penalties for failure to meet the requirement.

These provisions are needed to remedy problems that many consumers have reported to us. One of the most common is a combination of inconvenience, time loss, and frustration, all resulting from delays in shipment of parts. An example of this is the case of Catherine S. Sedgewick, Box 610, Los Angeles, Cal. 90012, who owns a 1968 Camero. In late February 1972, she received a recall notice for motor mount defects. In a letter to Chevrolet headquarters, she tells the rest of her story, and makes a poignant comment:

> I immediately called the Warren Biggs Chevrolet dealer here in Los Angeles and was told that they had so many cars to take care of that I would have to make an appointment. This I did and a week later took it in the first thing in the morning only to be told that they could not take care of my car because they did not have the parts, did not know when they would have them, and that I would simply have to call in every day and see if the parts had arrived and bring it in then. That was on March 23rd and to date March 29 they still have not received the parts and still do not know when they will get them.
>
> My complaint is not against the Warren Biggs agency because obviously they can do nothing if they have no parts. My complaint is against the irresponsible attitude on the part of your company. It is bad enough to produce motor cars which are defective and dangerous to the people who buy them. But then to aggravate the situation further by upsetting the public with the news that the cars may be dangerous to drive, urging them to take care of the matter promptly, without providing the dealers with the parts necessary—that is almost a criminal action.

A more serious problem resulting from the parts shipment delay is the severe risk to the consumer in operating his car. One consumer, Charles M. Verts, 8219 Robey Avenue, Annandale, Va. 22003, told us of his narrow brush with disaster resulting from a parts delay. Again, we will let the consumer tell his own story:

> At the beginning of April 1972, I received my notice concerning defective motor mounts on my Chevrolet. I proceeded immediately to have this defect corrected but found that all of the Chevrolet dealers in my area were not supplied with the necessary part. . . . In any case I looked upon this matter as one of routine, as I was having no trouble with my car. On May 2, however, as I was driving, the motor mount broke causing the accelerator to stick.

Fortunately, there was no accident. But although Mr. Verts did then get the mounts replaced (of course at his own expense), he had been exposed to serious risks while waiting.

Of course, manufacturers cannot be expected to produce immediate results, but the past record has been far from satisfactory. Our Center frequently receives calls from frightened car owners who do not want to drive their defective cars, but have no alternate means of transportation. For the most part, we at the Center can do nothing for them.

3. The language that deals with the responsibility of the manufacturer to "cause such failure or defect to be remedied without charge" is unclear on the extent of that responsibility. The word "remedy" should be defined so that the consumer is assured a total and completed "remedy without charge". We suggest that such a definition include all three of the following obligations, to be fulfilled as applicable in each case:

> a. Installation of safety devices related to the defect, if such devices are sufficient to prevent hazards resulting from the defect without actually replacing the defective part.
>
> b. Replacement of the defective part (or, if salvagable, repair of the part).
>
> c. Adjustment, repair, or replacement, as necessary, of any other part of the car damaged because of the safety defect.

The following two hypothetical situations under the bill as presently drafted are examples of the need for the clarification outlined above. For the first case, suppose a consumer brings in his Chevrolet that has been recalled (but that still has unbroken motor mounts), and gets the restraining cable installed free of charge, as is present practice. Then suppose that some time later, the mounts break. Even though there is no longer a safety hazard (that is the cable's function: to prevent the engine from slipping out of place), the broken mounts still

must be replaced. Who would pay for this? Under the bill as written, Chevrolet could claim that it "remedied" the safety defect when it installed the cable, and thus the consumer must pay for any further repairs. The other example of this "gray area" would be a case similar to Ira Wilsker's, mentioned earlier, in which the breakage of the motor mount knocked the engine out of place. Under existing law, Mr. Wilsker not only paid for the new mounts but also for the necessary realignment of the engine. Suppose this situation happens to a consumer *after* the recall but *before* he has gotten the opportunity to have the cable installed. Again, the question is, Who would pay? Let us even suppose that this time GM is generous enough to install reinforced motor mounts (thus eliminating the need for cables) at no charge. Even so, under the bill's present wording, GM could still claim that it need not pay for the engine realignment, since free installation of new reinforced mounts is sufficient to meet the "remedy without charge" responsibility. These two examples, we believe, show the need for a clarifying definition of "remedy". Using the second motor mount case as an example, we will show what we mean by the proposed obligations in our amendment:

a=initial installation of the restraining cable
b=(later) replacement of the motor mount itself with the new, reinforced type
c=(at the same time as "b") realignment of the engine.

Throughout this report, we have demonstrated that time after time, when safety defects are discovered in autos, consumers end up paying the bill. Not only does this situation result in unfairness, financial burden, and exposure to severe safety hazards, but it also directly contradicts the will of Congress for maximum motor vehicle safety, as expressed in the National Traffic and Motor Vehicle Safety Act of 1966.

The time for corrective Congressional action is long overdue. This bill, along with the three amendments we have suggested, will go a long way towards taking the burden of safety defect repairs off of the consumer and returning it to the manufacturer where it belongs.

AMERICAN MOTORS CORP.,
Detroit, Mich., August 17, 1972.

MR. ED COHEN,
Counsel, U.S. Senate Commerce Committee,
Washington, D.C.

DEAR MR. COHEN: This letter is in response to your request for an American Motors' position relative to certain provisions of amendments to the National Traffic and Motor Vehicle Safety Act of 1966.

Specifically, we were asked to comment on three areas:

(1) The proposed amendment to the exemption provisions in Section 123 of the National Traffic and Motor Vehicle Safety Act of 1966.

The Administration proposed amendment would permit the NHTSA to grant temporary exemption to manufacturers that meet certain specific criteria. These exemptions would be allowed to remain in effect for a three year period and would apply to only those manufacturers whose total motor vehicle production is below 10,000 units annually.

The Automobile Importers of America have proposed an alternative amendment to this same section of the law which would eliminate the requirement that a manufacturer's total production be below 10,000 units but instead would have the 10,000 unit production limitation apply to only a specific class of vehicles. As proposed by the AIA, this would permit European manufacturers who produce large numbers of total units to obtain exemption from safety standards and to ship to the United States less than 10,000 units of a particular type car such as a sports car. American Motors understands the need for exemption authority to permit small manufacturers such as Checker Cab, Avanti and Stutz Motor Car Company, to be able to remain as producers of unique and different type of vehicles for which there is some limited demand. It was clearly the intent of the Congress to allow diversification of vehicle types and it is therefore essential that some exemption authority exist to permit these types of vehicles to be produced and sold in the U.S. market. To do so on an economically viable basis, it might not always be possible to meet all of the stringent requirements of the Safety Act and it might well be appropriate to permit such vehicles to be exempted from certain standards.

We also understand the desire of the European manufacturers to continue to sell limited numbers of sports cars in the U.S. market. The U.S. consumers want these cars and would be willing to accept them without such things as 5 MPH

bumper systems, or an air bag passive restraint system. We believe that the public deserves the right to be able to buy such cars. We, as a domestic manufacturer, however, believe that we also should have the right to produce unique types of vehicles in low volume that might appeal to certain market segments. For example, American Motors, in the recent past, considered the production in Europe of the AMX/3—a mid-ship engine sports car powered by an American Motors' engine. We believe that any exemption authority granted by NHTSA should permit American Motors to produce in Europe, the U.S., Canada, or any other place in the world, up to 10,000 units of a particular class of motor vehicle for sale in the United States market on the same basis that exemptions would be granted to Checker Cab and European or Japanese manufacturers. Should American Motors, down the road, desire to enter into the taxi business by developing a unique taxicab that would have an annual sales volume of less than 10,000 units, we believe that we should be permitted to manufacture and sell those vehicles in the same manner that Checker Cab would be granted their exemption.

In summary, American Motors supports the AIA version of the amendment to Section 123 and not the Administration's version for the reasons outlined above.

2. We were asked to comment on the language in the proposed amendments to Section 123 concerning the granting of temporary exemption to facilitate development of vehicles utilizing a propulsion system other than or supplementing an internal combustion engine or to promote the development of new motor vehicle emission control features. We are in agreement with this part of the proposed amendment in the AIA version as this would permit manufacturers to experiment with alternative propulsion systems such as battery powered vehicles, etc., without having to concurrently undertake the crash worthiness program to insure that these battery powered cars will meet all of the safety requirements. As long as the total volume of such a vehicle is low, that is below 10,000 units per year, we see no reason to require the manufacturer to undertake a prohibitively expensive barrier crash test program to insure the vehicle meets all of the safety requirements. However, if and when such vehicles become a viable entry in the U.S. market, we would expect that they would meet all of the applicable safety laws. American Motors favors the AIA version because it does not limit this exemption to manufacturers whose total production is less than 10,000.

3. We were asked to comment on the urban use language of the Automobile Importers Association proposal.

We believe that the classification of vehicles is a very complex matter and before we can comment on "a motor vehicle designed for urban use", we would suggest that a complete careful study be undertaken to carefully define what an urban vehicle is. Therefore, at this time we cannot support the language. ". . . and, in particular, one designed for urban use.", in the proposed AIA amendment.

Should you have any further questions on any of these points, please feel free to contact me.

Sincerely,

H. M. SIEGEL,
Director, Vehicle Safety Programing.

Enclosure.

STATEMENT OF FREDERICK A. STEWART, VICE PRESIDENT OF SAFETY AND RELIABILITY FOR AMERICAN MOTORS CORP.

I would like to thank the Committee on behalf of American Motors for this opportunity to meet with you to discuss the subject of phasing in motor vehicle safety standards. American Motors has been made aware of the fact that the Secretary of Transportation has proposed an amendment to the National Traffic and Motor Vehicle Safety Act for the purpose of establishing the authority to phase into production certain safety standards that, by their nature and complexity would entail substantial startup problems for the automotive industry.

This proposed amendment has three sections as follows:

The first would authorize the National Highway Traffic Safety Administration to specify a series of effective dates for future motor vehicle safety standards when such a standard meets criteria of the need for an orderly phase-in over a two year period. The second section seeks to establish effective dates at six month intervals over this two year period at which time a percentage of a manufacturer's total production volume must comply. The third section defines a manufacturer's total volume to include the volume of wholly owned subsidiary companies.

In principle, American Motors supports the basic idea behind the proposed amendment. We agree that it is desirable and, in fact, necessary to time phase the introduction of some safety standards in order to coincide with new model tool cycles and thus more nearly fulfilling the requirements of the Act that standards be "reasonable, practicable and appropriate." For example, passive restraint requirements of Standard 208 which are now required for all vehicles effective with August 15, 1975 production would be very difficult to accomplish, assuming the basic technological and reliability problems are solved, without the manufacturers themselves undertaking a time phased program to introduce the devices into their various car lines at staggered effective dates.

Our current program efforts are directed toward solving the problems of passive restraint systems for each of our major car lines on a one car line at a time basis. We cannot do otherwise with our available manpower and resources.

In our 1974 model year we plan to rush an in-house passive restraint fleet in one of our car lines.

In the 1975 model year we plan to offer as an option only the front seat passive restraint system in one of our car lines.

In addition, in the 1975 model year we plan to run in-house fleet programs in our remaining car lines.

In view of the August 15, 1975 deadline we must find the wherewithal to run in-house fleets in all car lines that we will be producing in the 1976 model year. This is a major undertaking for American Motors and relief such as that proposed by the Administration by possibly allowing a time phase introduction over two years starting with August 15, 1975 would be in the interest of providing an orderly phase-in to production. This would be in the interest of all concerned, particularly the consumer. For this reason we strongly support the basic intent of the proposed amendment to the safety Act.

American Motors is gravely concerned, however, for the possible effects the proposed legislation would have on our competitive posture in the market place. The implementation of the "phase in" of effectivity of a safety standard by the proposed method of applying a percentage to a manufacturer's total volume will impose a serious competitive disadvantage on American Motors.

As you gentlemen know, American Motors is the smallest of the major domestic automobile manufacturers. Our production consists of four car lines by nameplate or model designation and three lines of Jeep four-wheel drive multipurpose passenger vehicles and a line of Jeep four-wheel drive light pick-up trucks. Our total volume for the 1972 model year consisted of 305,000 passenger cars and 53,000 Jeep vehicles.

The most significant characteristic of American Motors' production volume in relation to the proposal under consideration is that it is heavily concentrated in the small size economy price segments of the market. For example, we have no large, high price, so-called luxury cars in our passenger car lines such as the Cadillac, Imperial or Continental. We also have no entries in the medium price, full size market segment. The top of our line, the Ambassador, is a relatively low volume, full size car competing directly with the full size Plymouth, Ford and Chevrolet from the other major domestic manufacturers. Our other models proceed downward through the intermediate, compact and sub-compact segments from there.

It has been traditional in the industry that the introduction of new more costly innovations or devices have been introduced, or "phased in," on the higher priced luxury cars first and only later finding their way into the lower priced cars perhaps as extra cost options on a progressive basis down through the spectrum of models and price classes. The primary reason for this is due to the high degree of price sensitivity in the lower price car lines as contrasted with higher price car lines. In addition, this approach permits refinement of manufacturing processes and engineering designs for optimum cost effectiveness prior to introduction into the lower price car lines. We have every reason to believe that this practice will and should continue.

If "phase in" quantities would be determined as a percentage of each manufacturer's total volume as proposed, with no regard for price class problems, then it should be apparent that American Motors would be at a serious competitive disadvantage by virtue of being required to incorporate high cost safety features in lower price models as much as eighteen months ahead of some other manufacturers. The demands on our technical capabilities to lead the rest of the industry is a matter of serious concern, but more importantly, we believe the resulting handicap of having our comparable models carrying a higher retail price tag than our competitors would be insurmountable.

As written, the amendment would enable the National Highway Traffic Safety Administration to require that all manufacturers equip a certain percentage of their cars, ignoring price class senitivities between producers, in accordance with a federal safety standard with increasing percentages until all cars complied by the end of a two-year period. Using passive restraints as an example, the National Highway Traffic Safety Administration could, for example, require that by:

August 15, 1975, 20% of the vehicles produced by each manufacturer be so equipped.

Six months later on February 1976 that percentage could be increased to 40%;

Six months later, at the start of production of the 1977 model year, on August 15, 1976, that percentage could be increased to 60%;

And then six months later, February 15, 1977 the percentage could be increased to 80%;

And finally by August 15, 1977, the start of 1978 model production, all manufacturers could be required to have passive restraint systems in all of their cars.

On the surface this sounds reasonable and in line with our needs with respect to spreading work loads in our engineering and manufacturing areas. However, those percentages would prove to be an economic hardship for American Motors customers.

I would like to invite your attention to the attached chart (Exhibit I). This chart represents, by domestic manufacturer, the 1972 model year to date sales by vehicle marketing classifications. You will note that we have identified seven different vehicle classifications.

There are the subcompacts which include our Gremlin, the Vega, the Pinto, the Cricket, and the Colt. (Although we don't show it, the imports are also heavily represented in this segment.)

There are the compacts which include American Motors' Hornet, the Maverick, the Comet, the Nova, the Pontiac Ventura, the Plymouth Valiant Duster, and the Dodge Dart Demon.

There is the sporty compact classification which includes our Javelin, our Javelin/AMX, the Camaro, the Firebird, the Mustang, the Cougar, the Barracuda, and the Challenger.

There is the intermediate classification which includes American Motors' Matador, the Ford Torino, the Mercury Montego, the Chevelle, the Monte Carlo, the LeMans, the Cutlass, the Skylark, the Plymouth Satellite and the Dodge Coronet and Charger.

In the next segment are the standard cars including the American Motors' Ambassador, full-size Ford, Chevrolet, and Plymouth Fury.

The next two classifications in which American Motors is not represented are the medium price cars whcih includes the Buick, Chrysler, full-size Dodge, Mercury, Oldsmobile, Pontiac, and Thunderbird.

The last classification is the luxury class including the Cadillac, Lincoln, and Imperial.

As you will note on the chart we have shown how each company's domestic sales are split between these vehicle classifications. These classifications, incidentally, are generally used and accepted by the manufacturers and by others who report industry sales data.

The chart shows four horizontal lines running through all manufacturers. These lines are at the 20%, 40% 60% and 80% levels. You will note that at 20%, American Motors would be required to equip all our standard size vehicles—the Ambassador, and part of our intermediate vehicles—the Matador, in order to reach 20% of production volume. At General Motors, 20% can be achieved by equipping all of their luxury cars and approximately half of their medium priced cars with the same safety device, and at Ford and Chrysler there is a similar situation.

At 40%, American Motors must equip all of our standard, intermediate, sporty compacts and even some compact vehicles while General Motors at that level is just getting into a part of their standard size cars. You will note that at General Motors they would not have to include but a small percentage of their intermediate vehicles until the 80% step is reached. You will recall that we explained that the 80% might not occur until February 15, 1977, thus, for one and one-half years our Matador car line would have to compete in the marketplace with a passive restraint system and its inherent high cost penalties against the formidable competition of General Motors' intermediate entries that would not have to have that same expensive equipment.

Our Hornet car line competing in a highly price sensitive segment would be required to have a substantial number of installations as early as February 15, 1976, whereas, General Motors would not have to be effective in their Nova and Pontiac Ventura until the 1978 model year.

I'm sure that the members of this committee can appreciate how unfair this would be to American Motors, its customers, suppliers, employees and dealers. We would have to prematurely raise prices to recover the cost of safety devices and run the risk of not selling cars because of the non-competitive price or so equip the cars without recovering the cost of the device in our pricing if we are to remain competitive. Either alternative is a severe economic hardship. We believe that the National Highway Traffic Safety Administration and the Secretary of Transportation did not intend to create additional hardships for an automobile company like American Motors when they proposed this amendment to the Safety Act.

Are there any alternatives to the proposed legislation which would ease the lead time problems of industry in meeting the more complex and expensive requirements of future safety standards? We believe there are.

Sec. 103(c) of the National Traffic and Motor Vehicle Safety Act provides that the Secretary shall specify an effective date * * * not sooner than one-hundred and eighty days or later than one year from the date such order is issued, unless the Secretary finds, for good cause shown, that an earlier or later effective date is in the public interest, and publishes his reasons for such finding.

Under this provision, the Secretary may establish an effective date more than one year from the date a standard is issued.

The present legislation also provides in Sec. 103(f)(3) as follows:

In prescribing standards under this section, the Secretary shall . . . consider whether any such proposed standard is reasonable, practicable and appropriate for the particular type of motor vehicle or item vehicle equipment for which it is prescribed.

This section of the National Traffic and Motor Safety Act recognizes the necessity of classifying vehicles into "particular" types and charges the Secretary with the obligation of determining the practicability of applying a standard to the type of motor vehicle involved. Vehicles have already been classified as passenger cars, multipurpose passenger vehicles, trucks, and buses. Each class has certain standards which are designed to recognize the unique characteristics of that vehicle and which do not apply to other vehicles. The Secretary has also distinguished between classes of vehicles strictly on a basis of effective date of the standards.

There is nothing that would prevent the Secretary from further breaking down the classification of passenger vehicles into subclassifications and assigning such sub-classifications different effective dates for future safety standards. The Secretary has made such sub-classifications in the truck classification and has issued standards which may differ in application to trucks, depending on their weight sub-classification.

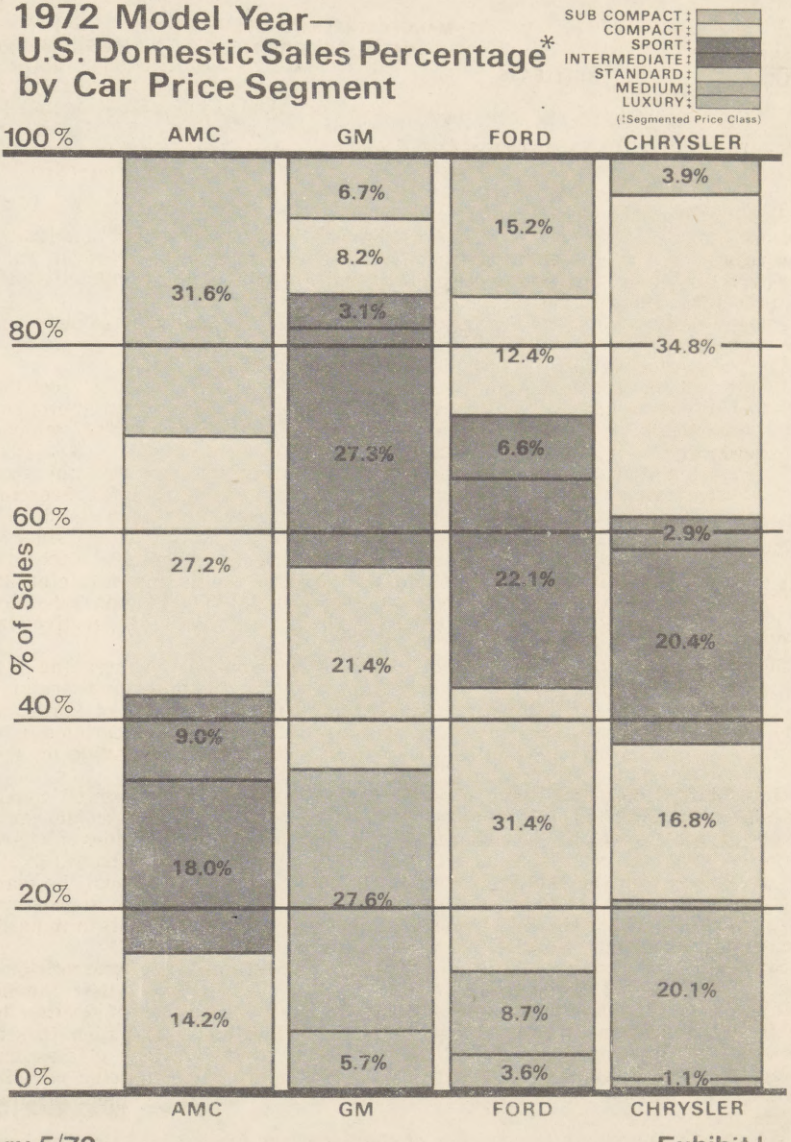
One might think of vehicle classification other than the accepted market price-segments we have chosen to use on the referenced chart. For example, vehicle prices or vehicle weight, wheelbase, overall length or other significant characteristics have been suggested as criteria. As shown on the next chart (Exhibit II) we have listed the vehicles within each of the groups and shown the manufacturer's suggested retail price range within each car line and the approximate curb weight range for the 1972 models. While these approaches contain imperfections, they should not be ruled out without further study.

Since the underlying issue is one of insuring continued fair competition in each of the market segments, American Motors has concluded that the best solution is for the Administrator to define, under the authority of Section 103, vehicle classifications such as illustrated in our Exhibit I, and then to set a series of effective dates after which all vehicles in the various classes must comply with a particular standard. This would place all competing car lines on an equal market footing at the same time and avoid the problem discussed earlier.

We greatly appreciate the concern of the Secretary for the lead time problems faced in industry in meeting complex standards and we support his action in bringing this matter to your attention. We feel, however, that the proposed legislation in its present form would create more problems than it would solve and may well create a great and serious competitive disadvantage for American Motor Corporation. We suggest that alternative solutions available under the present statute have not been exhausted and request that this Committee and the Secretary re-examine those alternatives in light of these comments.

American Motors recommends this course of action and thus is opposed to the adoption of the proposed Bill to amend the National Traffic and Motor Vehicle Safety Act.

Mr. Chairman, we thank you again for the opportunity of appearing before you and expressing our very real and present concern on the effect of the proposed legislation.



*Thru 5/72

Exhibit I

1972 Model Year
Segment Comparison
Series By: Wheelbase · Price · Weight

EXHIBIT II

SEGMENT / SERIES	WHEELBASE	MANUFACTURER'S SUGGESTED RETAIL PRICE RANGE		CURB WEIGHT RANGE (ROUNDED)	
SUB-COMPACT (Segmented Price Class)					
PINTO	94"	$1960.	$2265.	2000	2375
VEGA	97"	2160.	2284.	2200	2400
GREMLIN	96"	2021.		2600	2900
CRICKET	98"	2010.	2017.	N/A	N/A
COLT	95.3"	2095.	2451.	N/A	N/A
		AVG.@ $2049.	$2254.	AVG.@ 2266	2558
		(MEAN AVG. $2151.)		(MEAN AVG. 2412)	
COMPACT (Segmented Price Class)					
HORNET	108"	$2199.	$2587.	2700	3000
VAL/DUSTER	108"	2287.	2648.	2900	3200
DART/DEMON	108"	2373.	2694.	2900	3000
MAVERICK	103"*	2190.	2519.	2700	3000
COMET	103"*	2232.	2448.	2700	3000
NOVA	111"	2350.	2468.	3000	3200
VENTURA	111"	2426.	2454.	3000	3200
		AVG.@ $2294.	$2545.	AVG.@ 2843	3086
		(MEAN AVG. $2420.)		(MEAN AVG. 2965)	
SPORT COMPACT (Segmented Price Class)					
JAV./AMX	110"	$2807.	$3109.	3000	3300
B'CUDA	108"	2710.	2953.	3100	3400
CHALLENGER	110"	2790.	3068.	3200	3300
MUSTANG	109"	2729.	3101.	3100	3300
COUGAR	112"	3066.	3597.	3500	3600
CAMARO	108"	2730.	2820.	3200	3300
FIREBIRD	108"	2837.	4256.	3200	3400
		AVG.@ $2810.	$3272.	AVG.@ 3186	3371
		(MEAN AVG. $3041.)		(MEAN AVG. 3279)	

*4 DR. @ 109

1972 Model Year
Segment Comparison
Series By: Wheelbase · Price · Weight

EXHIBIT II

SEGMENT / SERIES	WHEELBASE	MANUFACTURER'S SUGGESTED RETAIL PRICE RANGE		CURB WEIGHT (ROUNDED)	
INTERMEDIATE (Segmented Price Class)					
MATADOR	118"	$2784.	$2818.	3300	3800
SATELLITE	115"	2609.	3418.	3300	3700
CORONET/CHARGER	115"	2721.	3683.	3400	4000
TORINO	114-118"	2641.	3486.	3600	4100
MONTEGO	114"	2731.	3438.	3600	4200
CHEVELLE	112-116"	2669.	3538.	3300	3900
MONTE CARLO	116"	3361.		3600	
LEMANS	112-116"	2721.	3378.	3300	4100
CUTLASS	112-116"	2958.	3433.	3500	4300
SKYLARK	112-116"	2925.	3443.	3600	4100
		AVG.@ $2812.	$3404.	AVG.@ 3450	4000
		(MEAN AVG. $3108.)		(MEAN AVG. 3725)	
STANDARD (Segmented Price Class)					
AMBASSADOR	122"	$3885.	$4437.	3600	3900
FURY	120-122"	3211.	4079.	3900	4500
FORD	121"	3262.	4318.	4000	4500
CHEVROLET	121"	3073.	4423.	4000	5000
		AVG.@ $3358.	$4314.	AVG.@ 3875	4475
		(MEAN AVG. $3836.)		(MEAN AVG. 4175)	
MEDIUM (Segmented Price Class)					
BUICK	124-127"	$3958.	$5149.	4300	5200
CHRYSLER	124-127"	4035.	5334.	4200	5100
DODGE	122"	3379.	4723.	3900	4600
MERCURY	121-124"	3809.	5034.	4200	4700
OLDSMOBILE	124-127"	3774.	5341.	4300	5200
PONTIAC	123-127"	3713.	4472.	4300	5100
THUNDERBIRD	120.4"	5293.		4500	
		AVG.@ $3994.	$5009.	AVG.@ 4243	4983
		(MEAN AVG. $4502.)		(MEAN AVG. 4613)	
LUXURY (Segmented Price Class)					
CADILLAC	130-151"	$5771.	$11,880.	4200	5800
LINCOLN	120-127"	7068.	8640.	5000	5100
IMPERIAL	127"	6534.	6762.	4900	5100
		AVG.@ $6458.	$9094.	AVG.@ 4700	5333
		(MEAN AVG. $7776.)		(MEAN AVG. 5016)	

STATEMENT OF C. ROBERT WEIR, CHAIRMAN QUALITY ASSURANCE COMMITTEE AND HERBERT R. HERINGTON MTI EXECUTIVE SECRETARY

You have in your possession a report of a study commissioned by the Metal Treating Institute to the University of Michigan. The study was prepared by Bradford Stone, Professor of Law, and is entitled, *Product Recall and Consequential Damages; Effects of Motor Vehicle Safety Act of 1966.*

Professor Stone's thorough examination concluded that even though this legislation required only the sending of a notice of a possible safety defect to a car buyer and did not mandate a recall based thereon, the practical effect in most cases was to induce such a recall. Proposed legislation will doubtless require such recall campaigns because it would appear to empower the Secretary of Transportation, if he so chooses, to order the auto manufacturer to recall after appropriate evidence of the need is presented to him.

The problem of dealing with the cost of a mandatory recall would be relatively simple if the auto manufacturer of the recalled article also produced all of the components included in its assembly. The auto manufacturer, would, as he doubtless does now, add the cost of such recall campaigns to his sales price, and, unless his experience were groosly out of line with his competitors, he would collect all such costs from the buyers of future production. If, however, the component part which triggered the recall was manufactured or processed by a subcontracting supplier, a new series of problems ensues.

It is estimated that 30 to 50% of the component parts of an automobile are manufactured by outside, subcontracting suppliers. Professor Stone's supplementary report entitled "Legislative Proposal Regarding Allocation of Risk for Product Recall Expenditures" provides an example of a realistic case in which a 50,000 car recall could cost an auto manufacturer some $570,000.00 in recall costs. If the automobile manufacturer had a $200.00 per car profit, he would have lost 5.7% of that profit.

If the component which failed had been purchased from a subcontracting supplier, its manufacturer, assuming the auto company chose to sue him or invoke its purchase contract terms, could be liable for an amount thousands of times greater than his expected profit. The component part manufacturer, in turn, would doubtless sue the heat treater, if such services were bought outside, for his consequential damages. In Professor Stone's example this could result in a liability as much as 50,000 times the heat treater's expectation of profit. At any rate, the exposure is potentially disastrous especially when it is known that recall campaigns costing many millions of dollars have already occurred.

In fairness to the auto industry, experience indicates an exhaustive effort to locate and correct the source of safety defects and some lost business discipline meted out to involved part suppliers, but to date the Metal Treating Institute does not know of a recall campaign cost passed on to a small supplier. Whether such costs can now be passed on is not completely clear, but Professor Stone suggests they could be.

The potential liability arises from the large company's bargaining power as to indemnification language in their purchase agreement. This language as shown in Professor Stone's study, in effect binds the supplier to produce zero defects or to pay for the consequences. When it is realized that many products use sophisticated metallurgical processing to make them possible and that much of such processing is not subject to verification except by destructive testing of the processed part, one can understand that no manufacturer using such processing can truly know the exact nature of his end product. He must resort to sampling plans which can only statistically infer but not prove that all parts are good and useful. After all a 1/10 of 1% level of bad parts in a lot of 100,000 could mean 100 failures in service. A fraction of that number would doubtless trigger a recall.

It should be noted here that members of the Metal Treating Institute perform metallurgical processing for a wide variety of industries; and to the extent that consumer legislation provides recall procedures for products of any of these, they face the same kind of problem but varying only by degree.

The Institute has learned that its members cannot purchase and that there is no market for product recall insurance of sufficient scope or policy limits to offer real protection.

The Institute has learned that its members cannot reduce their taxable earnings by reserves established to meet a recall contingency.

The Institute has learned that even if we were able to accumulate reserves after taxes, these would in most cases be subject to attack as unreasonable accumulation.

In short, we must presently rely on our larger customers to exercise restraint in passing on such costs—a restraint which we fear some large corporation stockholders will not condone or understand. Other obvious pressures could develop in the purchasing department of large buyers to order parts only from those suppliers able to indemnify the buyer against losses resulting from product recall. Carried to a logical conclusion, many more kinds of business could become effectively closed to small or even moderate-sized firms. It would also seem possible that still other pressures will develop to move critical part manufacture "in house" because financially "responsible" suppliers cannot be found.

Professor Stone's supplementary report mentioned above suggests several methods of allocating or limiting liabilities among the parties on a formula basis. A rationale for part of this presumably came from The Napoleanic Code which used the expectation of profit as a basis for such allocations. One of the most simple and strightforward of these would limit supplier liability to some multiple of his profit expectation on the lot in contention—perhaps even as much as 100 times such profits would not be unreasonable. Most of these formulae could establish an insurance basis which might attract private companies into the marketplace.

Other possibilities include a government supplied or sponsored market for insurance and perhaps government standards covering the production and metallurgical processing of critical parts. Presumably compliance with the standard would be needed to keep insurance in force and thus provide indemnification where strict liability can be shown. The fact that private insurance cannot now be bought is clear indication of the unknown magnitude of this problem, a gamble which even the famous Lloyds of London will not presently undertake.

In conclusion, we believe it prudent to suggest an attempt to address this problem before there is some catastrophic business failure (resulting from a product recall campaign) with the attendant personal loss of jobs and income. Doubtless several of these would raise a clamor from owners, stockholders, employees and their unions to do something.

Perhaps just one of the possibilities we've suggested above would do the job without seriously reducing competition or diligence in attempting to gain advantage by producing better goods more economically, and at the same time would implement a wise public policy which seeks to protect small businesses to the public's ultimate advantage.

STATEMENT OF DONALD A. OLSON, DIRECTOR, TIRE SAFETY REGISTRY, A DIVISION OF AXICOM SYSTEMS, INC.

The Tire Identification and Recordkeeping regulation, Part 574 (49 C.F.R. 574) was enacted by the National Highway Traffic Safety Administration (NHTSA) so as to facilitate notification to purchasers of defective or nonconforming tires, pursuant to section 113 of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1402) in order that they may take appropriate action in the interest of motor vehicle safety. Part 574 became effective May 22, 1971. Under § 574.8 of the regulation, Tire Safety Registry (TSR) has been named by a number of tire manufacturers and brand name owners as their recordkeeping "designee". In this position TSR is able to determine the degree of recordkeeping compliance with the regulation since the manufacturers provide the information on annual tire production and the approximate number of dealers. Thus, after more than a year of effectiveness of the regulation, TSR can report the following:

(*a*) Less than 10% of its customers' dealers are registering tire sales.

(*b*) Less than 25% of the tires produced by its customers and sold to their dealers are being registered.

(*c*) There is less compliance with the regulation now than there was six months ago which would indicate that dealers who were complying have given up because their competitors are not complying and there appears to be no enforcement.

These results are disturbing and, therefore, are believed to be of concern to this Committee. Being cognizant of them TSR has aggressively tried to increase tire registration by:

(*a*) Alerting manufacturers to low participation levels (a monthly TSR activity report shows each manufacturer his dealers' participation).

(*b*) Preparing compliance letters for manufacturers to send to their dealers and providing printed copies.

(*c*) Making available to dealers a low-cost combination invoice/registration form designed to reduce the writing required of the dealer when making a tire sale.

(*d*) Assigning Dealer Identification Numbers (ID) designed to simplify the registration process for the dealer. (TSR has assigned over 16,000 Dealer ID's.)

In January 1972 TSR had inserted in NHTSA Docket No. 7–12 its program for increasing tire registrations, improving the quality, etc., plus recommendations to NHTSA for obtaining improved compliance with the regulation. A copy of this filing is attached hereto.

If motor vehicle safety is to be achieved with respect to the elimination of defective and nonconforming tires, recordkeeping of tire sales must be increased. To date we know of no way in which NHTSA has undertaken to assure compliance with its regulation other than a rather general statement made in a speech last September by its Compliance Director. This is not enough. Continued lack of more affirmative steps in NHTSA to increase compliance will only result in further deteriorating an ineffectual program.

PROGRAM OF TIRE SAFETY REGISTRY WITH RESPECT TO TIRE REGISTRATIONS

I. TSR ACTIONS TO INCREASE THE TIRE REGISTRATION OF OUR CLIENTS AND THEIR DEALERS

A. In November we conducted a detailed review of our client's activity reports. We found some of the clients had no activity for October and a number had very low dealer activity based on the number of dealers they service. We sent letters to the dealers with the details. (See enclosures #1 and #2)

B. In paragraph 4 of enclosure #2 TSR offered to preassign dealer identification numbers (ID's) if the names and addresses were provided. (Under our system we normally assign numbers upon the receipt of the first registrations.) (See enclosure #3, paragraph G)

C. TSR has designed a combination invoice-tire registration form for tire dealers. (See enclosure #4.) This form reduces the paper work required and generally simplifies tire registration. Several thousand sample forms have been sent to tire retailers to determine their interest. (See enclosures #5 and #6)

D. Upon their request, we have provided some of our clients with form letters to send to their dealers to stimulate increased registrations.

II. TSR ACTIONS TO IMPROVE THE QUALITY OF TIRE REGISTRATIONS

A. Invalid registrations received since the start of the program have been returned to dealers for review and/or correction. (See enclosure #7)

B. Although we originally issued detailed registration form preparation instructions (see enclosure #3) to our clients for distribution to their dealers, we have just issued a new condensed instruction (see enclosure #8) which we enclose with all new dealer ID assignments.

III. TSR IS TAKING THE FOLLOWING ADDITIONAL ACTIONS TO INCREASE REGISTRATIONS

A. On all new dealer ID assignment forms we are printing a warning on non-registration. (See enclosure #9)

B. Every other month we will make a detailed review of activity and notification of clients as mentioned in paragraph I above.

IV. TSR RESPECTFULLY RECOMMENDS THAT IN VIEW OF THE STATUS OF TIRE RECORDKEEPING REPRESENTED BY OUR STATISTICS THAT DOT CONSIDER THE FOLLOWING:

A. Launch a strong public information program aimed at the general public.
B. Promptly develop actions based on November 11, 1971, hearings.
C. Launch a nation-wide dealer compliance program.

ENCLOSURE NO. 1

TIRE SAFETY REGISTRY,
Paramus, N.J., November 29, 1971.

We have just completed a review of the tire recordkeeping Activities Reports and find that no registrations were received from you or your dealers during October.

In order to assure ourselves that registrations are not going astray, we suggest you review your operations and question your dealers as to their lack of activity.

Our concern stems primarily from the fact that we understand DOT may shortly visit recordkeeping activities like ours, and will no doubt ask to see our records. Although we can protect the confidentiality of your records from competitors, we cannot refuse to show them to authorized government agents.

Will you kindly let us know why we did not receive registrations from you or your dealers during October.

Sincerely,

DONALD A. OLSON,
Manager Logistics.

ENCLOSURE NO. 2

TIRE SAFETY REGISTRY,
Paramus, N.J., November 30, 1971.

We have just completed a review of the October Activity Reports and note that your dealer participation is very low. You indicated that you had approximately ——— dealers (points of sale) ; however, you will note that no dealers registered tires in October.

Our concern stems primarily from the fact that we understand DOT may shortly visit recordkeeping activities, like ours, and will no doubt ask to see our records. Although we can protect the confidentiality of your records from competitors, we cannot refuse to show them to authorized government agents.

Mr. Francis Armstrong, Director, Office of Standards Enforcement, National Highway Traffic Safety Administration, in a talk at the NTDRA Annual Convention in September 1971 stated, "The responsibility still rests with the manufacturer to educate his dealers so that 100 percent compliance can be attained."

May we suggest that increased dealer participation may be stimulated if we assign them Dealer Identification numbers, assuming that has not already been done. If you will send us your dealer list with complete names and addresses including zip codes, we will assign numbers to those dealers who have no number as yet.

Sincerely,

DONALD A. OLSON,
Manager Logistics.

Enclosure #3

TIRE SAFETY REGISTRY
RECORD KEEPING INSTRUCTIONS
FOR
RETAIL TIRE DEALERS
(INCLUDING NEW AND USED AUTOMOBILE DEALERS WHO REPLACE TIRES)

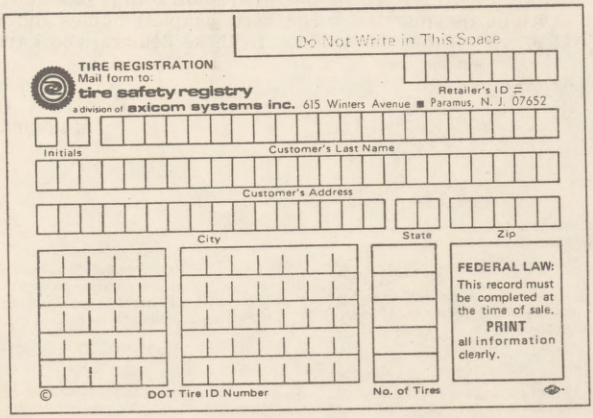
RETAIL DEALER'S RESPONSIBLITIES

A. All the material necessary for you to do what the law requires of you is supplied to you by Tire Safety Registry. You have been given:

1. These instructions.
2. TSR Registration Forms.
3. Envelopes for returning the forms to TSR.
4. A poster which explains, to your customer, why a record is being made of his purchase.

B. First, put up the poster. We recommend that you place it where it will be seen; near the cash register is an excellent location.

C. Next, become familiar with the registration form—it is a universal form and can be used for both new and retreaded tires of every size and type. We have made this form as easy for you to complete as possible, and as easy to handle, as well. Let's go through the form, following the step-by-step procedure:



Starting at the top:

1. The large space marked: "DO NOT WRITE IN THIS SPACE" is for TSR to use on completed forms. It is very important that it be left blank.

2. The row of boxes marked: "Retailer's ID #" is for your use. . . *after* TSR has assigned you a number which will identify you. Only you and TSR will know your number. You will not have to write in your name and address on any TSR registration forms. How you get your number will be explained below.

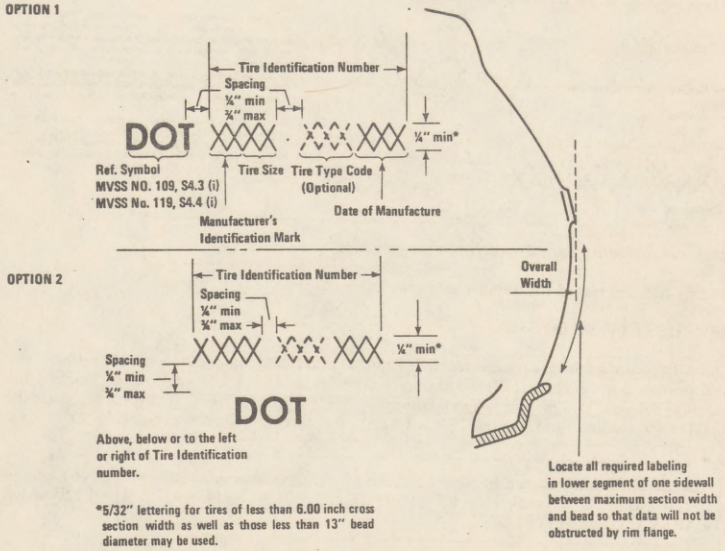
3. The next three rows of boxes are for your customer's name and address. Only the first and middle initial and last names are needed. It is very important that his Zip Code be filled in. Please use the official Post Office Department two-letter abbreviation for the state. You will find state abbreviations at the end of these instructions.

4. The bottom portion of the form is for the tire identification numbers(s) and the number of tires of each identification number. The form will take five different identification numbers . . . and any quantity of tires for each number. For example: If you sell five tires, having the same identification number, enter the identification number on the first line and the quantity five in the first box in the column: "No. of Tires". If you are selling a large quantity of tires having different identification numbers, to a taxi fleet for instance, use one line for *each different identification number*, with the total number of tires with that number in the appropriate box. If more than five different identification numbers are involved, complete a second form.

D. New Tires

If the tires are new, you will find that the molded number will vary in length, having between 7 and 11 characters, and looks like this:

IDENTIFICATION FOR NEW TIRES



1. Tire identification number shall be in "Futura Bold, Modified, Condensed or Gothic" characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding character(s) into or onto tire at indicated location on one side. (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the Bureau.

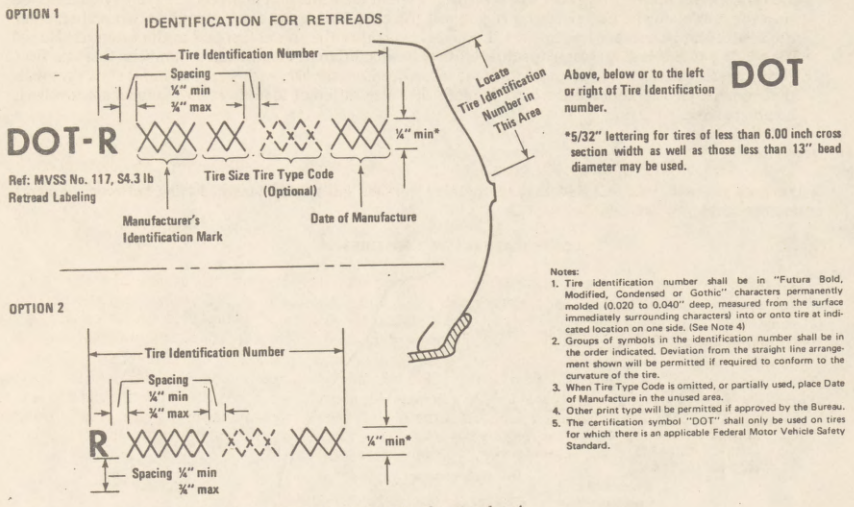
Copy it exactly as it appears on the tire.

Start with the second box. Leave the gray one blank.

DO NOT COPY THE LETTERS DOT!

E. Retread Tires

If the tires are retreads, the number of the tires will vary in length, having between 8 and 12 characters, and will look like this:



For retread tires, the first letter must be written in the grey box!

Start with the grey box and record the number as it appears on the tire.

DO NOT COPY THE LETTERS DOT–R!

F. You *do not* have to return each registration separately: please don't! This makes the handling difficult and will make your postage costs excessive. We recommend a monthly submittal to assure routine handling and ultimate protection for you. You may return them more frequently, if this is more convenient for you.(The envelopes provided for sending the forms to TSR will hold 30 forms, and can be transmitted for the one ounce postal rate.)

G. Now, about your identification number. In order to have TSR assign your number, we ask that you send in your *first day's* registrations *immediately*! BE SURE THAT YOUR NAME AND ADDRESS ARE PRINTED CLEARLY ON THE ENVELOPE.

H. When TSR receives this, your name and address will go into the computer records, with the number which will be assigned to you. This number will be forwarded to you for you to use on all future registrations. Always fill out name, address and number on the envelope. (You may find it convenient to get a rubber stamp for imprinting your forms and envelopes with your ID number.)

I. Remember, registration is required by federal law . . . starting May 22, 1971. Make sure that all of your employees know that the registration form *must* be filled out completely for every sale. Be sure that everyone in your organization is familiar with the form and knows how to fill it out. And for accurate recordkeeping, please be sure that all information is printed clearly.

J. Many firms are planning to provide space on their sales slip for overlaying the 3-1/2 X 5 inch TSR registry form–this procedure will eliminate duplicate paper work for you.

K. If you have any question, contact your distributor, tire supplier or TSR. To contact TSR write or call:

Mr. Donald A. Olson
Manager Logistics
Tire Safety Registry
P.O. Box 648
Paramus, New Jersey 07652
Telephone 201-262-8200

(To assure a prompt reply, use the above address.)

L. Additional forms and envelopes will be supplied on a routine basis by your tire supplier.

M. Tire Recall

In the event of a recall of tires of given identification number(s) you will be notified by certified mail and you are required by law to immediately discontinue selling the tires. Disposition instructions for tires in stock will be provided at that time.

NOTE:

To make the recordkeeping task as simple as possible Tire Safety Registry has developed a standard form and system which is suitable for registering all types and brands of tires. *TSR will register all tires that are submitted to us*, irrespective of whether or not we are the designated recordkeeping source for a particular manufacturer. To use our single form approach simply use TSR forms in lieu of any others, which may be provided to you—we are bonded and certify full compliance with the law. Under the TSR program your records will be held in strict confidence. TSR will bill manufacturers for our services; however, if manufacturers who pay for these services, demand data from your records, we are obligated, by the regulation as written, to provide this information. In the event the manufacturer requests your information you will be advised—should you prefer to pay for the recordkeeping we will not turn your records over to manufacturers except in the case of a DOT implemented recall.

TWO-LETTER STATE ABBREVIATIONS

Alabama	AL	Kentucky	KY	Oklahoma	OK
Alaska	AK	Louisiana	LA	Oregon	OR
Arizona	AZ	Maine	ME	Pennsylvania	PA
Arkansas	AR	Maryland	MD	Puerto Rico	PR
California	CA	Massachusetts	MA	Rhode Island	RI
Canal Zone	CZ	Michigan	MI	South Carolina	SC
Colorado	CO	Minnesota	MN	South Dakota	SD
Connecticut	CT	Mississippi	MS	Tennessee	TN
Delaware	DE	Missouri	MO	Texas	TX
District of Columbia	DC	Montana	MT	Utah	UT
Florida	FL	Nebraska	NE	Vermont	VT
Georgia	GA	Nevada	NV	Virginia	VA
Guam	GU	New Hampshire	NH	Virgin Islands	VI
Hawaii	HI	New Jersey	NJ	Washington	WA
Idaho	ID	New Mexico	NM	West Virginia	WV
Illinois	IL	New York	NY	Wisconsin	WI
Indiana	IN	North Carolina	NC	Wyoming	WY
Iowa	IA	North Dakota	ND		
Kansas	KS	Ohio	OH		

Enclosure #4

SALES INVOICE/TIRE REGISTRATION No. 1308

THIS AREA IS FOR YOUR COMPANY NAME, ADDRESS, TELEPHONE, ETC.

DATE / /

QTY.	DESCRIPTION	UNIT PRICE	TOTAL
		TOTAL	

Do Not Write In This Space

TIRE REGISTRATION
Mail form to:
tire safety registry
a division of axicom systems inc. 615 Winters Avenue ■ Paramus, N. J 07652

Retailer's ID #

Initials

Customer's Last Name

Customer's Address

City

State

Zip

DOT Tire ID Number

No. of Tires

FEDERAL LAW:
This record must be completed at the time of sale.
PRINT all information clearly.

THE SNAPOUT FORMS COMPANY CHARDON OHIO
MANUFACTURERS & DESIGNERS OF SNAPOUT ® & CONTINUOUS SNAPTAB FORMS
OR 33338

ENCLOSURE NO. 5

TIRE SAFETY REGISTRY,
Paramus, N.J., December 1971.

DEAR TSR CUSTOMER AND TIRE DEALER: Tire Safety Registry has been studying ways and means to reduce the amount of time and effort required for dealers to comply with Federal Regulation No. 574 (Time Recordkeeping). One sure way is to reduce the amount of writing required. If the name and address of the purchaser and the DOT tire numbers have to be written only once, this becomes a significant time saver.

The enclosed sample forms accomplish the writing reduction mentioned above. When a sale is recorded the tire registration form is separated (torn along the perforation) from the original invoice and forwarded to TSR. The top part of the first sheet (original) is given to the customer. The second copy (yellow) is retained by the dealer as a record of the transaction with the customer's name and address and the tire numbers.

These forms can be furnished with your name, address, telephone number, etc., or you may have the form imprinted by your own printer. TSR will contract with the forms manufacturer for bulk quantities of these forms. We believe we can furnish you and your dealers with forms equivalent to what you are now using at a price less than you are now paying. Of course the greatest saving will come from the time you save in recording tire transactions.

If sufficient interest is generated, we can furnish these forms, and possibly variations of them, to you and your dealers (who may order directly from us) at the prices shown on the reverse side order form.

Your suggestions for improving this form will be welcome.

Sincerely,

D. A. OLSON,
Manager, Logistics.

ENCLOSURE NO. 6

TIRE SAFETY REGISTRY,
Paramus, N.J., 13, 1971.

MR. TIRE DEALER: As a service to tire dealers to assist you in making the job of tire recordkeeping easier and less time consuming, Tire Safety Registry has developed the enclosed combination invoice/registration form and is offering it to dealers.

The use of this form could cut your writing time in half and will provide you with a tangible record of the fact that you are adhering to the law.

Tire Safety Registry can have your name and address printed on the forms or you can have it done locally. Because we have standardized the form and order in large quantities we can keep the cost to you low.

Cut your tire recordkeeping costs by using this form. Fill in your order on the reverse side and send it in today.

Sincerely,

D. A. OLSON,
Manager, Logistics.

Enclosure.

85-820 O - 73 - 35

ENCLOSURE NO. 7

TIRE SAFETY REGISTRY,
Paramus, N.J.

GENTLEMEN: The enclosed tire registration form(s) has been received by Tire Safety Registry. A review indicates that it appears to be invalid (cannot be used to perform a recall) for one or more of the following reasons:

No customer name(s)
No customer address(es)
Illegible customer name(s)/address(es)
No serial number(s)
Illegible serial number(s)

Faulty serial number(s)—Tire manufacturer's DOT code, tire size code, optional code and week/year of manufacture must be indicated; refer to the TSR dealer instruction form enclosed. Tires manufactured prior to May 22, 1971 did not require the above serial number identification; therefore, any registrations containing 'old' type identification codes need not be returned to Tire Safety Registry.

Please return any completed/corrected registration(s) to: Tire Safety Registry, 615 Winters Avenue, Paramus, New Jersey 07652.

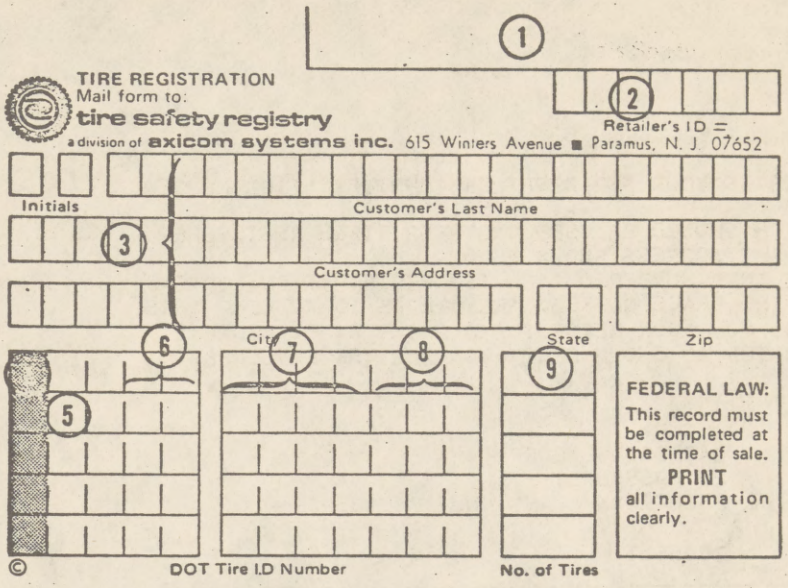
Sincerely,

DONALD A. OLSON,
Manager, Logistics.

Enclosure,

Enclosure #8

Your tire registrations can't be processed unless all the information is accurate.....and legible !



PLEASE BE SURE THAT:

All information is PRINTED !

(1) **This space is left blank.**

(2) **Your TSR assigned Retailer ID# is filled in clearly in this area.**

(3) **Customer's Name and Address are printed in this area.**

(4) **DOT code for RETREADS begin in the gray box. Don't put "R" in this box !**

(5) **DOT code for NEW tires begin in the first white box.**

(6) **Tire size code goes here.**

(7) **Some tires will show codes in this optional area. If it appears on the tire, copy it here.**

(8) **Copy the date code here.**

(9) **Quantity of tires for each ID# goes here.**

Return completed forms in the envelopes provided by TSR. Be sure to fill in your Retailer ID# on each envelope.

Enclosure #9

THIS IS YOUR TSR RETAILER IDENTIFICATION NUMBER
... B005611 ...
WHICH SHOULD BE USED ONLY FOR TIRES REGISTERED AT THE ADDRESS SHOWN BELOW.
USE THIS NUMBER ON ALL TSR REGISTRATION FORMS, IN THE SPACE MARKED: 'RETAILERS ID#'. KEEP THIS CARD FOR YOUR RECORDS AND PRINT NAME, ADDRESS AND ID# AS SHOWN BELOW, ON ALL TSR ENVELOPES.

BAINBRIDGE CORP
20 NASSAU ST
PRINCETON NJ 08540

B005611

DO NOT FAIL TO REGISTER ALL RETAIL TIRE SALES

THE DEPARTMENT OF TRANSPORTATION IS PRESENTLY CONDUCTING FIELD INSPECTIONS IN ORDER TO ENSURE THAT ALL ELIGIBLE TIRES ARE BEING REGISTERED

DO NOT CHANCE BEING FINED FOR NON-COMPLIANCE

Statement of General Motors Corporation

A number of Senate bills have recently been introduced to amend the National Traffic and Motor Vehicle Safety Act of 1966. While hearings have been held on some of this legislation, the probability and nature of any further action during this session of Congress is unclear. Nevertheless, there are several key provisions contained in this legislation on which General Motors wishes to comment. Therefore, we respectfully submit for inclusion in the record on these proceedings this statement, which includes our comments and recommendations on the following subjects:

1. Notification of noncompliance with safety standards.
2. Remedy of defects without charge.
3. Phase-in of safety standards.
4. Temporary exemption from safety standards.

1. NOTIFICATION OF NON-COMPLIANCE WITH SAFETY STANDARDS

Section 113 of the Safety Act requires that when a vehicle manufacturer determines that a safety defect exists in any of his vehicles, a defect notification must be sent to the known first purchasers of those vehicles.

It has been proposed (S. 3474) that this section of the Act be amended to require that a defect notification also be sent when the manufacturer determines that a vehicle does not comply to a safety standard, even though such non-compliance does not necessarily represent a safety defect.

Comment

In applying the present provisions of Section 113 of the Act, General Motors has generally equated the failure to comply with a standard with that of a safety defect. Therefore, the proposed provisions would put into law what has generally been our normal practice—and what we believe to be the practice of the industry. However, the language that has been proposed in S. 3474 creates two potential problems:

1. As written, the amendment would require that defect notifications be sent under all circumstances of non-compliance. This would be required even in the event of technical non-compliance with one narrow provision of a standard which could not be construed as creating an unreasonable risk to safety. Further, notifications would also be required in those cases where non-compliance is of such a limited nature as to make the deviation—whether hazardous or not—inconsequential in terms of a safety-related defect.

To illustrate the point, the lighting standard—MVSS 108—contains a large number of photometric values which must be met in instrumented tests. A slight deviation from any one of these test values constitutes non-compliance, yet the effect is undetectable to the eye and thus can hardly be classed as constituting a safety defect. A great number of safety standards contain similar detailed technical requirements, and minor deviations from them would not necessarily result in hazardous conditions.

2. The proposed language requires that the notification to owners shall indicate the measures to be taken to remedy the non-compliance with a standard. We can foresee many potential problems arising in an attempt to prescribe the steps needed to bring used vehicles—in varying conditions—into compliance with the standard in question. While such cases are likely to be rare, it would be unfortunate if such a provision were passed subject to this foreseeable problem.

Recommendation

Appendix 1, attached, contains suggested changes in the language as they would apply to Section 7 of S. 3474 as introduced. These changes would retain the provisions equating non-compliance with safety standards and safety defects but would limit defect notification requirements to such failures to meet a standard to those which are determined in good faith to be related to motor vehicle safety.

We believe these changes would preserve the essential purpose underlying that section of the bill and would adequately remedy safety hazards, while eliminating possible misunderstandings and differences as to interpretation related to matters that are not actual safety defects.

2. REMEDY OF DEFECTS WITHOUT CHARGE

It has been proposed (S. 2946) that new provisions be added to Section 113 of the Safety Act which would have the effect of requiring motor vehicle manufacturers to offer to remedy safety-related defects without charge to vehicle owners.

These provisions are identical to those proposed in 1970 as Senate amendments to H.R. 10105, a bill which had earlier been passed by the House. Subsequently, these provisions were dropped in the Senate/House conference.

Comment

At the time the Senate amendments were introduced, it was pointed out in a letter from Ross Malone, general counsel of General Motors, to Representative Harley Staggers, in whose committee the bill originated, that General Motors has no objection to such a statutory requirement as long as the Act is simultaneously amended to provide a fair and more expeditious procedure for resolving disputes as to the existence of a safety-related defect in those rare instances when such a dispute arises. Our position today remains the same, since the primary effect of this proposal simply makes mandatory what has historically been the voluntary practice of motor vehicle manufacturers. (A copy of Mr. Malone's letter is attached.)

However, there is a potential collateral effect that must be considered in the interest of the consumer as well as the manufacturer. We refer to those instances (which, based on past experience, may rarely occur) in which the manufacturer disagrees with the NHTSA and does not believe the vehicle actually is defective. A posible result of such disagreement could be a delay in sending notices to owners and thus deferring the timely performance of recall campaigns.

The potential for such delay is increased by the fact that when there is a difference of opinion, existing procedure does not assure a manufacturer of adequate safeguards to receive a fair hearing at NHTSA. The manufacturer can obtain constitutional due process only by prolonging the dispute through a full-scale trial in a federal court.

To help overcome such an eventuality and to expedite the settlement of these possible controversies, General Motors strongly urges that a "due process" hearing requirement be included in the statute. Previous objections by the Department of Transportation that such a due proces hearing would unduly delay the Department's ability to act promptly are not valid. Quite the opposite is more likely. Extensive delays can be foreseen if present court procedures must be relied upon as the means to resolve a disagreement. The remainder of this section of our statement covers, in greater detail, the reasons for including a due process provision.

Manufacturer's need for a due process hearing

It is generally agreed that in the highly unusual situation where a motor vehicle manufacturer disagrees with a NHTSA finding of the existence of a safety-related defect, the manufacturer has a constitutional right to a "full and fair hearing" before the manufacturer can be required to send a notification or be subject to civil penalties for a contumacious refusal to do so. Such a due process hearing should take place within NHTSA before the final order is issued. The Department of Transportation has taken the position that the due process hearing should take place in a federal court after the NHTSA order is issued. (See S. Rep. No. 91–559, 91st Cong., 1st Sess., pp. 10, 38–45 (1969).)

The constitutional right of due process is flexible in its application. It embodies a concept of reasonableness in the circumstances of an individual situation. In resolving a question as to the existence or nonexistence of a claimed defect, it is of paramount importance that the basic underlying facts be established completely, clearly and accurately. These basic facts fall generally into two categories—first, reports of laboratory or field tests and, second, data as to actual field experience of vehicle owners. Thus, the conclusion depends on an evaluation of hard facts; it does not involve policy as in the formulation of a safety standard.

In view of this subject matter, there are three indispensable elements of due process which must be observed. First, such factual evidence must be put before the decision-maker at a hearing, either in testimony by witnesses or in documents introduced by witnesses who can vouch for their accuracy and explain them. Such witnesses must testify under oath, to insure accuracy of the information on which the decision is based. Second, all witnesses must be subject to

cross-examination to provide clarity of the evidence and to insure its completeness and accuracy. Third, the decision must be based solely on the evidence produced in that manner. The decision-maker must not be influenced by material not included in the "record" made at the hearing. Otherwise the effects of the first two elements would be vitiated.

In a court trial all those elements of due process are automatically present. Those elements of due process would be adequate in an administrative hearing concerning this subject matter, and could be provided by NHTSA without unduly hampering the administrative proceeding. This is what is proposed here.

Time factors

In those very rare instances when a vehicle manufacturer believes it is essential to contest the NHTSA ruling of a safety-related defect, the holding of a due process administrative hearing by NHTSA would expedite the final resolution of the controversy.

In the first place, such a hearing can hardly help but lead to a more sound decision by the Administrator, and it might obviate the delay of court review. Such more careful consideration of the matter might convince the Administrator that the manufacturer's position was correct, which would end the matter. On the other hand, the manufacturer might be convinced either that the Administrator was correct in ordering notification or, while still in disagreement, the manufacturer might conclude that chances of success in court were so small as to make a court proceeding unwise.

In the second place, even if the manufacturer took an additional step of court review, such court action itself would be expedited over the present procedure. The proposed amendment provides for review directly by a court of appeals of the record made at the due process hearing within NHTSA, thus saving all the time consumed by the proceeding in the district court. Even if this proposal is rejected, a review proceeding in a district court could be on the basis of the record made at the NHTSA hearing rather than a de novo trial with discovery, examination of witnesses, etc. This could shorten the time of the court action by months—even years.

Such expedited court review—on the basis of a record rather than a trial de novo—necessarily depends on the existence of a proper record. The only way to provide the court with a proper record is for NHTSA to hold a due process hearing.

Policy reasons for a due process hearing

That a statutory requirement of a due process hearing of the issue of existence of a defect would be sound public policy is made clear in Professor Davis' Administrative Law Treatise, which is generally recognized as an authoritative text on administrative law. Chapter 7, "Requirement of Opportunity to Be Heard", discuss this point in detail, with ample support in citations to court decisions.

The Administrative Procedure Act recognizes that there are two basic types of administrative proceedings—a rule-making proceeding, in which a "hearing" may or may not be appropriate, depending upon the particular circumstances, and an "adjudicative" proceeding, in which a "hearing" is normally essential to provide fairness. Under the Safety Act, the promulgation of federal motor vehicle safety standards under section 103 is an example of a rulemaking proceeding, while a determination under section 113(e) is an example of a proceeding in which an adjudicatory hearing should be held. Professor Davis uses the labels of "trial" hearings and "argument" hearings.

The criterion for choosing between the statutory requirement for one or the other of the two types of hearing is stated by Profesor Davis as follows:

"Of great consequence is the rather elementary proposition that the method of trial is designed for resolving issues of fact, and that the method of argument, not the method of trial, is normally the appropriate oral process for resolving non-factual issues of law and policy and discretion." (§ 7.01)

Here, it is clear that a determination as to the existence or non-existence of a defect presents issues of fact, not law or policy or discretion. The issues of fact cannot be decided by intuition, but only from evidence such as laboratory tests and experience of users of the vehicle. Information of this type, in the interest of elemental fairness, should be presented under oath to insure veracity and should be subject to cross-examination in insure accuracy.

Recommendation

Appendix 2, attached, contains suggested language as it would apply to Section 7 of S. 3474 including the proposed changes recommended previously in

regard to noncompliance with safety standards. We believe such changes would be in the public interest, would expedite final disposition of unusual controversies, and would provide fairness to the manufacturers.

3. PHASE-IN OF SAFETY STANDARDS

A bill (S. 3823) has been introduced that would amend the Safety Act to allow safety standards to become effective in stages, applying over a period of years to an increasing percentage of vehicle production.

Presently, the Act requires that standards apply to all cars of a particular type on or after a specific date. This date must, therefore, be set far enough into the future to allow time for necessary manufacturing changes so that the entire production output of all manufacturers will be able to comply.

During recent hearings before the Senate Commerce Committee, Douglas Toms, NHTSA Administrator, noted in relation to the proposed legislation: "This new authority would permit us to phase-in a standard . . . thereby resulting in the production of safer vehicles at earlier dates than was otherwise possible."

Comment

General Motors agrees with and supports the proposed regulatory concept of phasing-in of safety standards. As emphasized above by Mr. Toms, there is a compelling safety reason to require at least a portion of the cars being produced to carry advanced safety features rather than delaying their introduction for a year or perhaps two years until all cars can be so equipped.

There are other valid reasons for supporting this concept. It has long been a practice in the automotive industry to phasein new features—especially those of a complex and highly technical nature. This procedure permits the manufacturer to evaluate the feature's reliability and its value to the motorist on an increasing number of cars operating under real-world conditions, before committing the feature to full production. In the future, safety features are likely to become more complex. Therefore, the proposal to phase in safety standards can be considered a timely one.

Phase in of complex safety features can also contribute to a better product and lower costs. The requirement that all of a manufacturer's products be equipped with complex new systems at one time places an extremely heavy burden on production personnel. Under such pressures, product quality can suffer and costs increase as additional inspections are needed and more corrections and repairs must be made.

Finally, phase-in would contribute to improved service performance in the field, as additional time would be available for adequate training of the mechanics who must service and repair these new features, and to produce the service parts that must be readily available in dealerships and repair shops nationwide.

In summary, the phasing in of standards should ultimately result in both greater safety and more satisfied customers.

S. 3823 is the only bill presently introduced on the subject of phase-in of safety standards. Our comments on this particular bill are as follows:

1. As presently written, the bill would render inapplicable the limitations set forth in Section 103(a) and the criteria in 103(b) of the Act for those standards having phase-in dates. They would remain applicable to all other standards with a single effective date. This probably was not intended.

2. While the bill requires that the effective dates specified by the Secretary shall be at one year intervals, the bill also requires that the specified percentage of vehicles manufactured during each six-month period following the effective date also comply. This would create unnecessary difficulties under certain circumstances. For example, a manufacturer could comply with a percentage requirement for an entire model year, but be prevented—by causes beyond his control—from complying with the six-month's percentage requirement. This could occur for a number of reasons, such as strikes, supplier difficulties, materials shortages or machinery breakdowns.

Recommendation

It would appear desirable and logical to include all the provisions of this bill as an addition to Section 103(c) of the Act, rather than in separate subsection as now written. It is further recommended that the "six month" compliance requirement be dropped. Appendix 3, attached, contains a suggested draft of the entire bill.

4. TEMPORARY EXEMPTIONS FROM SAFETY STANDARDS

Section 123 of the Safety Act provides for certain conditions under which the Secretary of Transportation may exempt a manufacturer's vehicles from complying with the safety standards. As also provided in the Act, this authority has expired and proposals are now under consideration that would reinstate it. These include S. 3474, H.R. 11287, and the amendment recently proposed by Senator Weicker. The proposals contain various conditions, any one of which, if met by the manufacturer, would qualify his vehicles for an exemption from safety standards for up to three years.

Comment

In each of the proposals, one of the conditions that can be claimed as the basis for a temporary exemption is that compliance would cause the manufacturer substantial economic hardship.

However, as these bills are directed toward providing regulatory relief to low volume manufacturers (those whose annual production or annual U.S. sales volume is 10,000 vehicles or less), General Motors and other major automobile companies would not be eligible for an exemption under any circumstances.

Despite the exclusion of major U.S. manufacturers from the provisions of this proposed legislation, extraordinary situations can arise where they would be confronted with an exceptional economic loss based on compliance with the standards then in effect. We have reference to occurrences beyond the control of the manufacturer, in which production is temporarily stopped and is then resumed at a later date, when new standards may be in effect.

Under the present law, a manufacturer cannot continue to build the earlier model, as it would violate the newly effective standards. As a result, production tooling would have to be scrapped prematurely, along with a substantial portion of his inventory of parts and materials. The prospect of this economic loss occurring can be reduced measurably through an additional provision in the proposed legislation.

Recommendation

It is recommended that a provision be considered whereby, under conditions of prolonged work stoppage for reasons such as fires, floods and strikes, any manufacturer would, upon the resumption of normal production, qualify for an exemption from newly effective safety standards. Such an exemption would remain in effect so long as compliance with the standards previously in effect is maintained, in order to utilize the inventory on hand and minimize the potential economic loss. Appendix 4. attached, contains a suggested language change as it would apply, for example, to Section 9(d) of S. 3474.

APPENDIX 1—S. 3474

Sec. 7. (a) Subsection (a) of section 113 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1402) is amended by adding at the end thereof the following:

Such notification shall also be furnished with respect to any failure to comply with an applicable Federal motor vehicle safety standard which is of such a nature as to create a defect determined in good faith to be related to motor vehicle safety.

(b) Subsection (b) of section 113 of such Act is amended by inserting immediately after "required by subsection (a)" the following: "or (e)".

(c) Subsection (c) of section 113 of such Act is amended to read as follows:

The notification required by subsection (a) or (e) of this section shall contain a clear description of such defect, an evaluation of the risk to traffic safety reasonably related to such defect, and a statement of measures to be taken to repair such defect.

(d) Subsection (e) of section 113 of such Act is amended by inserting in clause (1) after "103" the following:

", in such a manner as to create a defect related to motor vehicle safety";

APPENDIX 2—S. 3474

(Incorporating substance of S. 2946)

Sec. 7. (a) Subsection (a) of section 113 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1402) is amended by adding at the end thereof the following:

Such notification shall also be furnished with respect to any failure to comply with an applicable Federal motor vehicle safety standard which is of such a nature as to create a defect determined in good faith to be related to motor vehicle safety.

(b) Subsection (b) of section 113 of such Act is amended by inserting immediately after "required by subsection (a)" the following: "or (e)".

(c) Subsection (c) of section 113 of such Act is amended to read as follows:

(c) The notification required by subsection (a) or (e) of this section shall contain a clear description of such defect, an evaluation of the risk to traffic safety reasonably related to such defect, a statement of measures to be taken to repair such defect, and the commitment of such manufacturer to cause such defect to be remedied without charge to the purchaser.

(d) Subsection (e) of section 113 of such Act is amended to read as follows:

(e)(1) If through testing, inspection, investigation, or research carried out pursuant to this title, or examination of reports pursuant to subsection (d) of this section, or otherwise, the Secretary determines that any motor vehicle or item of motor vehicle equipment—

(A) does not comply with an applicable Federal motor vehicle safety standard prescribed pursuant to section 103, in such a manner to create a defect related to motor vehicle safety; or

(B) contains a defect which relates to motor vehicle safety;

then he shall immediately notify the manufacturer of such motor vehicle or item of motor vehicle equipment of such defect or failure to comply. The notice shall contain the findings of the Secretary and shall include all information upon which the findings are based. The Secretary shall afford such manufacturer an opportunity to present his views and evidence in support thereof, to establish that there is no failure of compliance or that the alleged defect does not affect motor vehicle safety. If the manufacturer desires such opportunity, there shall be a hearing before the Secretary or his designee at which sworn testimony is taken, the parties thereto are accorded opportunity for cross-examination, and a full and complete record of the evidence adduced is prepared and certified. If after such hearing the Secretary determines, solely on the basis of the record of the hearing, that such vehicle or item of equipment does not comply with applicable Federal motor vehicle safety standards, or contains a defect which relates to motor vehicle safety, the Secretary shall direct the manufacturer to furnish the notification specified in subsection (c) of this section to the purchaser of such motor vehicle or item of motor vehicle equipment as provided in subsections (a) and (b) of this section.

(2)(A) Any person who will be adversely affected by the Secretary's determination made under paragraph (1) of this subsection may, at any time prior to the 60th day after the order making such determination is issued by the Secretary, file a petition with the United States Court of Appeals for the circuit in which such person resides or has his principal place of business for a judicial review of such determination. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary or other officer designated by him for that purpose. The Secretary shall file in the court the record of the proceedings on which the Secretary based his determination, as provided in Section 2112 of Title 28 of the United States Code.

(B) If the petitioner applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there was no opportunity to adduce such evidence in the proceeding before the Secretary, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Secretary in a hearing or in such other manner, and upon such terms and conditions, as to the court may seem proper. The Secretary may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken, and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

(C) Upon the filing of the petition under this paragraph, the court shall have jurisdiction to review the determination of the Secretary in accordance with Section 706 of Title 5 of the United States Code. With respect to any determination reviewed under this paragraph, the court may grant appropriate relief pending conclusion of the review proceedings, as provided in Section 705 of such Title.

(D) The judgment of the court affirming or setting aside, in whole or in part, any such determination of the Secretary shall be final, subject to review by the Supreme Court of the United States upon certiorari or certification, as provided in Section 1254 of Title 28 of the United States Code.

APPENDIX 3

A BILL To amend the National Traffic and Motor Vehicle Safety Act of 1966 to authorize the Secretary to phase in motor vehicle safety standards by specified percentages over a period of time, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Section 103 of the National Traffic and Motor Vehicle Safety Act of 1966 (16 U.S.C. 1392) is amended by adding at the end of subsection (c) thereof the following:

"The Secretary may by order specify a series of effective dates for a Federal motor vehicle safety standard, on or after which a specified percentage of motor vehicles, to which the standard applies, manufactured by each manufacturer for purposes of sale in the United States shall conform to that standard. Each order specifying a series of effective dates should include a statement of the reasons for which the series of effective dates is found to be in the public interest. The final effective date in a series shall in all cases be not more than two years after the initial effective date, and all motor vehicles, to which the standard applies, manufactured on or after the final effective date for purposes of sale in the United States shall conform to the standard. In the case where one or more manufacturers are wholly owned by another person or corporation, those manufacturers together with the owning person or corporation shall be considered as one manufacturer for purposes of this subsection. In all other cases each person or corporation that is a manufacturer shall be considered a separate manufacturer for purposes of this subsection."

SEC. 9(d)

No manufacturer whose total motor vehicle production, as determined by the Secretary, exceeds ten thousand annually shall be eligible for an exemption under this section unless the manufacturer establishes to the satisfaction of the Administrator, that the substantial economic hardship that would accompany compliance and make it commercially impracticable, arose from a cause or causes beyond the manufacturer's control, including but not limited to fires, floods and labor disputes, and could not have been overcome by due diligence.

GENERAL MOTORS CORPORATION,
FEBRUARY 23, 1970.

Re: H.R. 10105.

Hon. HARLEY O. STAGGERS,
Chairman, Interstate and Foreign Commerce Committee, House of Representatives, Rayburn Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: General Motors Corporation respectfully requests that in lieu of the matter proposed by the Senate to be inserted in Section 113 of the National Traffic and Motor Vehicle Safety Act of 1966 as a new subsection (g) thereof, the Conference Committee adopt the amendments set forth in Appendix A to this letter. The circumstances and reasons prompting this request are as follows:

As it passed the House, H.R. 10105 did not include any requirement that motor vehicle manufacturers remedy failures to comply with applicable motor vehicle safety standards, or safety-related defects, "without charge". (H. Report 1–350)

The Senate, without public hearings, amended the House-passed bill to impose statutorily upon the manufacturer the obligation of remedying "without charge" any motor vehicle or item of motor vehicle equipment "determined by the Secretary under subsection (e) to contain a failure to comply with applicable motor vehicle safety standards prescribed under this title or a defect which relates to motor vehicle safety."

For half a century or more, automobile manufacturers have voluntarily repaired safety-related defects at their own expenses. For this reason we submit that inclusion in the statute of a "without charge" requirement is unnecessary, although General Motors has no basic objection to such a statutory requirement. However, if this provision is to be added to the Act, then as a corollary the bill should be further amended to provide a fair and more expeditious procedure for resolving disputes as to the existence of a safety-related defect in those rare instances when such a dispute arises between the manufacturer and the Department of Transportation.

Accordingly, we propose for your consideration that the bill, as amended by the Senate, be further amended—

(1) By striking "under subsection (e)" in Section 113(g)(2) (renumbered 113(g)(1)(B) in our proposal) and inserting in lieu thereof", on the record after opportunity has been accorded for a hearing before the Secretary or his designee at which sworn testimony is taken, the parties thereto are accorded opportunity for cross-examination, and a full and complete record of the evidence adduced is prepared and certified,"; and

(2) By providing for a direct appeal to a Court of Appeals, in order to shorten the present procedure of judicial review by de novo trial in a Federal District Court.

In making this proposal, we wish to emphasize that these proposed amendments would not make a formal administrative hearing a prerequisite to future recall campaigns.

Section 113(a), and Section 113(g)(1) as added to H.R. 10105, which would not be changed by our proposed amendments except for renumbering, make it mandatory upon a manufacturer to notify first purchasers and to offer to repair "without charge" any defect determined by the manufacturer in good faith to be safety-related. This obligation is imposed by the Act without involving any action on the part of the Secretary. The only occasion for the Secretary to make a determination as to the existence of a safety-related defect is when the manufacturer has not issued a notification pursuant to subsections (a) and (c) and information in the possession of the Secretary indicates to him that there should be a recall campaign. Experience during the 3½ years since this statute was enacted has demonstrated that a difference of opinion between the manufacturer and the Secretary of such substance as to lead to a formal determination proceeding will be highly infrequent in the future. Nevertheless, because of the importance to the manufacturer and because of the public interest involved, we think it would be highly desirable to provide a better procedure for this rare eventuality.

The remainder of this letter summarizes very briefly the major reasons why these two amendments would be desirable.

HEARING PROCEDURE

An administrative determination that a vehicle is "defective" has a tremendous potential impact upon the manufacturer. The expense of a recall campaign can run into millions of dollars. In addition, an administrative finding of a defective product can cause a great loss of sales, even though a manufacturer is ultimately vindicated after court review. Therefore, simple fairness demands that the manufacturer be accorded administrative due process.

A determination of the existence or non-existence of a safety-related defect presents narrows issues of fact. These issues of fact should not be decided by intuition or emotion, but solely on the basis of hard evidence, such as laboratory tests and experience of users of the vehicle. Due process means that information of this type be presented under oath to insure veracity and be subject to cross-examination to insure accuracy, and that the Secretary's ultimate decision be based on a definite record made under such a procedure.

Providing such due process would not materially prolong the administrative proceeding beyond present practice. To avoid possible delay from formalities which are not needed for this type of determination, our proposal does not require the assignment of a hearing examiner appointed under 5 U.S.C. 3105, the preparation of an initial decision, or other formalities prescribed by 5 U.S.C. 557, although the Secretary naturally would have discretion to take any one or more of such steps if he felt them appropriate under the special circumstances of a particular proceeding. Sworn testimony and cross-examination could hardly add more than a few hours to the length of the hearing that is presently required by the Act, at which the manufacturer has the vague "opporunity to present his views and evidence in support thereof.

A vehicle manufacturer has no incentive to demand a hearing and engage in procrastination merely for the sake of delay. A manufacturer would not benefit from delay for delay's sake. It would be contrary to the manufacturer's own interest to invest effort and counsel fees in a protracted administrative hearing, and suffer the adverse publicity of engaging in a controversy with the Secretary, unless the manufacturer had reasonable grounds for believing that he would prevail in the end. Moreover, a delay is contrary to a manufacturer's interests since it would operate to increase his potential exposure to product liability litigation.

A statutory requirement for the type of administrative hearing which our proposed amendment would provide is consistent with sound public policy. This position is strongly supported by Davis, Administrative Law Treatise, Chapter 7, "Requirement of Opportunity to be Heard".

Appeal Procedure

The second part of our proposed amendment, providing for direct review by a Court of Appeals, follows, for the most part, the appeal provisions which were adopted in conference (Conference Report 91–581) and included in the Child Protection and Toy Safety Act of 1969 (Public Law 91–113).

Clearly it is in the public interest as well as in the manufacturer's interest to speed up judicial review.

Under the bill as passed by the Senate, a vehicle manufacturer who desired to contest an adverse determination by the Secretary could either do nothing and wait for the institution of enforcement proceedings, or he could seek judicial review on his own initiative. In either case, this judicial review would consist of a trial de novo in a Federal District Court, after which the losing party could appeal to a Court of Appeals. Our proposal would eliminate the first of those two court proceedings and provide for direct review by the Court of Appeals. This could easily speed up final disposition of the controversy by a year or more.

Our proposal for the amendment of (renumbered) Section 113(g)(1)(B) is essential to adequate direct review by a Court of Appeals, so that both parts of our proposal are necessary to accomplish this desirable expediting. A court of appeals could not practicably conduct the review contemplated by 5 U.S.C. 706 unless it had before it a proper record such as would be provided by our proposed amendment to Section 113(g)(1)(B).

When the Senate Commerce Committee was considering the inclusion of the "without charge" requirement, the automobile manufacturers proposed that subsection 113(e) be amended so that the Secretary's recall determination would be based upon substantial evidence. In rejecting this proposal, the Senate Report (91–559, p. 10) states:

"The committee considered the suggestion, but found it unnecessary. As pointed out in a letter dated November 11, 1969, from the Chief Counsel of the Federal Highway Administration, a copy of which appears as appendix B of this report, the Secretary's recall determinations are not self-executing. Enforcement can only be compelled by judicial proceedings in which a manufacturer is free to challenge the validity of the Secretary's determination.

"Moreover, such proceedings will be tried de novo in the district courts, and subsection 10(e) of the Administrative Procedure Act expressly provides that the court, in such a trial de novo, may set aside administrative determinations where it finds them to be unwarranted by the facts (5 U.S.C. 706). In view of the safeguards against arbitrary or unreasonable determinations by the Secretary which are not factually supported, the committee did not find it necessary to amend the procedures established in subsection 113(e)."

The major argument offered (see Chief Counsel's letter, p. 41 et seq., Senate Report 91–559) in support of the foregoing review procedure and in opposition to the adoption of a "substantial evidence" in test in the statute is that this would require the holding of a formal hearing which would hamper the Secretary's ability "to act promptly where safety requires it." The same letter points out, however, that the Secretary's order is not "self-executing" and, therefore, the Secretary would, if his order is disputed, have to go to the district court for enforcement and thus, a de novo hearing would be held. There could also be an appeal to a Court of Appeals from the decision of the district court.

Neither the Department of Transportation, in its comments, nor the Senate Commerce Committee appears to have considered the time-saving benefit of direct review by a Court of Appeals.

In requesting this further amendment we do not imply or suggest that the present or a future Secretary would wish to act arbitrarily or otherwise make determinations without sufficient factual basis for doing so. We ask you to consider, however, that (1) any controversy between the Secretary and a manufacturer will probably arise in a marginal or close case situation; (2) the factual issues as to whether or not there is a defect, and if so is it safety related, would present narrow but sometimes difficult questions; and (3) these questions can

best be resolved pursuant to our proposed procedures which are generally recognized as the most appropriate for factual, as contrasted to policy, determinations.

For the foregoing reasons we urge the adoption of the amendment accompanying this letter.

We are taking the liberty of sending a copy of this letter to the other House of Representatives conferees, and we are writing a similar letter to the Chairman of the Senate Commerce Committee.

Respectfully yours,

ROSS L. MALONE,
General Counsel.

APPENDIX A

H.R. 10105—CONFERENCE COMMITTEE

NUMBERED AMENDMENT ( )

In lieu of the matter proposed by the Senate to be inserted in Section 113(a) of the National Traffic and Motor Vehicle Safety Act of 1966 as a new subsection (g) thereof, insert the following:

"(g)(1) If—

"(A) any motor vehicle (including any item of original motor vehicle equipment) or tire is determined by the manufacturer under subsection (a) to contain a defect which relates to motor vehicle safety; or

"(B) any motor vehicle or item of motor vehicle equipment is determined by the Secretary, after opportunity has been accorded for a hearing before the Secretary or his designee at which sworn testimony is taken, the parties thereto are accorded opportunity for cross-examination, and a full and complete record of the evidence adduced is prepared and certified, to contain a failure to comply with applicable motor vehicle safety standards prescribed under this title or a defect which relates to motor vehicle safety; and the notification specified in subsection (c) is required to be furnished on account of such failure or defect, then—

"(i) the manufacturer of each motor vehicle presented for remedy pursuant to such notice shall cause such failure or defect in such motor vehicle (including any item of original motor vehicle equipment) to be remedied without charge; or

"(ii) the manufacturer of each such other item of motor vehicle equipment presented for remedy pursuant to such notice shall cause such failure or defect in such item of motor vehicle equipment to be remedied without charge. If a manufacturer can establish to the satisfaction of the Secretary that a failure to comply with an applicable motor vehicle safety standard is of such an inconsequential nature that the purposes of this title and the public interest would not be served by requiring the applicable manufacturer to remedy such noncompliance, the Secretary may, upon publication of his reasons for such finding, exempt such manufacturer from the requirements of this subsection with respect to such failure.

"(2)(A) Any person who will be adversely affected by the Secretary's determination made under Section 113(g)(1)(B) may, at any time prior to the 60th day after the order making such determination is issued by the Secretary, file a petition with the United States Court of Appeals for the circuit in which such person resides or has his principal place of business for a judicial review of such determination. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary or other officer designated by him for that purpose. The Secreary shall file in the court the record of the proceedings on which the Secretary based his determination, as provided in Section 2112 of Title 28 of the United States Code.

"(B) If the petitioner applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that such additional evidence is material and that there was no opportunity to adduce such evidence in the proceeding before the Secretary, the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before the Secretary in a hearing, or in such other manner, and upon such terms and conditions, as to the court may seem

proper. The Secretary may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken, and he shall file such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original determination, with the return of such additional evidence.

"(C) Upon the filing of the petition under this paragraph, the court shall have jurisdiction to review the determination of the Secretary in accordance with Section 706 of Title 5 of the United States Code. With respect to any determination reviewed under this paragraph, the court may grant appropriate relief pending conclusion of the review proceedings, as provided in Section 705 of such Title.

"(D) The judgment of the court affirming or setting aside, in whole or in part, any such determination of the Secretary shall be final, subject to review by the Supreme Court of the United States upon certiorari or certification, as provided in Section 1254 of Title 28 of the United States Code."

