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AN ANALYSIS OF INDUSTRY RESPONSES TO FEDERAL REGULATIONS IN SAFETY REQUIREMENTS FOR NEW AUTOMOBILES

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16. Abstract

This report presents findings of an initial study of how the automobile industry has responded to the promulgation of motor vehicle standards by the U.S. government. The report examines three safety standards as evaluative cases:

MVSS 203--Steering column impact
MVSS 212--Windshield mounting
MVSS 215--Exterior protection

The industry responses to the standards are discussed; there is an evaluation of the effects of the standards on industry; an analysis is made of the role of government in the promulgation process. There are conclusions and recommendations for further research.

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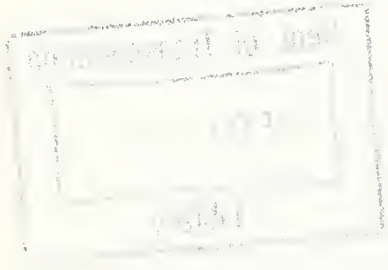


PREFACE

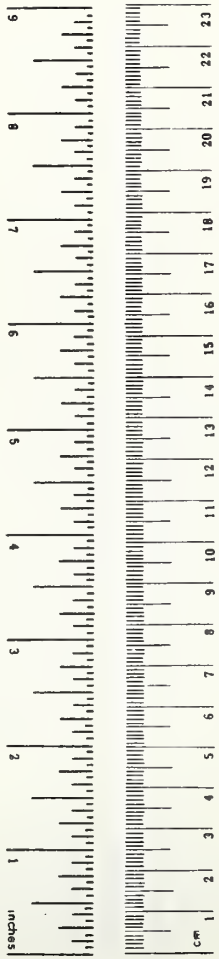
The energy crisis, coupled with the goal of a cleaner environment and a reduction in traffic fatalities, has created an unprecedented national requirement for the development and implementation of socially efficient auto technology. In response to this urgent need, alternative Federal Policies for inducing innovation are being assessed under the Auto Technology Program. This is a complex task, encompassing Regulatory Actions, R & D Incentives, Economic Incentives, and Institutional Incentives for both the buyers and producers of automobiles. The present study provides an important link in addressing these questions. By means of a case study of the auto industry's response to three safety regulations, important conclusions are derived concerning the strengths and weaknesses of past regulatory practices.

This work was carried out as part of the Auto Technology Program (HS928) at the Transportation Systems Center, under the sponsorship of Mr. William Devereaux, Office of the Secretary of Transportation. The contract technical monitors were Mr. Robert Ricci and Dr. Bruce Rubinger. The current program evolved from the Automotive Energy Efficiency Program which was started in 1974 to evaluate the capability of the automotive industry to improve the fuel economy of their production vehicles, and to assess the energy, safety, economic, and environmental effects. The importance of these objectives was recognized by the Interagency Federal Task Force on Motor Vehicle Goals Beyond 1980. In 1976, responsibility for setting fuel economy standards for vehicles up to 10,000 pounds GVW was delegated to NHTSA, and the present project emerged, with its focus on significant issues of technological innovation as influenced by Federal Policies.

METRIC CONVERSION FACTORS

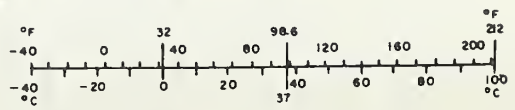
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	he
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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1. INTRODUCTION

1.1 BACKGROUND

This report presents findings of an initial study of how the automobile industry has responded to the promulgation of motor vehicle standards by the U.S. government.

Increasingly, the position is being taken by the public that major changes must occur in the configuration and use of the motor vehicle. This form of transportation dominates the consumption of scarce natural resources, and is a major contributor to the problem of air pollution; the motor vehicle is also involved in a large number of deaths and injuries that occur each year. In short, changes must occur in the design and use of motor vehicles to reduce fuel consumption, improve air quality, reduce fatalities and injuries, and at the same time maintain a strong and viable domestic automotive industry.

In 1975 the Secretary of Transportation was requested to lead a task force that would recommend long-range goals for the motor vehicle fleet. A series of panel reports was published along with a draft summary report entitled, "The Report of the Federal Task Force on Motor Vehicle Goals Beyond 1980." The report projected that major changes would be required in both vehicle design and use to accomplish the goals of energy conservation, air quality improvement, and improved safety. Numerous and varied comments on the study were received from industry and from public interest groups. Of particular interest are the comments of the General Accounting Office:[1]

> ...a logical next step...is a follow-up program that would assess the problems and issues raised in the report and would then recommend to the Congress feasible levels and timing of Federal emissions, safety, and fuel economy standards...that best meet the total needs of the nation.

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[1] Federal Register 42:20:5775, dated 31 January 1977.

> ...we believe that this is the...time...to undertake a program designed specifically to resolve the issue of how to best balance Federal automobile standards beyond 1980.

In support of the recommendation to move ahead in further resolving the issues and making implementation recommendations the Department of Transportation has undertaken an Automotive Technology Implementation Study (ATIS). The study is "intended to identify the ways in which the Federal Government can effectively interact with the automobile manufacturers to provide additional incentives for them to rapidly develop and put improved technology into their production cars."[1] The emphasis is on the effects of federal R&D strategies in motivating manufacturers to innovate.

Motor vehicle safety is one area where there has been significant governmental regulation. It was believed that an examination and study of the history of mandatory motor vehicle safety standards would provide insight into possible improvements in automotive technology implementation for the ATIS project. This report examines three safety standards as evaluative cases, and, to the extent possible accomplishes the following:

- describes the key decision and leverage points that exist in the acceptance of safety standards by the automotive industry,
- describes how industry determined its response to each of the standards, and the nature of these responses,
- identifies the relationships that the auto manufacturers' organizational elements (i.e., research, engineering, finance, marketing, etc.) have in the decision processes,
- evaluates the impact of the standards on marketing posture, profitability, and plant utilization,
- identifies where standards have altered the competitive positions between the firms,

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[1] "Questions on Automotive Technology Implementation Study (ATIS)," undated working paper circulated within Transportation Systems Center, Department of Transportation, 6 pp.

- describes changes that occurred in organizational relationships, and
- describes the role and effect that governmental R&D processes had on the manufacturers' implementation of technology.

1.2 METHOD OF APPROACH

There was first an examination of all Federal motor vehicle safety standards, with emphasis on those applying to passenger automobiles. In this examination the following factors were determined:

- date of implementation;
- types of vehicles to which the standard applies;
- the general attitude of the automobile industry toward the standard;
- point of original impetus for the standard; and
- reaction of the industry during proposed rulemaking

From the information thus obtained, three standards were selected for definitive study:

- MVSS 203 -- Steering Column/Impact-- specifies requirements for steering column control systems that will minimize chest, neck, and facial injuries.
- MVSS 212 -- Windshield Mounting-- establishes windshield retention requirements for windshield mountings.
- MVSS 215 -- Exterior Protection-- establishes requirements for the impact resistance and protection provided to front and rear vehicle surfaces.

The steering column/impact standard (203) was selected because (1) it was one of the original standards established, (2) industry considered it a "good" standard, and (3) the research and development which preceded its introduction was performed exclusively by industry.

The windshield mounting standard (212) was selected because (1) it was in the second generation of standards promulgated, (2) industry

considers it an effective standard, and (3) government sponsored most of the research and development.

The exterior protection standard (215) was selected because (1) it has been one of the more controversial standards, (2) resulted in a confrontation between two industrial groups -- automotive manufacturing and insurance --, (3) was a more recently promulgated standard, and (4) both industry and government performed R&D prior to promulgation.

For each of the three standards there was an extensive page-by-page analysis of all docket material pertaining to the original rulemaking and all subsequent amendments. A consultant[1] (Mr. Arch Doty) was retained; he reviewed the history of each of the three standards, and conducted interviews[2] with industry representatives to determine the extent that alternative strategies were considered, and the reasons for their rejection.

Chapter II describes the history of motor vehicle safety, and the attitude of the auto industry relative to the safety legislation.

The three standards are discussed in Chapter III; then Chapter IV analyzes the industry responses to the standards. Chapter V evaluates the effect of the standards on industry; Chapter VI analyzes the role of government in the promulgation process; and, finally, Chapter VII presents the conclusions and recommendations for future investigation.

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[1]Mr. Doty's status is unique in the field of vehicle safety. Until his retirement (February 1, 1977) he was responsible for monitoring all motor vehicle safety standard activities for the Motor Vehicle Manufacturers Association. He filled this position since before the initial Vehicle Safety Act of 1966, and consequently has been intimately involved in the industry's decision processes from the very beginning of vehicle safety standard implementation.

[2]Mr. Doty was asked to conduct the interviews because of his long association with industry representatives.

2. HISTORY OF AUTOMOBILE SAFETY REGULATION

2.1 EVENTS PRIOR TO THE NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT OF 1966

Early advocates of motor vehicles argued that they were much safer than horse-drawn vehicles. A publication directed to early automobile enthusiasts, Horseless Age, stated in 1896: "The motor vehicle will not shy or run away.... The frightful accidents can be prevented. The motor vehicle will do it."[1]

However, the safety argument was not used for very long. In 1899, a New York City businessman was killed near Central Park to become the first known victim of the motor vehicle. From that point on the death toll climbed rapidly, and now is about 50,000/year.[2]

The highway safety movement has continually stressed that there would be few auto accidents if drivers operated their vehicles safely. The automobile manufacturers extended this line of reasoning to argue that since their products were not responsible for accidents, they were under no obligations to design automobiles for this possibility, but merely for safety under normal operating conditions. This argument was accepted, uncritically, not only by the public and the highway safety movement, but by the courts as well. However, there were members of the medical profession and a few other individuals who, upon seeing the results of this policy,

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[1] Horseless Age, June 1896, p. 10, quoted in Styling vs. Safety: The American Automobile Industry, 1973, Ph.D. Dissertation by J. Eastman.

[2] This figure also includes deaths associated with all motor vehicles, i.e., passenger cars, trucks, motorcycles, farm tractors, snowmobiles, etc.

began to call for automobile design that would minimize injuries resulting from what they came to see as the large number of inevitable highway accidents.[1]

The formal recognition by the automobile companies of the need for coordinated programs in automotive safety resulted partially from the result of national pressure concerning accidents and injuries occurring on the highways, and the increasingly strident voices stating the vehicle itself was improperly designed. As one spokesman put it, "it's time we quit spending so much time on the causes of accidents, and to think about the causes of injury."

Gradually, the automobile industry began to assign the responsibility for automotive safety to an individual, or to set up a department.[2] General Motors established a department dealing with automotive safety within its engineering staff about 1950. Chrysler appointed an automotive safety department about 1952 to "enhance the reputation of the corporation in regard to safety"; the department reported directly to Chrysler's vice president in charge of engineering. Ford did not officially appoint an automotive safety engineer until 1955; however, for several years prior to this formal establishment one of their staff engineers, Alex L. Haynes, had been closely following the literature and visiting organizations involved in accident research.

The establishment of the automotive safety groups also resulted from a recognition within the companies that safety aspects should be more actively considered in vehicle design. And, interestingly, this

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[1] Eastman, J., "Styling vs. Safety: The American Automobile Industry." Ph.D.Dissertation, University of Florida, 1973, p. 223.

[2] The earliest coordinated industry safety program started in the 1930's when AMA and the American Association of Motor Vehicle Administration began a formal relationship. Numerous safety developments resulted, e.g., the sealed beam headlight, the amber turn signals. The activity became less important when DOT was organized, and it now deals mainly with periodic vehicle inspection.

concern seemed to first appear at the highest levels of the corporation. Robert S. McNamara, at the time Ford's assistant general manager, strongly supported the move, and the later development of the "safety car." In McNamara's opinion, "automobile accidents were a problem which the industry had a responsibility to deal with and he felt that if it did not, the government might intervene."[1]

And McNamara was right. In 1956 Congressman Roberts of Alabama initiated hearings on certain aspects of automotive safety. The hearings resulted in several pieces of legislation, the most significant of which required certain safety devices to be installed on all automobiles purchased by the federal government.

Probably the most widely-publicized event of the 1960 decade, relative to automobile safety, was the confrontation between Ralph Nadar and General Motors concerning the design of the Corvair automobile. Nader in his book, Unsafe at Any Speed, contended that the Corvair automobile actually contributed to accidents because of dynamic instability in medium-speed cornering situations.

The publicity from the GM-Nader battle served to focus public concern on the question of vehicle safety. And this awareness was soon noticed by Congress. In 1966 the U.S. Senate conducted hearings on automobile safety. Legislation was drafted as a result of the hearings; and, the far reaching National Traffic and Motor Vehicle Safety Act of 1966 was passed that year.

Several important observations can be made concerning motor vehicle safety up to the enactment of the federal legislation:

- The automobile industry generally felt that the central issue of safety was education, rather than design.
- In every confrontation between safety and styling, the latter nearly always won; it was felt that the issue of safety was a depressant to sales; consequently the industry budgeted hardly any funds to safety research.
- In instances where a company attempted to develop a competitive advantage through the implementation of a safety improvement it is difficult to determine if the attempt

[1] Eastman, J. Ibid, p. 279.

paid off; industry generally felt that there had been no gain in position. Some authorities disagree with this position.

- There is no indication that any functional element within the industry was clearly biased toward safer designs; the strongest voices appeared to be within the engineering groups or at top management levels, but the pattern was not consistent.
- There appeared to have been a feeling in the industry that extra costs associated with safer design were not recoverable, i.e., the public was unwilling to pay for them.

2.2 NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT OF 1966

The stated purpose of the National Traffic and Motor Vehicle Safety Act of 1966 (hereafter called "the Vehicle Safety Act") was to reduce traffic accidents and deaths and injuries to persons resulting from traffic accidents. Section 102 of the Act further defines motor vehicle safety to mean "the performance of motor vehicles or motor vehicle equipment in such a manner that the public is protected against unreasonable risk of accidents 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." As seen, only the problem of human loss is addressed; there is no attempt to deal with economic loss. Human injury (or loss) is dealt with in both the pre-crash condition and in the crash phase.

Later the National Traffic Safety Bureau, subsequently renamed the National Highway Traffic Safety Administration (NHTSA), did concern itself with economic loss, in particular the cost of vehicle damage. In 1972 the Motor Vehicle Information and Cost Savings Act (hereafter called "the Cost Savings Act") was passed. This law included a standard setting authority to reduce economic loss, but it was restricted to bumpers. The Administration opposed the bumper provision, indicating that "government intrusion into the marketplace should be limited to matters of necessity involving public health and safety. Nuisance prob-

lems associated with consumer products, such as vehicle damageability, would be most appropriately solved by marketplace processes, aided as necessary by a government information program."[1]

The Vehicle Safety Act is the cornerstone to federal involvement in motor vehicle safety. The key policy points of the Act are:

- Safety standards were selected as the means for dealing with motor vehicle safety.
- Research and development were called for to support standards setting.
- A single agency (now NHTSA) was established to carry out the Act, including standards setting and research program management.

The legislation was passed on March 2, 1966. The legislation set up a new agency (now NHTSA), which set about developing a set of proposed standards. Generally, the agency relied on two sources for the first group of standards: the General Services Administration Standards for governmental vehicle purchase, and a list of proposed standards prepared by the automobile manufacturers. The GSA standards had been developed in 1964 at the direction of Congress and clearly indicated that they (the Congress) expected the manufacturers to add safety equipment for cars used by the government.

The manufacturers' list had been the result of their internal review of all available information to determine what vehicle-related safety standards might be most practicable and could be met by existing technology and production facilities. From these reviews detailed recommendations were prepared and submitted to the government by MVMA acting on behalf of the manufacturers.

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[1] Letter, J.W. Barnum, NHTSA, to C. Weinberger, Director of Office on Management and Budgets, quoted in "Federal Funding of Civilian Research and Development, Volume II: Case Studies." A.D. Little, February, PB-251683, p. 144.

The first group of standards was promulgated on January 1, 1968; Table 2-1 describes these standards, and summarizes the general industry attitude toward each. With only one exception, industry was positive toward all of the standards that were promulgated.[1] The lone exception was MVSS 211 (nuts and disc specifications), which industry considered then, and now, to be a frivolous and non-essential standard. "The standard was written on a whim. There was no analysis of the need for the standard; it was not supported by any responsible professional group, and came as a complete surprise to the automobile industry."[2]

The other standards were supported by the domestic passenger car manufacturers. The industry understood the requirements, saw no significant problems of implementation (most were already incorporated into the vehicles), and foresaw no difficulties in marketing the modifications or performing post-sale service. And, importantly, industry felt the standards would be beneficial and would significantly improve safety performance of the vehicles.

After the initial standards had been promulgated, NHTSA initiated efforts to expand the areas of regulation. This second phase extended over a three-year period, from approximately 1969 through 1971. The public pressure on the automobile industry continued at a very emotional level during this period; however, it began to moderate, especially in the stridency of its tone at the end of this period. The government had overcome the uncertainties associated with a new organization, and were developing independently formulated approaches to safety regulation.

Table 2-2 lists the standards promulgated during this period that were related to the passenger automobile. As seen, most of these regu-

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[1]Also the original 201 standard was fought with a legal action by the industry. The original standard was abandoned as a result of litigation and a more rational standard promulgated. Industry believes this standard is cost effective.

[2]Mr. Arch Doty, consultant, personal interview, February 28, 1977.

TABLE 2-1. Original Passenger Car Standards Promulgated Under the National Traffic and Motor Vehicle Safety Act of 1966.

Standard Number	Description	Development Background	Estimate of Industry Attitude Toward Standard*
101	Control location	Developed from GSA standard	Good standard
102	Shift lever sequence	Developed from GSA standard; industry had earlier standardized on shift sequence	Good standard
103	Defrosting	Developed from existing SAE standard	Good standard
104	Windshield wiping	Developed from GSA standard; devices were installed on all production vehicles prior to standard	Good standard
105	Hydraulic brakes	Developed from GSA standard	Good standard
106	Brake hose	Developed by coordinating several SAE standards	Acceptable standard
107	Reflecting surfaces	Developed from GSA standard	Good standard
108	Lighting	Developed by combining GSA standard with SAE standard	Good standard
109	Tires	Developed from GSA standard	Good standard
110	Tire selection	Developed from GSA standard	Good standard
111	Mirrors	Developed from GSA standards	Good standard
201	Occupant protection	Developed from GSA standard; original proposed standard was poor and lawsuit was instituted by industry; standard was then developed by joint effort between NHTSA and industry	Good standard

TABLE 2-1. Original Passenger Car Standards Promulgated Under the National Traffic and Motor Vehicle Safety Act of 1966 (Continued).

Standard Number	Description	Development Background	Estimate of Industry Attitude Toward Standard*
203	Steering column/impact protection	Developed from GSA standard; original R&D performed at GM; used by two manufacturers before regulation	Excellent standard
204	Steering column/rearward displace	Developed from GSA standard; R&D industry originated	Excellent standard
205	Glazing	Based on American Standard's Association standard; recommended by industry; incorporated into vehicles before regulation	Very cost-beneficial
206	Door latches	Developed from GSA standard, had been incorporated into all standard vehicles before regulation	Cost-beneficial standard
207	Seat anchorages	Derived from GSA standard	Cost-beneficial standard
208	Seat belt installations	Original derivation of standard was current practice of industry	Very cost-beneficial
209	Seat belt assemblies	Derived from Dept. of Commerce regulations	Good standard
210	Anchorages	Developed from GSA standard	Cost-beneficial standard
211	Nuts and discs	Developed without supporting research	Not a rational standard
301	Fuel tank	Developed from GSA standard	Good standard as originally developed (current version is questionable)

*Source for "industry attitude" estimate is an informal working paper prepared by Mr. Arch Doty, consultant.

TABLE 2-2. Passenger Car Standards Promulgated from 1969 to 1971 Under the National Traffic and Motor Vehicle Safety Act of 1966.

Standard Number	Description	Development Background	Estimate of Industry Attitude Toward Standard*
112	Headlamp Concealment	Based on thinking at NHTSA	Nuisance-type standard
113	Hood latches	Basic were existing SAE standards	Good standard
114	Theft protection	Based on thinking at NHTSA	Good standard
115	Vehicle identification numbers	Based on existing system used by industry	Good standard
116	Brake fluid	Based on SAE standards	Good standard
117	Retreaded tires	Based on thinking at NHTSA	Questionable benefits
118	Power windows	Based on thinking at NHTSA--all manufacturers in conformance before issues	Questionable need for a standard
202	Head restraints	Developed from GSA standard	Questionable benefits
212	Windshield mounting	Developed as result of request for NHTSA comments	Cost-beneficial standard
213	Child seating systems	Developed by NHTSA	Good standard

*Source for "industry attitude" estimate is an informal working paper prepared by Mr. Arch Doty, consultant.

lations were the product of internal NHTSA thinking. Likewise, they are considered by industry to be of less benefit than were the original standards; four of the ten were considered to have questionable value. None of the standards were considered to be of such poor quality that industry contemplated any serious action to defer or to eliminate the proposal. Most of their critical comments were directed toward a need to have a longer period to prepare for implementation, or toward further assessing the benefits of the standard.

The final group of standards were those promulgated after 1971. By this time the NHTSA team was fully staffed, and the earlier standards had been operational sufficiently long to have been totally evaluated. Also, and significantly, during this period, the automobile industry received unexpected support from the energy crisis. The industry could now say, and people would listen, that certain additional safety devices added weight to the vehicle, which increased fuel consumption. The industry now had an effective and telling argument to support its contentions. They used it too; almost every docket since 1973 has contained presentations in this regard if there was the slightest suspicion that the regulation would result in a vehicle weight increase.

Table 2-3 lists the totally new standards that have been promulgated since 1971. Generally, the industry's attitude is not as positive toward these standards as toward those introduced earlier. Though the industry feels the standards are not as beneficial, concerns have not been sufficiently strong to resort to litigation. In one instance though, indications are that litigation was seriously considered. The standard involved was MVSS 215, "Exterior Protection."

In summary, there is no question but that the automobile industry has responded positively toward regulations imposed by the Vehicle Safety Act of 1966. Table 2-4 shows its current attitude toward the standards. Thirty of the 46 standards are considered "good" or "acceptable"; eight are of "questionable value"; only two are considered "nuisances." The industry had no opinion or felt it was too early to know the benefits/cost relationships for six of the standards.

TABLE 2-3. Passenger Car Standards Promulgated from 1972 to Present Under the National Traffic and Motor Vehicle Safety Act of 1966.

Standard Number	Description	Development Background	Estimate of Industry Attitude Toward Standard*
105-75	Hydraulic brakes	Developed from GSA standard	Good standard
119	Tires	Based on tire and rim association standards	Good standard
120	Tire selection	Based on tire and rim association standards	Good standard
124	Accelerator control system	Based on NHTSA thinking	Questionable value
125	Warning devices	Derived from Bureau of Motor Carrier Safety	Unknown value
214	Side door strength	Based on work done by GM	Insufficient data; some are skpetical
215	Exterior protection	Derived from SAE standard	Questionable value
216	Door crush resistance	Derived from existing SAE standard regarding rollover	Questionable value
219	Hood intrusion	Developed from NHTSA thinking	Insufficient data
302	Flammability	Derived from FAA standard	Does not appear to be cost effective

*Source for "industry attitude" estimate is an informal working paper prepared by Mr. Arch Doty, consultant.

TABLE 2-4. Industry Appraisal of MVSS Standards versus the Development Source.

Development Source	Industry Appraisal (number of standards)					
	Good	Acceptable	Questionable	Nuisance	Unknown	Total
Government	21		5	2	5	33
Industry	4		1			5
Other	4	1	2	-	1	8
Total	29	1	8	2	6	46

Source: Tables 2-1, -2, -3.

A cursory examination of the standards considered by the industry to be of questionable or nuisance value indicates that the following conditions prevailed:

- Promulgation was hasty and without significant R&D.
- Standard is of recent history.
- Industry was not involved in the problem definition.

For the above reasons, the standards were closely examined to select three specific cases for further study that in some way reflected variations of these attributes. The selections were:

MVSS 203 - Steering Wheel/Impact. This standard was part of the original group of standards; is considered to be a good standard by industry; was preceded by lengthy industry R&D; and promulgation occurred fairly quickly.

MVSS 212 - Windshield Mounting. This standard was part of the second generation of standards; the development occurred exclusively within NHTSA; promulgation occurred at moderate speed; and industry considers it an effective standard.

MVSS 215 - Exterior Protection. This has been a recent promulgation; has been a very controversial standard; it involves the Cost Savings Act "economic benefit" clauses; it is considered of questionable value by the automobile industry, and litigation was contemplated; and it has had significant R&D both by government and by industry.

3. CASE STUDY OF THREE MOTOR VEHICLE SAFETY STANDARDS

3.1 MVSS 203 -- STEERING COLUMN IMPACT STANDARD

This standard was one of the initial standards (Table 2-1). The standard's purpose was to "specify requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact."[1]

The standard specifies that when the steering control system is impacted by a body at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body shall not exceed 2500 pounds. Additionally, the steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

Because of the very limited time allowed by Congress for implementation of the initial standards, the MVSS 203 standard was a rewrite of the General Service Administration 515/4a standard. The GSA standard was developed as a result of research studies conducted by vehicle laboratories (primarily at Cornell Aeronautical Laboratories) several years earlier. These studies indicated that one of the highest "payoff" areas, in terms of injury and fatality, would be the development of energy-absorbing steering columns. Work was initiated by the manufacturers (primarily at Saginaw Steering Division of General Motors), and by the time MVSS 203 was considered, the manufacturers had conducted over eight years of research and development on energy-absorbing steering columns. Additionally, all GM vehicles and some Chrysler vehicles were already being equipped with steering columns that met the MVSS 203 specifications.

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[1] Federal Register 32:2414, February 3, 1967.

Table 3-1 describes the actions that have occurred relative to the standard.

The original standard was proposed in 1966, and adopted in 1967.

A major amendment was proposed in 1970 that would have made the standard much more stringent. It would have increased the impact velocity from 15 mph to 20 mph, and reduced the force of impact from 2500 pounds to 1200 pounds. The proposal was finally dropped because presentations from industry caused NHTSA to conclude the proposed changes were unreasonably severe.

The only amendment that has actually been adopted was one proposed by General Motors in 1974. This amendment permitted the exemption of selected vehicles from MVSS 203 to permit the development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements of standard 208.

Ford Motor Company stated in their response to the proposed rulemaking on the initial standard:[1]

> We fully support the purpose of the National Traffic and Motor Vehicle Safety Act. Ford Motor Company is committed to a continuing unreserved effort to increase highway safety...
>
> Public comments by some members of the industry after the publication of the proposed standards have led many observers to conclude that the automobile industry is recalcitrant, or against safety, or poorly managed if it cannot incorporate the safety requirements called for under the standards. This is not so. The most serious problem in most cases is that the manufacturers cannot incorporate changes to conform with many of the standards in the time permitted.
>
> One tragic consequence of an administration of the Act that fails to honor established industry practices with regard to lead time is the defensive engineering posture the manufacturers would be forced to assume in an attempt to ensure their ability to continue their business operations without chaotic dislocation...

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[1] Letter, Will Scott, Ford Motor Company, to W. Haddon, Jr., National Traffic Safety Agency, January 1, 1967, with attachments (Docket #3, Notice #1).

TABLE 3-1. Summary of Actions on MVSS 203.

Date	Reference Federal Register Volume	Page	Description of Action
December 3, 1966	31	15219	Notice of proposed rulemaking for standard.
February 3, 1967	32	2408-10	Rule promulgated into a standard.
October 14, 1967	32	14278-80	Proposal to extend the standard requirements to include a maximum chest pressure and a specification for rate of onset of force. Dropped.
September 25, 1970	35	14940-41	Proposal to change the body block force to 1800 pounds, and the rate of impact to 20 mph, with the impact force not to exceed 1200 pounds. Proposal was never adopted.
September 23, 1974	39	34062	Proposal to exempt vehicles that conform to MVSS 208, so that airbags might be deployable. Adopted.

The above excerpt generally expressed the viewpoints of all the domestic manufacturers. It indicated (1) their commitment to highway safety, (2) their main problem being one of time allowed for compliance, and (3) their concern with the need to resort to "defensive engineering."

And so the initial standard was adopted. The manufacturers made their necessary production adjustments, and the complying vehicles began to appear with the 1969 model year.

Even while the basic promulgation was proceeding, the government began to develop an amendment. It would further define the maximum pressure that could be exerted by the column at the chest. The industry's response was immediate and sharp.

The Automobile Manufacturers Association submitted extensive comments on the proposed amendment. The comments indicated strong support of the existing system. Additionally, Chrysler in a separate submission stated:

> ...The present capability of our energy-absorbing steering control systems should not be jeopardized by an arbitrary rate of onset requirement until more human tolerance data are firmly established and an optimum balance in the best interests of safety can be assured.[1]

Volkswagen of North America questioned whether it was possible to accurately determine the pressure in the area of impact between the driver's chest and the steering control system.

As a result of docket submissions, the government reconsidered its position and decided not to adopt the proposed rule.

In 1970 the government proposed another amendment, which would change the body block force and rate of impact. This proposal was

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[1] Comments by Chrysler on Advanced Notice of Proposed Rule Making, Docket 2-3, Notice 67-5.

the most controversial of any submitted relative to this standard. The proposal would increase the impact specification from 15 mph to 20 mph; at the same time there would be a reduction from 2500 pounds to 1800 pounds for the force on the body block.

The response of every manufacturer was emphatic; they indicated the following:

- There were no data that would substantiate the need for a change; all published information indicated the existing system provided a high level of protection.
- There is no established and accurate procedure for measuring impact area under dynamic conditions; there were also other difficulties indicated in defining the specifications.
- Design conflicts would occur between the passive restraint system and the redesigned steering column system; they were proposed for implementation within six months of each other.

After consideration of all comments the government decided to abandon the proposed rule change.

The next amendment was proposed at the suggestion of General Motors, to "permit the development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements of standard 208."[1] General Motors sought the exclusion because conformity with MVSS 203 would be made difficult as a result of the redesign needed to install the air cushion system.

With only one exception all manufacturers who commented supported the proposed amendment. The exception, American Motors, suggested that the exception not be granted until such time as the future requirements of MVSS 208 could be firmly established.

A part of General Motor's presentation was the extent of financial commitment necessary for the development of the passive restraint

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[1]Preamble to Amendment to Motor Vehicle Safety Standard No. 203, "Impact Protection from the Steering Control System." Part 571: S203-PRE-1.

system, and the need to have government assurances that the steering column standard would not be an obstacle to the restraint system development.

The government agreed that the request was reasonable, and did not find sufficient reason from invited comments to defer granting of that request. Consequently in May 1975, the MVSS 203 standard was amended to exclude from its requirements some passenger cars which meet the frontal barrier crash requirements of MVSS 208, "Occupant Crash Protection." The basic standard and amendment are a part of the appendix.

3.2 MVSS 212 -- WINDSHIELD MOUNTING

The MVSS 212 standard was one of the "second generation" of promulgations. It was evolved after the hectic period when initial standards were developed, and was thus in an era when the effects of the initial standards were beginning to be felt within NHTSA, and logical extensions of the original standards were being developed.

MVSS 212 was, in part, an extension of an original standard, MVSS 205, which laid down requirements for various types of glazing utilized in motor vehicles, including windshields. In effect, MVSS 212 was to extend the effectiveness of the windshield requirements of MVSS 205 by assuring that the windshield itself was retained in an accident; it (the windshield) was to be a "safety net" to prevent unrestrained passengers from being ejected.

The basic standard was published on August 16, 1968, as indicated in Table 3-2. The date of implementation was set at January 1, 1970. From then until the present time the government has continued to propose modifications and amendments. One proposed change has been to expand the standard's applicability to almost all vehicles less than 10,000 pounds GVW. This proposed change has been to make the testing procedure the same as that required for

TABLE 3-2. Summary of Actions on MVSS 212.

Date	Reference: Federal Register Volume	Reference: Federal Register Page	Description of Action
December 28, 1967	33	20865-66	Notice of proposed rulemaking - Basic Standard.
August 16, 1968	33	11652-53	Rule, basic standard.
December 24, 1969	34	20212	Notice of proposed rulemaking: extend the applicability to all multi-purpose vehicles. Amendment, definition classification. Dropped.
July 14, 1970	35	11242-80	Notice of proposed rulemaking; expansion to include vehicles up to 10,000 lb GVW; make 75% retention requirement necessary for all test procedures; modify vehicle loading to facilitate simultaneous testing with MVSS 208. Dropped.
January 18, 1974	39	2274-75	Notice of proposed rulemaking; expansion to include vehicles up to 10,000 lb GVW; make 50% retention requirement necessary under all test procedures; extension test temperature conditions; make vehicle loading consistent with MVSS 208 conditions. Dropped.
August 30, 1976	41	36493-94	Amendment. Excluded open-body type vehicles.

MVSS 208, "Occupant Crash Protection," and there were also suggested changes in the extent of windshield retention that would be permitted.

In the seven years since the standard has been promulgated, there have been three separate attempts to amend the original standard, as indicated in Table 3-2. As yet, no proposal has ever been adopted, and the original standard still stands without change.

Examination of the dockets relating to the proposed rule ing of the basic standard and the amendments indicated the following:

- The U.S. passenger car manufacturers generally supported the purpose of the standard, and indicated an ability to comply, in all instances; however, they indicated a need to have a longer time period to prepare for compliance than was proposed.

- The foreign manufacturers unanimously questioned the safety benefits offered by the standard (the European safety experts generally believed that a "pop-out" windshield was preferable to a retained windshield).

- Special-purpose vehicles and trucks would have great difficulty in meeting the standard because of unusual torsional conditions that exist in the operation of these vehicles.

- Promulgation dates should be consistent with model changes.

Because the improved windshield requirement specified in MVSS 205 was already being followed, the U.S. passenger car manufacturers had developed an awareness of the safety costs and benefits possible in the windshield area. They had developed a sensitivity and sympathy toward the standard's objectives. Additionally, industry did not feel that implementation costs, production engineering, or marketing effects would be a problem. As a result, the standard has continued to be viewed as cost-beneficial.

3.3 MVSS 215 -- EXTERIOR PROTECTION

The MVSS 215 standard has had one of the most controversial implementation histories of any standard. Among other things, it has led to a confrontation between two major U.S. industrial sectors: the insurance industry and the automobile manufacturing industry. And, for the first time, economic benefits replaced safety benefits as the major basis for decision making in the promulgation of a standard.

This standard establishes requirements for the impact resistance and protection provided to front and rear surfaces of the automobile, and is commonly known as the "bumper standard."

Early bumpers on U.S.-produced vehicles were designed purely to protect the vehicle bodywork from damage. They were made of spring steel, and probably had a negative safety value.

With the sophistication of vehicle bodywork in the 1950's and 1960's the bumper was treated more and more as a styling adjunct than a protective device. Bumpers became so integrated into vehicle bodywork design that even low-speed impacts could be expected to result in damage to vehicle safety devices such as headlamps, turn-signals, light markers, etc., and to result in expensive damage to body sheet metal. One of the major reasons for imposition of MVSS 215 was the impact that front- and rear-end collisions had on those devices important for safe vehicle operation.

The announcement by NHTSA of a proposed bumper standard was not greeted with enthusiasm by vehicle manufacturers because of the type of standard being considered. And, the short time proposed for implementation, they feared, would pose serious problems involving vehicle engineering and vehicle assembly.

NHTSA's rulemaking process of MVSS 215 has been studded with advance notices of proposed rulemaking, revisions, and corrections, as seen in Table 3-3. But the original standard was the most traumatic to the industry. The manufacturers were faced with a short implementation time of a standard that dealt with basic vehicle structures. As a result the revisions needed for

TABLE 3-3. Summary of Actions on MVSS 215.

Date	Reference Federal Register Volume	Page	Description of Action
November 24, 1970	35	17999-18001	Initial NPRM
April 16, 1971	36	7218-20	Adopted with effective dates 9-1-72 and 9-1-73 Changes from initial NPRM include: 1. Allowing fixed barrier tests for 1972 (instead of pendulum tests). 2. Reducing 1972 requirements from 4 to 2 1/2 mph for the rear. 3. Reducing corner impact angle from 45^{o} to 30^{o} from longitudinal. 4. Raising minimum test height from 14" to 16". 5. Allowing 30 minute intervals between impacts.
June 22, 1971	36	11868-69	Propose reducing corner impacts from 5 mph on front and 4 mph on rear to 3 mph for all corners. Adopted for 9-1-73 requirements. Propose raising rear standard from 4 mph to 5 mph. Adopted for 9-1-73 requirements. Proposes that engine must be running during impact test. Adopted for 9-1-73 requirements. Changed to read, "must be running during onset of impact." Proposes that no damage can occur on any safety-related equipment. Adopted for 9-1-73 requirements.

TABLE 3-3. Summary of Actions on MVSS 215 (Continued)

Date	Reference Federal Register Volume	Page	Description of Action
October 21, 1972	36	20369	Proposes that vehicles with wheelbases under 115" be exempted for one year from pendulum tests. Adopted for 9-1-73 requirements.
			Proposes delaying corner impact requirement of impacts lower than 20" until 9-1-75. Adopted for 9-1-73 requirements.
January 22, 1972	37	1059	Proposes trailer hitches may be removed before testing. Adopted for 9-1-72 requirements. Denied 8-19-72.
July 9, 1974	39	25237-40	Proposes testing requirements that would allow the use of soft bumpers. Adopted for 9-1-75.
August 15, 1974	39	29369-70	Clarifies 9-1-73 requirements. Allows the release of gas or hydraulic pressure on impact.
August 16, 1974	39	29600-01	Proposes extending the exemption for vehicles with wheelbases under 115". Adopted until 10-31-74.
August 15, 1974	39	29369-70	Proposes front and rear impacts at 5 mph and corner impacts at 3 mph for 9-1-75. Dropped.
January 2, 1975	40	10-12	Proposes reducing current standards to 2 1/2 mph for front and rear, and 1 1/2 for corners. Dropped.
			Proposes reducing impacts to 3. Adopted 5-13-75.
January 2, 1975	40	10-12	Proposes stringent requirements for 1978-1979, stipulating virtually no damage at all.

TABLE 3-3. Summary of Actions of MVSS 215 (Continued)

Date	Reference Federal Register Volume	Page	Description of Action
March 12, 1975	40	11598-601	Proposes "Chrysler Amendment." Adopted 5-13-75.
			Proposes stricter interim requirements than those of 1-2-75. 5 mph front and rear, and 4 mph on corners. Adopted 5-13-75.
March 4, 1976	41	9374	Proposes modification of MVSS 215 on Part 581 so that soft bumper material may be used.

conformance could not be phased in during the normal research, development, and tooling schedules. It was thus necessary to make "fixes" in order to meet the mandated implementation date. The "fixes" included use of off-the-shelf hydraulic shock absorbing components, that were tacked on in almost "Rube Goldberg" fashion. The results were vehicles that:

- were more costly,
- were approximately 100 pounds heavier,
- were less attractive, and
- were inconvenient because of increased length.

In the years since the original imposition of the standard all of the above problems have been reduced, but not eliminated, through incorporation of the bumper requirements into the basic vehicle structure, and through the usage of lighter weight materials.

Industry's strong reaction to the basic standard would be typified by Chrysler's docket submission to the initial NPRM. They stated:

> Petitioner's (Chrysler) position that standard 215 is not an appropriate Motor Vehicle Safety Standard is based on the following:
>
> 1. The Administration has failed to give due consideration to leadtime requirements necessary for engineering development, testing and tooling of bumpers and related vehicle structures which are required to meet the provisions of the standard applicable to 1974 and later model passenger cars.
> 2. Standard No. 215 prohibits the vehicle from "touching" the specified test device except on the impact ridge. Such a requirement is unnecessarily restrictive and does not meet the need for motor vehicle safety.
> 3. The requirements in Standard No. 215 specifying the shape of the nose of the pendumum-type test device are unreasonably and excessively severe and, therefore, such requirements are impracticable and do not meet the need for motor vehicle safety.

4. The corner impact speed requirements in Standard No. 215 are unreasonably severe and could result in a condition which would be detrimental to safety.

5. The height requirements for corner impacts set forth in Standard No. 215 are unreasonably severe and could adversely affect motor vehicle safety.[1]

But the trauma caused by the initial standard was only the beginning. In 1973 the NHTSA published a notice proposing the establishment of a new bumper standard to be issued under the authority of Title I of the Motor Vehicle Information and Cost Savings Act. This Act permitted the government to evaluate the bumper standards on both an economic benefit basis and on a safety benefit basis. With the introduction of economic benefits as an evaluative criteria, industry's responses to rulemaking began to contain discussions of costs, and non-safety benefits.

General Motors said in its docket response to the proposed rule:

> ...It would...appear that the intent of Title I (reduction of consumer economic loss) cannot be met by a standard which achieves the objective of reducing low speed collision losses while simultaneously causing a disproportionate increase in initial cost and operating expenses. As the primary objective of the Act is to reduce overall consumer costs of vehicle collision losses, it is imperative that a comprehensive benefit - cost analysis be conducted...[2]

General Motors goes on to indicate that they had performed an economic study of the standard. One of their conclusions was, "the benefit-cost analysis indicates that the additional benefits to the consumer are less than the additional costs for the 1973 exterior protection system for the first year."[3]

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[1] "Petition for Reconsideration," Chrysler Corporation, Docket No. 1-9 and 1-10, Notice 4, Department of Transportation, May 1971.

[2] General Motors Addendum to Petition for Amendment of MVSS 215, USG 1045, Part II.

[3] Ibid.

There was no doubt about it; industry felt (and still feels) the standard was of questionable safety and economic value. And, it has raised the retail cost of an automobile more than any other vehicle safety standard. Mr. Lee A. Iacocca, Ford Motor Company President, indicated in a letter to Senator Domenici that MVSS 215 had added over $100 to the retail price of an automobile through the 1975 model year.[1] (This figure is sufficiently large to adversely affect automobile demand between one and two percent, based on estimated elasticity relationships between auto demand and vehicle sales price).

In summary, the industry feels that MVSS 215 is an excellent example of how not to promulgate a federal requirement. The industry felt it was too hastily conceived. They felt it would pose serious problems concerning vehicle engineering, component manufacturing inventory, and vehicle assembly; and, they were concerned with the negative impact it would have on finance, marketing, and profitability. Their concerns proved justified on every count.

[1] Letter, Mr. Lee Iacocca, Ford Motor Company, to U.S. Senator Pete V. Domenici, dated May 13, 1975.

4. ANALYSIS OF INDUSTRY RESPONSE TO VEHICLE SAFETY STANDARDS

4.1 GENERAL BACKGROUND

Over 10 years have passed since the passage of the Motor Vehicle Safety Act. In that period of time there have been major changes in (1) industry's attitude toward government regulation, and (2) the public's feelings toward the automobile industry.

At the onset of regulation the industry was nervous in its relationships. On one hand it initiated a bitter and acrimonious lawsuit against the government to have the original MVSS 201 standard set aside. And, even though it won the battle, many feel that such a confrontation between government and industry would not occur today.[1] At the same time, though, and the MVSS 201 controversy notwithstanding, the industry in the early days also exhibited some unusually cooperative attitudes. When the Vehicle Safety Act was passed, industry submitted to the government (through the AMA) a list of 11 proposed safety standards. The auto manufacturers designated senior engineers on their staffs to cooperate with government officials in working out safety standard details. They also committed large sums of money for vehicle safety research and development.

But there was uncertainty and ambivalence within the automobile industry toward governmental regulation. In a letter dated January 1, 1967, Ford Motor Company begins its submission to Docket No. 3, Notice 1, as follows:

> We fully support the purpose of the National Traffic and Motor Vehicle Safety Act. Ford Motor Company is committed to a continuing, unreserved effort to increase highway safety.

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[1] Doty, Arch, op.cit.

There is no reason to doubt the sincerity of this assertion. Ford did not say they supported the Act; they said they supported the purpose of the Act -- human safety -- and that any disagreements they may have with the government on proposed standards would be with the standards themselves, not the safety needs to which they are addressed.

Having stated its interest in human safety, Ford goes on, in this lengthy and interesting document, to discuss in detail its interpretation of the new law and its effect on Ford. Though ostensibly a response to the 23 initial standards, the letter is a much broader attempt to clarify the relationship imposed by the legislation and to set up ground rules for the implementation of it.[1]

Ford's interpretation is a strict one, and its discussion of the Act is a checklist of criteria to be applied to any proposed standard before it may be said to conform to the provisions of the Act. The first of these, and apparently the most important, is that "each standard must be clear and precise." Regarding the 23 initial standards, Ford wrote:

> One of the most pervasive and distressing aspects of the standards is the need to make one or more interpretive assumptions with respect to the standard before Ford can even consider whether its products will meet the standard or could be altered to meet it. ...It is an established principle that any regulation having the force of law must be clear, precise, unambiguous, and fairly susceptible of only one interpretation, if a penalty is to be invoked for its violation.

Other statutory criteria (must be practicable, must be a performance standard, must meet a need for traffic safety, etc.) are listed and discussed as they relate to the proposed initial standards.

In the same document, Ford discusses its fear concerning the power given to the National Traffic Safety Bureau, and quotes Con-

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[1] The complete text of the section dealing with standard requirements is contained in the appendix.

gressman Harvey's speech in the House during the final consideration of the bill:

> ...Some of this concern from those in the auto industry comes about because of the very vast discretion that is turned over to the Secretary in this particular bill.
>
> Mr. Chairman, this is something that I cannot think of any way to get around. We must empower him with the authority to get out these particular standards. Whether the Secretary truly understands when we talk of the model year -- whether he truly understands when we talk of the leadtime necessary in new model production and comprehends -- these things are tremendously important, not only to the automobile industry but to all of our country.

This, then, is the real thrust of Ford's remarks. There is suddenly a piece of law which regulates them, and they can interpret it exactly, and insist that the government interpret it exactly, and continue to insist on a rigid interpretation even down to the present day. They didn't necessarily expect it to happen that way. Their understanding of law is somewhat more sophisticated, and even in 1967 they are aware that to expect a static administrative posture from the government is unrealistic. What they <u>did</u> expect, and what they felt they needed, was understanding. Thus, Ford's response (and that of other companies) to the initial standards is an attempt to educate the government in the workings of the automotive industry. Lead times are explained in extraordinary detail; costs of retooling are discussed; the entire process of designing an automobile is laid bare for the government in the hope that a sensitivity to industry concerns would develop.

After this initial phase, relations normalized somewhat. In the case of the windshield retention standard (MVSS 212), proposed 5-16-68, the docket entries involve various objections to the specific standard, rather than theses on the nature of the car business. It appears that after the first push to educate the NHTSA, manufac-

turers adopted a wait-and-see attitude. They had not given up to NHTSA. They believed they were facing, if not sympathy, then at least a lack of antipathy, but they had not yet decided on strategies. They had no idea what sort of response would get attention and which would not. This period may be characterized as a time when no one wanted to throw the first stone.

Later, by the time the bumper standard (MVSS 215) was first promulgated in 1971, this had changed and distinctive corporate personalities began to appear. One remained sober, businesslike, detached. A second firm became increasingly vituperative and unyielding. The first discusses; the second petitions. A third firm is somewhere between them -- firm, but still businesslike.

The auto industry learned that exemptions would be granted for special and peculiar economic reasons. When GM, for example, pointed out that a work stoppage in one of its plants would prevent it from using scarce materials unless the requirement for pendulum testing (of bumpers) on certain vehicles was delayed, the NHTSA was understanding. The meaning of the NHTSA's attitude on economic considerations like this was not at first clear, though companies were grateful for whatever relief they could get. What it meant, apparently, or what it came to mean, as AM discovered to its chagrin, was that the NHTSA sees itself as a regulator of the marketplace as a whole, rather than simply the items placed on sale. This was apparent when, at Chrysler's request, the NHTSA exempted (for one year) vehicles with wheelbases over 120 inches from low-corner impact requirements. American Motors complained that this put AM at a competitive disadvantage. The NHTSA then explained, in an extraordinary statement, that this was precisely the point:

> The proposal to delay the low-corner impact requirements until 9-1-76...was based solely on an intent to provide Chrysler with some relief from the serious financial difficulties it is now experiencing.[1]

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[1]Federal Register 40:159, pp. 34347-48.

4.2 OBJECTIONS TO THE THREE STANDARDS

Objections of motor vehicle manufacturers to MVSS 203, 212, and 215 fall into three broad categories--definitional, economic, and special problems.

Definitional objections are those concerning the meaning of the standard, the justification for it, and the testing procedure to be used. This is an area of critical concern for manufacturers and it is in this area that their remarks exhibit the most frustration. Companies feel that the NHTSA should know what it wants and why it wants it. Indeed, when this sort of firm statement is lacking, they attempt to define it themselves in their comments. Performance standards may be difficult and expensive to satisfy, but once they are firmly promulgated and thoroughly understood, they represent a definite goal and a challenge. Vagueness, however, or the perceived absence of a relationship between the proposed standard and an increase in human safety, is a source of frustration.

All three standards were attacked on the ground that they did not address a recognized safety objective. At times, the industry argument was simply that experimental data were insufficient to justify a safety standard. In the case of MVSS 212, however, studies were cited indicating that windshield retention ran counter to the interests of safety. And concerning MVSS 215 (bumpers), manufacturers objected that human safety was not served by the proposed standard. (Manufacturers never miss an opportunity to point out that the 1966 National Traffic and Motor Vehicle Safety Act dealt with human safety, not damage to vehicles or repair costs.) Regardless of the specific objections, Chrysler's statement that "...it is important that clearly stated specific safety objectives be furnished" would meet little disagreement in the car industry.

Also included in this category are objections to technological constraints inherent in or implied by proposed standards. The NHTSA, it was pointed out in the docket responses, should not put itself in

the position of discouraging industry research in "soft" energy-absorbing bumpers, for example, or new types of windshield glass. The development of new methods may contribute significantly to human safety, yet be in violation of safety standards. Also, from a practical business standpoint, companies want to be in a position to decide, at the earliest possible date, whether to refine existing technology or develop entirely new solutions.

Economic objections are those dealing with lead time, the expense of testing procedures, and other miscellaneous problems affecting most vehicle manufacturers more or less equally.

Explanations of lead time requirements are the most common responses of motor vehicle manufacturers to proposed standards. Often these explanations are minutely detailed and quite lengthy. Their schedules are important to them. Indeed, one almost gets the feeling that manufacturers would have no objection to any standard as long as they were given adequate lead time.

Related to lead time objections were responses that sought a more lenient standard. Manufacturers rarely claim that a proposed standard is impossible to meet. Rather, they relate changes to the time required to effect them. A small change could be made more quickly than a large one. This means they are often more interested in the effective date of a proposed standard than the standard itself. They tend to look at the date and decide what they can do within that time, rather than look at the proposed standard and determine when they can comply with it as written.

The expense of testing procedures is another concern, especially for manufacturers of a limited number of expensive vehicles. Truck manufacturers, for example, were aghast at the prospect of barrier collision tests to determine the ability of their products to retain windshields.

It is in the nature of the standard maker to impose uniformity. However, it is in the competitive interest of car companies to preserve their differences. Hence, manufacturers frequently empha-

size the special problems regulations create for them in relation to specific makes and models--and request delays, exemptions, and leniency of enforcement.

Often these objections come from foreign or small American manufacturers of trucks, sportscars, and special-purpose vehicles. Since it is the very uniqueness of their designs and the special functions performed by their products that create their market, they are wary about any regulations which might tend to minimize the differences between themselves and the major manufacturers.

Another problem was that, while modifications by a major manufacturer to bring his products into line with a proposed standard could be costly and time-consuming, the same modifications for a small manufacturer could be apocalyptic. Instead of "difficulties" or "expenses," they spoke of the "extinction of certain types of vehicles" and pointed out this was not the intent of the 1966 National Traffic and Motor Vehicle Safety Act.

Specific Responses to the Three Standards

- DEFINITIONAL

  Steering column (MVSS 203)

  1) Insufficient data to justify standard.
  2) Overlapping of standards (203 and 208) causes confusion and inconvenience.

  Windshield retention (MVSS 212)

  1) 75% retention is difficult to measure.
  2) Does the standard contribute to safety? (A Swedish regulation is cited which mandates the opposite.)
  3) Must be performance standard.
  4) Proposed standard discourages development of new and safer types of windshield glass.
  5) If you wear your seatbelts, the windshield question is irrelevant.

Bumpers (MVSS 215)

1) Insufficient data to justify standard.
2) Bumper height standards are restrictive of design.
3) Standard not related to human safety.

- ECONOMIC

Steering column (MVSS 203)

1) Effective date too soon. Need more lead time.
2) More lenient interpretation suggested.

Windshield retention (MVSS 212)

1) Need more lead time.
2) Can be done but it costs too much to do it so quickly.
3) Barrier collision tests are too expensive, especially for a small manufacturer.

Bumpers (MVSS 215)

1) Need more lead time.
2) All related standards should be introduced together.

- SPECIAL PROBLEMS

Windshield retention (MVSS 212)

1) Truck windshields must be replaced frequently.
2) Vehicles built for off-road use undergo unusual stresses requiring the installation of pop-out windshields.

Bumpers (MVSS 215)

1) Bumper heights must be different, according to the function of the vehicle.
2) Standards which lead to the extinction of certain types of vehicles are in conflict with the intent of the National Traffic and Motor Vehicle Safety Act of 1966.
3) U.S. standards should not be incompatible with international standards.

4.3 INDUSTRY RESPONSE DEVELOPMENT

4.3.1 Organizational Structures

Without exception the development of responses to proposed rulemaking has been coordinated by the highest management levels within the automotive manufacturing firms. At Ford, for example, the chairman of the board is regularly briefed on matters relating to vehicle safety standards, and all of the other areas of governmental regulation.[1] Almost all material submitted into the docket from Chrysler Corporation is sent by an executive of vice-presidential rank. At General Motors the safety standards activity is assigned to environmental staff, which is headed up by a corporate vice president.

Typical of the corporate organizations relating to vehicle safety are those of Ford and Chrysler. Ford's organizational structure is simple and straightforward, shown in Figure 4-1. The responsibility for vehicle safety is assigned to the vice-president for engineering (Misch). His staff is responsible for monitoring all vehicle safety activities. When a notice of proposed rulemaking appears, they supervise the preparation of the responses, coordinating all inputs from throughout the corporation. Strategy decisions are the ultimate responsibilities of the company's president (Iacocca) and his staff.

Chrysler's organization is a more complex structure, as seen in Figure 4-2. It is similar to Ford's in that the company's strategical decisions are made by the president (Riccardo), in agreement with three senior vice presidents (Butts, Ford, Cafiero). Mr. Sidney Terry, vice-president, and his staff have the responsibility of coordinating all public presentations of the company's position relative to safety. Mr. Butts, vice president of product

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[1] Mr. Arch Doty, op cit.

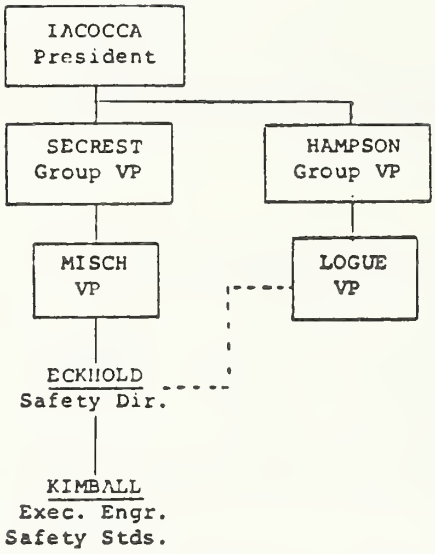

FIGURE 4-1

ORGANIZATION CHART

FORD MOTOR COMPANY

CORPORATE SAFETY

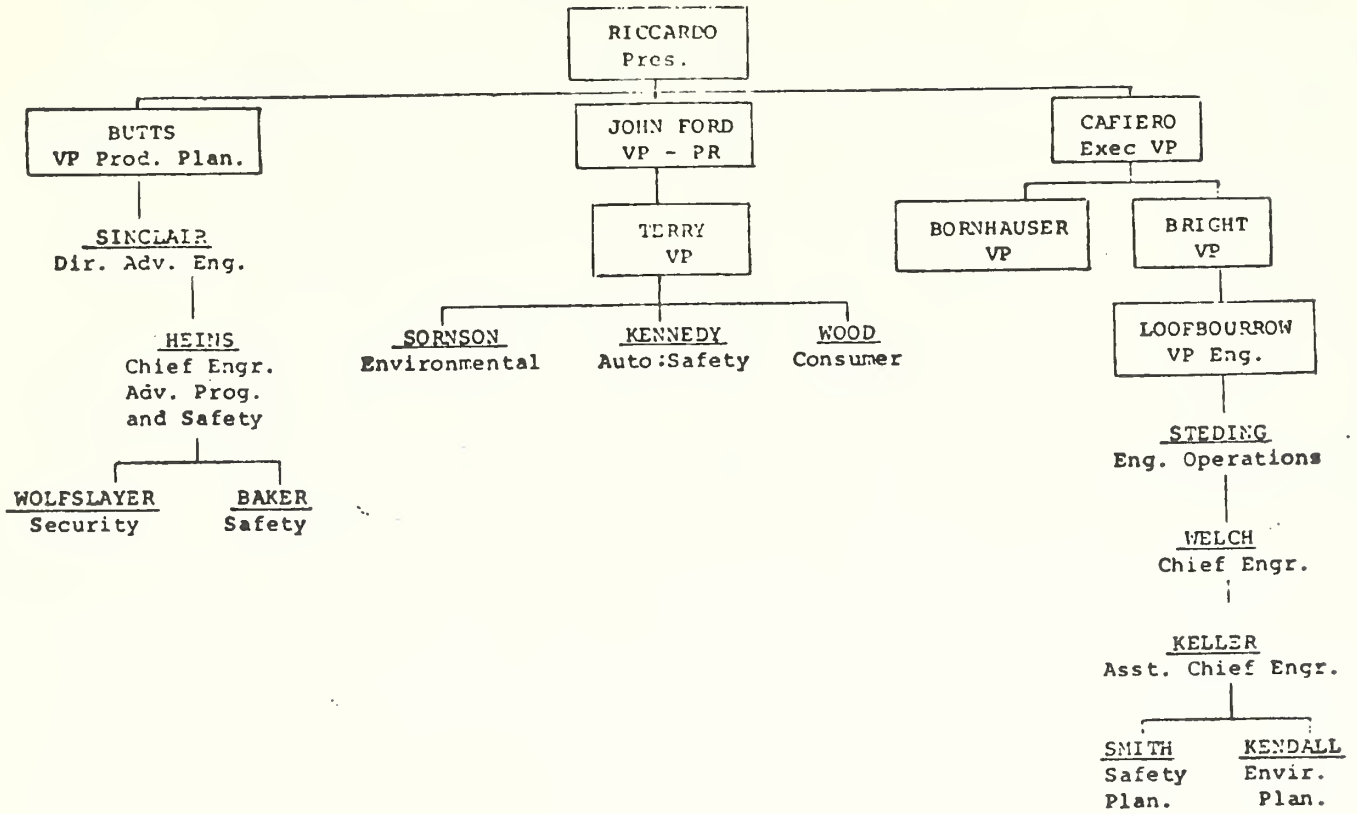

FIGURE 4-2 ORGANIZATION CHART, CHRYSLER CORPORATION CORPORATE SAFETY

planning supervises activities relative to long-term safety R&D. Finally, Mr. Loofbourrow, vice-president engineering, is responsible for converting the regulations into acceptable vehicle designs.

It appears that company finance and marketing functions are relegated to advisory and staff roles in the decision processes for both companies. While the inputs of these two groups are carefully considered and are important, it appears these two groups do not control or dominate the company's decisions.[1]

4.3.2 Alternative Analysis

There is hesitancy within industry to discuss the action alternatives that were considered by a firm, relative to a proposed standard. This is especially true in the case of legal actions that were considered. However, it has been conceded by several knowledgeable executives that legal action was actively evaluated during the MVSS 215 discussions.[2] The proposed action was finally discarded, however, because each company individually decided that it could live with the standard.

The only time that legal action was used was at the time of the original 201 proposed rulemaking. The decision to proceed was based on the feeling that the proposed rule was impossible to comply with and still meet the needs of the automobiling public. When the decision was made to proceed, a special inter-company group was organized to coordinate the industry's campaign, and an all-out effort was initiated. The proceedings were acrimonious, but industry won its point, and the proposed rule was withdrawn. A new standard was developed, with industry having major inputs into its design. The current standard is considered by industry to be a good one.

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[1] Doty, Arch, Consultant, op. cit.

[2] Ibid.

A great deal of hard feelings was generated from the MVSS 201 lawsuit, and it convinced industry management even more that a lawsuit is absolutely the last resort, and should be resorted to only when it appears the standard is significantly injurious to the industry, and to the economy.[1]

[1]Doty, Arch, op.cit.

5. EFFECT OF VEHICLE SAFETY STANDARDS ON INDUSTRY

5.1 CHANGE IN COMPETITIVE POSITION

While there have been significant changes in competitive positions since the Motor Vehicle Safety Act was passed, it was not possible within the limited funding available for this study to detect any changes in market position that have resulted from the legislation.

It would appear that the safety regulations work to the benefit of the larger manufacturer who has more extensive facilities and capital to support costs associated with meeting the standard. Too, larger production runs would provide a greater base against which to amortize costs. However, the exchange of technical knowledge, the pooling of research funding, and the licensing of technical product developments (such as the GM-developed energy-absorbing steering column) has tended to negate the competitive advantage which the larger manufacturers might accrue.

The production scale economy issue is complicated by the extent of differential that must exist between two models before they are to be considered as separate production units. For the foreign manufacturer the key question is the extent of aberration the U.S. version causes in his production line. The MVSS 203 did not present a problem since the Europeans have essentially the same regulation (ECE Regulation 12). However, the MVSS 212 and MVSS 215 standards have no counterpart in the European and Japanese domestic markets; consequently the European and Japanese manufacturers will experience production discontinuities. The importance of maintaining scale economies in automobile production was pointed out in a recent Charles River Associates (CRA) study.

> ...Per unit cost penalties of producing below optimal scale are fairly steep, especially below 200,000 units. Optimal scale is higher for small cars than for large cars, and in addition, the percentage cost penalty for producing 300,000

or fewer units per year is much greater for small car, especially minicar, production than for large car production....[1]

In the same study CRA indicated that the manufacturing costs for a minicar increased 200-220 percent as a production run decreased from 400,000 to 50,000 units.

For VW the product segregation did not present serious problems because of the volume of their U.S. sales. For those, however, who have modest penetration (such as British Leyland or Peugot), the standards have tended to increase their costs/unit much more than for U.S. manufacturers. As a final comment, it should be remembered that the majority of passenger cars imported from Europe are produced by subsidiaries as affiliates of U.S. vehicle manufacturers. Thus, the viewpoint and policies of the U.S.-based manufacturers regarding federal vehicle safety standards takes into consideration the requirements of their overseas affiliates.

5.2 EFFECTS ON COMPANY PROFITABILITY

There has been no hard data developed indicating the effects that the vehicle safety standards have had on company profitability. It appears, however, the safety standards do have a short-term effect on profitability, but that in the longer term, vehicle prices are adjusted to reflect safety improvements.

It would also appear that the smaller manufacturer is not able to pass on the costs of meeting safety standards to the same extent as the larger manufacturer, if he desires to remain competitive. In the years since 1966, General Motors has continued to show a higher

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[1] Charles Rivers Associates, Impact of Trade Policies in the U.S. Automotive Market, Prepared for the U.S. Department of Labor. CRA Report no. 219, October 1976.

rate of return on stockholder's equity, and the differential is increasing in favor of GM.[1]

While it is risky to assume that GM's improving performance relative to percent return on equity is solely the result of advantages gained through government regulation, the trend is consistent with the hypothesis.

5.3 CHANGES IN PLANT UTILIZATION

Investigation of the docket literature and interviews with industry representatives indicated that the three safety standards have had little impact on plant utilization. There is nothing that would indicate that the three study standards are untypical.

5.4 CHANGES IN ORGANIZATIONAL AND SOCIETAL RELATIONSHIPS

One of the immediate effects of the Vehicle Safety Act was the development of closer working relationships between the vehicle manufacturers and those directly involved in vehicle safety.

The automobile industry's coordinated safety standards activity is closely related to its safety research funding which is continued on a multi-million dollar per year basis. It is also closely allied with the activity of the vehicle manufacturers, both individually and jointly. In more recent years there has been increasing cooperation between industry's and NHTSA's safety research activities. To date the majority of the jointly funded research has been in the area of accident investigations, accident causation research and specific projects relating generally or specifically to results being achieved by existing Federal Motor Vehicle Safety Standards. An extension of

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[1] A regression analysis for the years 1970-75 for the rate of return on stockholder's equity shows a slope of -.363 for GM, and a -.777 for the entire industry.

this type of jointly funded research into benefit/cost analysis of existing or possible future motor vehicle safety standards certainly can assist in optimizing social benefits of standards through the introduction of new requirements or revisions of existing ones.

6. ANALYSIS OF GOVERNMENT'S ROLE IN VEHICLE SAFETY STANDARD DEVELOPMENT

The stated purpose of the National Traffic and Motor Vehicle Safety Act of 1966 is "to reduce traffic accidents and death and injuries to persons resulting from traffic accidents." The Act also is concerned with "the performance of motor vehicles and motor vehicle equipment in such a manner that the public is protected against unreasonable risk of death or injury to persons in the event accidents do occur, and includes non operational safety of such vehicles." The Act addresses both pre-crash and crash situations but is concerned only with human loss; no reference is made to economic loss. The agency established to be responsible for the activity was the National Traffic Safety Agency; later called the National Highway Safety Bureau; finally it was named the National Highway Traffic Safety Administration.

NHTSA, and its predecessor agencies, were to use safety standards as the means of dealing with motor vehicle safety; the standards were to be performance standards; and research and development was specifically called for to support the standards setting.

6.1 MANDATORY PERFORMANCE STANDARDS

The manufacturer is required to adopt changes in its product consistent with the terms of the standards. The consuming public can only buy the product as offered. The standard is intended to use the power of the law to enforce vehicle safety, thus overcoming the failure of traditional marketing mechanisms to induce the use of safety technology.

To date a total of 46 standards have been promulgated, with about one-half (22) implemented in the first 18 months after the law was put into effect. Only 20 have been promulgated since then (nine years).

The greatest emphasis has always been on the "pre-crash" standards, i.e., performance parameters are measured in a pre-crash environment, and are designated as 100-series standards. Twenty-three of these standards have been promulgated.

Crash environment standards (200 series) have also been promulgated in large numbers (17); these standards have also been the most controversial.

Only two post-crash standards (300 series) have been implemented. These standards have also created significant controversy.

The main objection to the standards has been the lack of precision in the specifications, resulting in the need to make interpretive assumptions. The suggestion was made that NHTSA should more thoroughly research the standard before proposing rulemaking.[1]

The other main objection has been the short time period allowed from rulemaking to official implementation. The criticism is raised so often, that one gets the impression that NHTSA is unaware of the importance of timing and scheduling in the manufacturer's design and production process.

A third objection is the government's apparent lack of objectivity in stating the performance specifications. Ford indicated this concern with the initial standards.

> ...In some cases they (the standards) either do not provide objective criteria in the first place or they call for test procedures not yet invented...[2]

This same theme continued to appear in the dockets of the three standards that were examined in depth.

Many of the docket submissions indicated the belief that there had not been the necessary research and development on the proposed standard performed prior to the notice of rulemaking.

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[1] Ford Motor Company General Comments on Proposed Initial Federal Motor Vehicle Safety Standards, Docket 3, No. 1

[2] Ibid.

6.2 ANALYSIS OF RESEARCH AND DEVELOPMENT

Analysis of the docket literature on the three standards indicated general agreement among the respondents that the proposed standards (or amendments) had not received sufficient research and development. The findings were generally consistent with the findings of an Arthur D. Little study investigating federally-funded R & D Programs:[1]

> ...The following comments are based largely on conversations with the representatives of various industrial, governmental and public interest agencies. No effort has been made to reproduce verbatim the comments offered by the respondents; the intent is to convey the sense of their comments.
>
> 1. The Federal Program is Not Establishing and Validating the Need for Vehicle Safety Standards. The NHTSA program concentrates heavily on hardware demonstration projects and design exercises and is deficient in the long-term, more fundamental studies which could explain the traffic safety problem and establish the need for particular regulations. Much of the controversy with industry is thought to stem from NHTSA's failure to undertake the longer term data acquisition and analysis effort which would establish that safety performance on the road would, in fact, be increased by compliance with safety standards that are proposed. The neglect of fundamental studies by NHTSA is attributed to the inability of such studies to provide the quick payoff required by near-term objectives established by short-term administrators.
>
> 2. The Program is Not Sufficiently Innovative. Opportunities for new technology are foregone in the interests of forcing the application of existing technology. This behavior is the result of a policy which seeks rapid correction of known deficiencies, even at the cost of superior results which could be obtained later. There is some question as to how much further improvement can be made in motor vehicle safety in the long run; emphasis is placed on the saving of a life today with known technology, rather that the possible saving of more life tomorrow with, as yet, undeveloped technology. The research emphasis discounts the value of future technology at a high rate.

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[1] Arthur D. Little, Inc., Federal Funding Civilian Research and Development, February 1976. PB 251266.

3. An Integrating and Coordinating Leadership is Needed in the Agency. The most serious criticism offered in the GAO report is the absence of an integrating and coordinating leadership at the top of the federal program. The Agency confronts so many opposing pressures and feels such a need to harmonize these that it must organize itself to more quickly apply the results of the research obtained. The deficiencies here may result from the number and quality of staff within the Agency, but clearly part of the problem results from inherent conflict between an R & D branch that struggles for objectivity and integrity and a rulemaking branch that is on the firing line trying to harmonize the diverse interests and points of view in motor vehicle safety. The field of automotive safety research is relatively young and immature. This is reflected in the Agency's early research efforts. Also, Agency scientists and engineers have lacked the training and knowledge to design and monitor an R & D program that was better directed toward the mission of the Agency.

4. The Research Program is Ineffective. Its effectiveness may be severely limited by the policy of rulemaking on performance standards. Design standards may, in fact, be needed to make the changes to motor vehicle safety which ought to be made. Cost/benefit justification of federal standards may, in the long run, prove to be nothing more than a stalling technique and a cover for indecision on the part of the Agency.

5. Federally-Funded Research and Development Program in Motor Vehicle Safety Must Begin to Consider a Broader Objective. In the past, the objective has simply been the reduction of losses in motor vehicle accidents; today, broader measures of cost and broader measures of benefits must be considered. Specifically, an effort must be made to balance concerns for safety with concerns for the economy. More specifically, proposed changes in the vehicle must be evaluated for their environmental effects and for their economic consequences, both for the purchaser of the motor vehicle and its producer. Federal responsibility is divided; the several agencies having concerns for the automobile must be coordinated if mutually counterproductive moves are to be avoided. Longer-range goals must be considered.

6. The Research Program Has Accomplished Much of Its Original Objective of Putting Established Safety Concepts to Use. Human loss is of primary concern and ways of reducing that loss have long been known. The federal effort, supported by its R & D program, had reduced these losses by the (forced) application of the safety concepts.

The above quotation accurately summarizes the feeling of industry observers concerning NHTSA's research and development efforts toward vehicle safety. The problems would suggest the following needs:

- Develop a coordinated program of research and development that recognizes the needs of the rulemaking branch of the agency and the timing needs of industry.
- Evaluate and implement the research findings in terms of rulemaking requirements.

7. CONCLUSIONS OF THE STUDY AND RECOMMENDATIONS FOR FURTHER RESEARCH

7.1 CONCLUSIONS

During the 10 years that there have been motor vehicle safety standards, there have been a wide variety of societal and economic conditions in which standards were promulgated. In the mid-sixties, at the time of the initial legislation, the automobile industry was under heavy attack from the public, and others, relative to the safety characteristics of vehicle designs. In this environment the industry found it inappropriate to assume any aggressive uncooperative position. They were, in fact, most cooperative with the government, shared internal classified information with government's representatives; and kept their criticisms of proposed rulemaking at minimum levels.

By 1975, however, the situation had changed. Fuel economy had become important; the public had become aware of the effects on the economy of an ailing automotive industry; a 55-mph speed limit had been implemented, significantly reducing the death and injury statistics. In that environment the industry has tended to be more emphatic in its criticisms toward proposed rules.

The above examples illustrate one conclusion of the study: that societal attitudes and economic conditions are a most important factor in the industry's responses to proposed rulemaking.

A second conclusion is that the industry continues to feel that government does not understand the time relationships between automobile design and the industry's pre-production planning cycle. In the three study standards, a major industry concern was the problems and increased costs that would result from not allowing sufficient time to permit incorporation of the necessary design changes into the normal production process.

There is industry concern over the lack of precision in defining standard requirements and test procedures; it is believed this is the result of insufficient research and development prior to rulemaking.

Generally, industry is favorably inclined toward the existing standards, with only two (out of 48) being considered as totally unnecessary.

It was not possible to detect the impact of the safety standards on a company's marketing posture, long-term profitability, or plant utilization.

Governmental R & D has had impact on manufacturer technology implementation. MVSS 212 is an excellent example of this fact.

The key decision and leverage point toward acceptance of any safety standard is clearly at the highest levels of a company's management. Among the functional activities it appears that engineering has the strongest position. Most of the technical coordination activities are assigned to the engineering staff in all of the big four producers. The other functions, i.e., marketing and finance, are always asked for supportive input for any standard; however, their role in the decision process is believed to be subordinate.

It is extremely difficult to develop any definitive data on alternate strategies that were considered by management relative to any standard. The inference is that on most standards there was only one strategy considered: attempt to obtain a standard that is well defined, and which will not seriously impact production, marketing, finance, etc.

7.2 RECOMMENDATIONS FOR FUTURE INVESTIGATIVE ACTIVITIES

The study identified five areas where further investigation is needed to provide guidance in policy formulation relative to technology implementation for vehicle safety standards.

7.2.1 Determine Necessary Lead Time Requirements

First there is a need to more precisely understand the lead time requirements for safety standard implementation. As has been

previously pointed out in this study, the major recorded complaint of manufacturers relative to proposed rulemaking was the need for more time before promulgation. In 1968 a study[1] conducted for the Federal government examined the area of automotive product introduction. The study was specific and detailed. But even today industry's complaints concerning the shortness of implementation lead time persist. There is a need to determine why there are still criticisms from the manufacturers, and to implement remedial action.

The proposed investigation would examine the dockets for a representative cross-section of standards and perform a follow-up investigation of any lead time complaints that were noted. From information obtained, lead time guidelines would be developed to aid governmental policymakers in their deliberations concerning effective dates of standard promulgation.

7.2.2 Investigate Current Benefit/Cost Relationships

It is now possible to examine the benefit/cost relationships of most safety standards since they have been in effect for several years, and an accident data base is being developed. Almost all standards were promulgated on the basis of pro-forma benefit/cost analyses. Now that vehicles that comply with the safety regulations have been in use for several years, it may be possible to update the benefit/cost analyses using actual data.

Industry representatives have often claimed, in public and in private, that the problem with the regulatory process is that there is not a continuing process of evaluation of the imposed regulations. As a result, there is a tendency among the regulated to strongly react to any suggestion of rulemaking; they see such rulemaking as the beginning of a non-reversible process. Development of a process for continually reviewing the benefits and costs of

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[1] Arthur Young & Company, "Automotive Industrial Engineering Study," National Highway Safety Bureau, Contract FH-11-6591, January 1968, PB 178326.

a standard would do much to encourage cooperation and fast and effective implementation.

It is suggested that as an initial effort in this regard the following standards be evaluated.

- 112 Headlamp concealment
- 117 Retread tires
- 124 Acceleration control
- 211 Nuts and discs
- 214 Side door strength
- 215 Exterior protection
- 216 Door crush resistance
- 312 Flammability

All of the above regulations are considered to be of "questionable value."[1]

7.2.3 Relationship Between Company Size and the Cost of Implementing a Standard

It was impossible during the available time and funding authorization for this study to make a reasonable assessment of the relationship between company size and the cost of implementing a standard. There is reason to suspect that there may, in fact, be a per unit cost differential associated with safety regulation compliance. If so, then an argument could be made that safety regulation, per se, is a restraint to competition, in that it tends to make the small producers even less competitive.

It is recommended that an in-depth investigation be undertaken to determine the extent, if any, that manufacturer's size affects safety regulation compliance cost. The study would cover all costs, from vehicle design through the normal in-use life of the vehicle.

The collection and validation of appropriate cost data will be difficult. However, it is believed that sufficient information may be obtained from analysis of existing standards to assess the merit of the premise.

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[1] c.f. post, Tables 2-1, -2, -3.

7.2.4 Coordination of Research Between Government and Industry

One of the major problems associated with effective standards development and implementation has been vagueness in specifications, test procedures, and benefits. Much of this problem could be eliminated, it is believed, if there were more effective pre-implementation research and development. One way to increase the effectiveness of the research effort would be joint industry-government research efforts. This joint effort would need to be supported by a long-range research plan, incorporating the needs and objectives of both participant groups. A non-biased third party could most effectively develop this plan and coordinate the research effort itself.

7.2.5 Develop a Long-Term Implementation Plan

The Motor Vehicle Goals Study was an initial beginning in evaluating and recommending long-range goals for composition of the automobile fleet. The study examined different potential scenarios under varying assumptions of safety standards, emissions regulations, and fuel economy specifications. It is recommended that there be an assessment of the problems and issues raised in the study, and that a plan be developed that would optimize the feasible levels of regulatory standards to best meet the total needs of the nation.

Because of the complexity and public nature of the task it is recommended that the program be conducted by an inter-agency task force, similar in staffing to that used on the Motor Vehicle Goals Study. It is recommended, though, that a sub-part of one of the agency groups should be an independent contractor whose assignment would be to evaluate different report recommendations as to their impact on efforts by the automobile industry to implement technology and changes.

APPENDIX A

FORD MOTOR COMPANY GENERAL COMMENTS ON PROPOSED INITIAL FEDERAL MOTOR VEHICLE SAFETY STANDARDS

DOCKET NO. 3; NOTICE NO. 1

FORD MOTOR COMPANY GENERAL COMMENTS
on
PROPOSED INITIAL FEDERAL MOTOR VEHICLE SAFETY STANDARDS

Introduction

Since their publication on December 3, 1966, Ford Motor Company has given as careful consideration to each of the proposed 23 initial safety standards, and the definitions, as the extremely limited time has permitted. The result of this consideration is that Ford is generally in accord with what appears to be the basic objective of each of the proposed standards.

The consideration that has been required to be given the proposed standards has been a tremendous undertaking. Each of the several provisions of the standards has had to be studied as it would affect some 96 models of passenger cars, in all their combinations of equipment, many basic lines of trucks, and a variety of special purpose vehicles. This has involved detailed technical evaluation of all of these products, including in some cases destructive testing. Our general and specific comments represent the best judgment that Ford can offer at this juncture without the benefit of an opportunity to conduct all the necessary studies and marshal all of the relevant evidence. Additional time would have made possible more complete and more fully documented comments with respect to the proposed standards.

Ford has, however, come to the firm conclusion that none of the Company's vehicle lines for 1968 would meet a number of the proposed standards as written, nor could Ford's 1968 model products be changed to meet all of the standards before the proposed effective date. In addition, many of the proposed standards should be revised and amended for a number of other reasons that are enumerated in these general comments and our specific comments dealing with the individual standards.

In submitting its comments Ford's purpose has been to raise and discuss only points of substance. But the possibility of being wrong in the interpretation of a given standard, or in judging whether a product will meet the standard, could be followed by such grave consequences (fines, recalls, injunctions) that every point that could be troublesome deserves to be raised, aired and settled before any standard is established by the Secretary.

This is important not only to the manufacturers but to the Secretary and to the public. Obviously, the shutting down of a vehicle line could bankrupt a small manufacturer and its dealers. It could cripple a larger manufacturer and injure its employees, stockholders, suppliers and dealers. It could hurt the economy of the nation. The consequences of any such disaster are too grave to permit the neglect or oversight of any significant problem presented by any proposed standard.

It is the purpose of these comments to raise in good faith and discuss as thoroughly as time has permitted all points, aspects, problems and considerations discerned up to this date, and to offer recommendations and suggestions believed to be in the best interest of all concerned and essential if the standards are to be reasonable, practicable, and appropriate.

Form of Comments

In the course of preparing Ford's comments on the proposed initial standards, it became evident that a number of considerations apply in the same general manner to a number of the standards. Also, some considerations apply to all of the proposed standards and to the standard-setting process. Accordingly, we have prefaced our specific comments on the individual proposed standards with some general comments in an effort to avoid repetition.

Thus, for example, the reasons underlying Ford's concern over the failure of a number of the proposed initial standards to meet the statutory tests of reasonableness, practicability, appropriateness, etc., are spelled out in these general comments.

The Statute

General Considerations

As Congress declared, the purpose of the "National Traffic and Motor Vehicle Safety Act of 1966" is to reduce traffic accidents and deaths and injuries to persons resulting from them through, among other things, the establishment of motor vehicle safety standards for vehicles and equipment (Sec. 1).

The motor vehicle safety standards provided for in the Act are intended to promote "motor vehicle safety," which is defined to mean "the performance of motor vehicles

or motor vehicle equipment in such a manner that the public is protected against unreasonable risk of accidents 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 that accidents do occur, and includes nonoperational safety of such vehicles" (Sec. 102(1)).

In the course of enacting the statute, Congress recognized that broad powers would be conferred upon the Secretary and that commensurate, grave responsibilities would be imposed upon him. These responsibilities include not only the promotion and advancement of traffic safety in the public interest, but the attendant obligation to avoid serious adverse effects upon the automotive industry and, hence, upon all of those whose livelihoods are dependent upon or are affected by it.

As stated in the Senate Committee Report (Rep. No. 1301; Cal. No. 1272), p. 4:

> "The committee also recognizes that the broad powers conferred upon the Secretary, while essential to achieve improved traffic safety, could be abused in such a manner as to have serious adverse effects on the automotive manufacturing industry. The committee is not empowering the Secretary to take over the design and manufacturing functions of private industry. The committee expects that the Secretary will act responsibly and in such a way as to achieve a substantial improvement in the safety characteristics of vehicles."

Congressman Harvey of Michigan was particularly concerned with the possible impact of the standards on the auto industry. He spoke in the following tenor in the House on August 17, 1966, during the course of final consideration of the legislation (Con. Rec. -- House, p. 18787):

> "Mr. Chairman, I might say that I come from primarily an automobile district in the State of Michigan. I have a substantial number of union workers in my district who belong to the UAW-CIO and who make their living in the production of automobiles and in the production of automotive parts.

"Mr. Chairman, many of these workers have written to me, as have the automobile executives themselves. I believe some of this concern from those in the auto industry comes about because of the very vast discretion that is turned over to the Secretary in this particular bill.

"Mr. Chairman, this is something that I cannot think of any way to get around. We must empower him with the authority to get out these particular standards. Whether the Secretary truly understands when we talk of the model year -- whether he truly understands when we talk of the leadtime necessary in new model production and comprehends these things are tremendously important, not only to the automobile industry but to all of our country. What the Secretary does and what he says in these regulations will affect directly the lives and the earnings of one out of every seven Americans in the 50 States of America.

"In my district, I am sure that not only one out of seven but the majority of the people are either directly or indirectly dependent upon the auto industry. So it is very vital to them.

"But, Mr. Chairman, I want to say to the chairman that this House in supporting this legislation has to be mindful of the fact that no matter whom we have in the position of Secretary, I believe we must assume that this person is going to act reasonably and that he is going to act wisely.

"Mr. Chairman, having these things in mind and in view of these considerations, I expect to support the legislation."

The Secretary, therefore, is charged with extremely important duties to protect the public and at the same time with grave responsibilities to the automotive industry and all of the millions of people whose livelihoods are tied to it. Hence the Secretary has a most difficult job to do. He must accommodate many complex but vital interests of many segments of our population. In the process, he must apply, and his actions must accord with, statutory criteria.

Essential to a proper interpretation and application of the statutory criteria are a recognition of the leadtime and model cycle necessities of the industry. Failure to take these into account would disrupt the industry, contrary to the intent of Congress.

Standard making, so far as leadtime and model cycles are concerned, would be a relatively simple matter if it applied only to one company, making one line of vehicles, ordinarily redesigned and retooled every 3 or 5 years. But this is not the case with the automotive industry, nor is it the case with Ford Motor Company. Ford has nine basic lines of passenger cars (Lincoln, Mercury, Comet, Cougar, Thunderbird, Ford, Fairlane, Falcon and Mustang, coming in 96 models in all) and numerous lines of trucks, from the light pickup trucks through medium, heavy and extra heavy vehicles.

These lines of vehicles are not on the same model cycles, and it would be extremely uneconomic and probably impossible to place them on identical cycles. There simply would not be enough engineering capability and tooling capacity available to Ford Motor Company to permit this to be done, quite apart from the staggering costs that would be involved. Accordingly, some of Ford's cars are and will have to remain on about a 4-year cycle for basic model changes if they are to be sold at a cost the consumer is willing to pay for that type of vehicle. And the basic model changes for all types of vehicles must be staggered so that they do not all come in the same year.

In the interest of promoting a better understanding of the involved subject of leadtime, we have prepared and attached as Appendix A a detailed statement describing the timing provisions under which Ford Motor Company develops its products. Certain information is disclosed in this Appendix that Ford would have preferred not to have to reveal to competitors. The decision to incorporate the Appendix is predicated on the assumption that a better understanding by the National Traffic Safety Agency of industry practices would compensate for any disadvantages following from the disclosure of proprietary information.

Public comments by some members of the industry after the publication of the proposed standards have led many observers to conclude that the automotive industry is recalcitrant, or against safety, or poorly managed if it cannot incorporate the safety requirements called for under

the standards. This is not so. The most serious problem in most cases is that the manufacturers cannot incorporate changes to conform with many of the standards in the time permitted.

It is generally viewed that the manufacturers have seven months between the planned publication date of the initial standards and their proposed effective date in which to incorporate these changes. As shown in Appendix A, however, seven months is an inadequate period of time to contain any but the most modest physical revisions to the product.

Mass production of automotive vehicles cannot be accomplished by having untested and uninspected parts arrive at an assembly plant on the day vehicle production is scheduled to start. Reliability and quality control objectives can be met only by obtaining preproduction parts produced from production tooling substantially in advance of the scheduled start of vehicle production. Ford's production "sample required dates" for the 1968 model year, generally range between April 10 and May 8, 1967. Because thousands of suppliers, as well as scores of Ford plants are involved in producing componentry, it is normal that a great number of minor engineering changes are initiated in the 90 days or so preceding the start of vehicle production. Preproduction vehicle build -- the construction of what Ford calls pilot models -- takes place during this period as a functional prove-out, and it is important in this period that all parts be produced from production tooling.

The purpose of this discussion is to explain that the seven-month period between January 31 and September 1, 1967, is a grace period of perhaps three or four months -- not seven, with respect to the Job 1 production date for new vehicles. In addition, what is not generally understood is that Job 1 for sheet metal or a new axle might precede the vehicle Job 1 by one to two months in order to fill the production pipelines.*

* The Secretary is required by the Act to issue new and revised safety standards on or before January 31, 1968. It is logical to assume that the Traffic Safety Agency will wish such standards to be reflected in 1969 model production. In view of the timing problem cited above, we recommend that the Secretary consider advancing the issuance of notice of new and revised standards from January 31, 1968, to approximately August 31, 1967. (continued on page 7)

One tragic consequence of an administration of the Act that fails to honor established industry practices with regard to leadtime is the "defensive engineering" posture the manufacturers would be forced to assume in an attempt to ensure their ability to continue their business operations without chaotic dislocation. If last minute changes in vehicles are required to meet safety regulations, the accelerated engineering and procurement of tooling at premium costs would not only be inordinately expensive but the new regulations would force inefficient designs that would unnecessarily increase the cost and weight of finished vehicles. If time is lacking for the redesign and retooling of a component or a structure, an engineer has no choice but to recommend the incorporation of added parts and pieces -- a wasteful, wholly unsatisfactory process.

Ford Motor Company has marshalled its technical forces in an attempt to comply with the proposed standards. Many engineers and research men, whose assigned task it is to conduct advanced engineering investigations that can lead to better and safer cars for 1970 and later model years, have been withdrawn from such assignments in order that they may assist in solving "today's" problems. This dilution and deferral of advanced engineering efforts is of serious concern to Ford management. To others interested in longer-term advancements in the design of safer vehicles, it should be of equal concern.

If this is done, the industry will be aware of the revised standards approximately 12 months before the start of 1969 production. Although a 12-month period is inadequate for most substantive changes, it should improve the ability of the producers to incorporate less substantive changes. A shift to an August 31 date would be of immense help to the industry, but, of course, it would not remove the leadtime problem. Ford further wishes to suggest for consideration that the Agency make every possible effort to indicate or publish -- as far in advance of each August 31 as possible -- its general intention with regard to the areas of the vehicle it might subject to new safety standards on August 31. The sooner such "early-warning" can be given, the more constructive can be the industry's response. The greater the time available, the lower should be the cost of the revised designs and features, and the greater might be their effectiveness.

Leadtime and model change considerations are inextricably linked not only to engineering and production practicability, but to cost and economic considerations. That these latter considerations must be given appropriate weight is made clear in the legislative history of the Act. The Senate Report contained the following on the subject (p. 6):

> "The General Counsel of the Commerce Department stated in a letter to the committee:
>
> > The tests of reasonableness of cost, feasibility and adequate leadtime should be included among those factors which the Secretary could consider in making his total judgment.
>
> "The committee intends that safety shall be the overriding consideration in the issuance of standards under this bill. The committee recognizes, as the Commerce Department letter indicates, that the Secretary will necessarily consider reasonableness of cost, feasibility and adequate leadtime."

The House Report echoed these sentiments, saying (Report No. 1776, p. 16):

> "In establishing standards the Secretary must conform to the requirement that the standard be practicable. This would require consideration of all relevant factors, including technological ability to achieve the goal of a particular standard as well as consideration of economic factors."

Of particular pertinence here is the colloquy in the House of Representatives between Congressmen Dingell and Staggers (the latter, Chairman of the House Committee that voted out the bill) on August 17, 1966 (pp. 18793-4). It deserves reading in its entirety. For convenience, it is attached hereto as Appendix B. As will be seen, all of Mr. Dingell's remarks were concurred in by Congressman Staggers.

Initial Standards

It is the scheme of the statute that there be issued "initial" standards "based upon existing safety standards" on or before January 31, 1967, and then that new and revised standards be issued on or before January 31, 1968.

In the bill passed by the Senate, these "initial" standards were termed "interim" standards, but the statutory purpose and philosophy underlying the important distinction between them and the later revised standards were the same as in the statute finally enacted. The Senate Report explained (pp. 5-6):

> ". . . In order that the congressional mandate be made unequivocal and certain and that safety standards be established at the earliest practicable time, the bill directs the Secretary of Commerce to prescribe interim motor vehicle safety standards by January 31, 1967 (Sec. 102). These standards are to be effective within 6 months to 1 year thereafter. Such interim standards, which will be promulgated before the Secretary is able to derive substantial benefit from the new research and development activities also authorized by the act, will necessarily be based upon existing public and private standards, evaluated in the light of available technical information.
>
> "Thus it is anticipated that in selecting interim standards, the Secretary will consider and evaluate the current GSA safety standards for Government-purchased vehicles (a copy of the current standard is included in the appendix to this report). The Secretary will also be expected to review existing State motor vehicle standards as well as voluntary SAE standards to determine which may appropriately be used as a basis for interim national standards."

Congress thus recognized that, in view of the shortness of time and the absence of the new data to be developed by the Secretary in the future, he would issue initial standards based upon existing standards. Obviously, these initial standards, by and large, were to incorporate existing practices and design intent. They were not significantly to go beyond or exceed current practices and engineering design objectives, else many vehicle lines would not meet the standards or could be made to do so only through uneconomic and disruptive "crash" programs.

An example, in Ford's view, of an agregious depai ture from the statutory scheme is presented by proposed standard 207 relating to seat anchorages. This standard would require a very large increase in seat anchorage load resistance over existing design levels. It is one which Ford's 1968 vehicles would not meet;

it is one which could not be met through design and production changes in the time contemplated by the Act; and it is one which, for the reasons stated in the specific comment, should not be established in any event because the standard could not be expected to enhance occupant safety.

This is an unusually apt illustration of the consequences that inevitably will flow from departure from the statutory scheme -- from an effort in the initial standards to promote an upgrading of design objectives without adequate technical foundation, and without due regard for the leadtime involved or comprehension of the excessive costs and disruption that would be entailed in an effort to meet the new standards. In these instances, it cannot be said that the initial standards are in fact "based upon existing standards." If promulgated, they would be unlawful.

In this connection, it should be noted that Congress did not direct that the initial standards be all inclusive. The concept of the statute is clear -- the Secretary is to include in his initial standards only those that are based upon existing standards and are feasible and practicable in the context of the existing situation and the short time available.

Following establishment of the initial standards, the Secretary is directed by the statute to issue "new and revised" standards on or before January 31, 1968. Congress contemplated that, by this time, the Secretary will have had the benefit of the significant research, study and testing authorized by the Act as a foundation for the new and revised standards (see Senate Report, supra). Presumably, in these new standards the Secretary will commence a process of studied improvements in their safety benefits as the need therefor may appear and as new technology becomes available.*

* At the risk of seeming premature, Ford is constrained to point out that now (January, 1967) many of Ford's 1969 models, due to be introduced in the fall of 1968, are so far along in development that they cannot be changed in many basic respects short of a major tear-up that would involve unprecedented economic hardships and risk the deferral of the planned production start for some of the vehicle lines. Thus, even Ford's 1969 models will not, and cannot now be made to, conform to some of the presently proposed "initial" standards. And should the new and revised standards to be issued on or before January 31, 1968 again call for substantial design changes on those vehicles, they will not be able to be produced.

Statutory Criteria

Each Standard Must Be Clear and Precise

One of the most pervasive and distressing aspects of the standards is the need to make one or more (in the case of standard 101, six) "interpretive assumptions" with respect to the standard before Ford can even consider whether its products will meet the standard or could be altered to meet it. This state of affairs would be intolerable in standards as finally issued. Presumably, when the initial standards ultimately are issued there will be no occasion for any manufacturer to make his own interpretive assumption at his peril.

It is an established principle that any regulation having the force of law must be clear, precise, unambiguous and fairly susceptible of only one interpretation, if a penalty is to be invoked for its violation. Thus, it is not enough to say that, with respect to a given safety performance standard, only reasonable men will administer it and they can be trusted to interpret and apply it in a reasonable way. There are enough unreasonable persons among the "interested persons" in this country, and elsewhere, to make life miserable for both the manufacturers and the administrators if there is any ground for dispute as to the meaning of any standard. In addition, room for interpretation in a standard automatically provides room for discriminatory application -- another aspect unwelcome to manufacturer and administrator alike.

The manufacturers simply must be able to make sure of where they stand under a standard before they begin to make and sell their vehicles. They do not want to litigate with anyone, nor do they want fines or injuctions. Presumably, neither does the Secretary. The way to avoid the problem is to exorcise, so far as humanly possible, any and all vagueness and ambiguity: Make the standards clear, precise and complete, so that there can be no argument whatever on what a standard means, to what it applies and what are its measurable dimensions. It will be problem enough to determine with certainty whether particular products actually meet the standards issued, even if they are pristine in their clarity.

With respect to each instance in which Ford has made and set forth "interpretative assumptions" in its comments on individual proposed initial standards, Ford requests that the Secretary or his delegate confirm or deny the correctness of each such "interpretative assumption" in the event that the standard is finally issued as presently drafted or is issued in language requiring that a similar "interpretative assumption" be made as to it. Should any interpretation be denied, then Ford objects to the proposed standard on this additional ground.

Each Standard Must Cover Only an Unreasonable Risk

The statutory definition of "motor vehicle safety" enjoins that the public be protected against "unreasonable risk" of accidents or death or injury to persons. Any standard that is established must have a significant bearing on safety.

An illustration of the kind of thing the Congress did not intend to be covered is found in portions of the proposed standard 107 relating to internal reflecting surfaces. A requirement that the left door handle (if that requirement indeed is imposed by the proposed standard as drafted, which is not clear on the point) have a non-reflective surface presumably so as not to catch the eye of the driver, simply does not serve to avoid any unreasonable risk of accident or injury to anyone where it can be shown that only under the most infrequent circumstances will any glare from the door handle be visible to the driver. It therefore should not be covered by a standard. Particularly, it should not be covered by a standard which might adversely affect other aspects of the door handle, such as durability and attractiveness, quite apart from imposing another cost penalty on the car.

This was clearly outlined in the Senate Report, cited above, page 6:

> ". . . The Secretary is not expected to issue a standard covering every component and function of a motor vehicle, but only for those vehicle characteristics that have a significant bearing on safety."

Like considerations also strongly suggest the propriety of recognizing that the public would prefer that some features be available as optional, not mandatory, equipment and establishing standards for them on that basis. For example, if there is reason to believe that many people do not want the features, will not use them or will take them off of their cars, why make all customers pay for them? Attention on this score is invited to Ford's comments on proposed standards No. 202 and No. 208 relating to head restraints and shoulder harnesses.

Each Standard Must Be Practicable

One of the most important statutory criteria for the standards to be issued is that they be "practicable" (Secs. 102(2)); 103(a)). The dictionary does not help very much here, but common parlance and usage suggest that the term does have useful content as applied to the automobile

industry. Manifestly, practicable does not mean "possible," or even "feasible," because it would be possible and technologically feasible to do many things to vehicles; but it would not be "practicable" to do them in view of considerations of leadtime, cost and the basic design objective of the vehicles.

In short, special, costly crash programs should not be required to be undertaken to meet a proposed standard without a compelling showing in favor of the standard and the effective date that would require the programs. Otherwise, the standard would not meet the statutory test of practicability.

As Congressman Dingell observed in the course of his colloquy with Congressman Staggers on the floor of the House (see Appendix B, p. 18793):

> ". . . Obviously, a standard is not practicable or reasonable if it cannot be met by the best efforts of manufacturers within the constraints of time and technology. As the committee's report states, 'Standards, of course, cannot be set in a vacuum,' and the Secretary, in setting standards, is required to give consideration to 'all relevant factors, including technological ability to achieve the goal of a particular standard as well as consideration of economic factors.' Among those economic factors which the Secretary will have to consider is the matter of adequate leadtime. . . ."

Observance of this statutory requirement of practicability will call for a very high order of wisdom and discretion on the part of the Secretary. Practicability is a concept difficult to define and apply in particular cases, but it must be applied if the standards are to meet the statutory test. Obviously, sincere, informed people can differ widely in their views as to whether a particular standard would satisfy this requirement. Nevertheless, it must be satisfied, or the standard will be unenforceable.

Each Standard Must Be a Performance Standard

The only Federal Motor Vehicle Safety Standards authorized by the Act are, by definition, those which set minimum performance requirements (Sec 102(2)). That this explicit requirement was intended to foreclose the

possibility of federal specification of designs or devices is shown in the Report of the House Committee (p. 16):

> "There is no reference anywhere in the definitions to the concept of 'design.' Rather, the definitions, and this bill have been written in terms of requiring standards of motor vehicle and equipment performance. The Secretary would not become directly involved in questions of design."

The point is emphasized at length in the Report of the Senate Committee (p. 6):

> "Unlike the General Services Administration's procurement standards, which are primarily design specifications, both the interim standards and the new and revised standards are expected to be performance standards, specifying the required minimum safe performance of vehicles but not the manner in which the manufacturer is to achieve the specified performance (sec. 101(b)). Manufacturers and parts suppliers will thus be free to compete in developing and selecting devices and structures that can meet or surpass the performance standard.
>
> "The Secretary would thus be concerned with the measurable performance of a braking system, but not its design details. Such standards will be analogous to a building code which specifies the minimum load-carrying characteristics of the structural members of a building wall, but leaves the builder free to choose his own materials and design. Such safe performance standards are thus not intended or likely to stifle innovation in automotive design."

The preservation of competitive stimulus to safety progress and the desire to avoid inhibition of design innovation through administrative fiat are not the only bases for the explcit requirement that the standards authorized by the Act deal only with motor vehicle performance. Doubtless, the Congress had fully in mind the economic disasters and windfalls that would come to certain manufacturers, suppliers, inventors and patent assignees, were particular devices or designs to be required in this year's standards and abandoned or foreclosed by next year's.

Indeed, the provision of Sec. 106(c) requiring that all information, uses, processes, patents and other developments resulting from federally-supported research activity be made freely and fully available to the general public clearly evidences a determination that no federal action authorized by the Act should establish a favored status for particular designs or devices in the name of motor vehicle safety.

An example of a proposed standard that Ford believes violates this aspect of the statutory injunction is standard No. 105 as it relates to parking brakes (specifying friction type, controlled solely by mechanical means).

Each Standard Must Meet a Need For Traffic Safety

Further examination of Ford's comments on the specific standards discloses that, in Ford's view at least, no showing has been or can be made for some of the proposed standards as being ones which meet "the need for motor vehicle safety." This is another of the tests for standards contained in the Act (Secs. 102(2); 103(a)). (See also Sec. 103(f)(4), wherein the Secretary is instructed to "consider the extent to which such standards will contribute to carrying out the purpose of this Act.")

For example, proposed standard No. 207 would impose a standard for seat anchorage strength far beyond any need for such strength. It would be unreasonable, in these circumstances, to require that the cost be incurred to attempt to meet it. Similarly, there is no relevant data to require the conclusion (and indeed Ford now has good reason to believe otherwise) that a three-inch relative displacement of the steering wheel in a 30 mile per hour barrier crash, as called for in standard No. 204, would better protect against unreasonable risk of death or injury in the event of an accident than would a five-inch displacement. Thus, this standard also fails to meet a demonstrable need for motor vehicle safety. Indeed, its adoption would impose design rigidity at odds with progress in traffic safety because it may well be (and promising experiments on this question are now underway at Ford) that a five-inch displacement is actually safer than three.

Another good example of a proposed standard that fails to meet the need for traffic safety is standard No. 111, governing rearview mirrors. It calls for an outside mirror that would enable the driver to see a rearward point one foot inboard of the vehicle at a ground level point 35

feet behind the driver. Ford's existing designs permit this vision objective to be achieved through a combination of the inside and outside mirrors, working together as a rearview "system." Since the objective is already achieved, there is no safety need which would justify the changes required to meet this proposed standard. But quite apart from that, in order to meet the standard, rearview mirrors on most Ford cars would have to be stuck out on the side of the car some 8 inches or more. If this were done, consider the hazard to the poor pedestrian or cyclist in the case of an otherwise near miss. And what is to be done about meeting state laws that now regulate the permissible width of passenger cars and might be violated by the protruding mirror?

Each Standard Must Be Objective

The statute and the legislative history are clear that any standard proposed must be stated in objective terms (Sec. 103(a)) and must provide objective criteria (Sec. 102(2)). These are vital requirements. Their observance in each standard as finally issued is of the utmost importance if the manufacturers are to know (a) that their products conform and (b) that they can prove it in the face of attack.

The converse of objectivity (capability of unequivocal discernment or measurement) is subjectivity (dependent upon the mind and predilection of the observer). The House Report bluntly warned (p. 16):

> "In order to insure that the question of whether there is compliance with the standard can be answered by objective measurement and without recourse to any subjective determination, every standard must be stated in objective terms."

Any standard not following this statutory test would be unlawful and unenforceable. In addition, any standard of dubious objectivity would compound the problems of both the manufacturers and the Secretary. It would not be easy to live with nagging doubt as to whether someone else agreed with one's own views, however strongly held, as to whether a car line met a standard not stated in objective terms and not providing objective criteria. And although an understanding administrator might be inclined to take a reasonable view on his part, would others let him do so?

For these reasons, Ford is deeply concerned over a number of the proposed initial standards. In some cases they either do not provide objective criteria in the first place or they call for test procedures not yet invented. These infirmities in the proposed standards must be cured, or the standards should be deferred until they can be put in clearly objective terms and provide objective criteria capable of unequivocal discernment, measurement and physical demonstration.

Parenthetically, the GSA did not have to worry about objectivity for there was no statutory duty that it do so. Such is not the case, however, with the Secretary, under the National Traffic and Motor Vehicle Safety Act of 1966.

Each Standard Must Be Reasonable

The statute commands that, in prescribing standards, the Secretary shall, among other things, consider whether the standard is reasonable, as well as practicable and appropriate for the particular type of vehicle or item of equipment for which it is prescribed. (Sec. 103(f)(3)).

The attribute of reasonableness is a basic legal requirement in every rule-making exercise under the Administrative Procedure Act. The regulation, rule, or in this case standard, must be reasonable -- that is to say, it must have a rational basis related to the purpose of the statute and not be "arbitrary" or "capricious." An example of an arbitrary standard would be one not founded on information or data pointing to its suitability, but established merely on the basis of fiat. A "capricious" standard would be one springing from whim or caprice and not resting on a rational foundation related to the objective sought by the statute.

Each Standard Must Be Appropriate

The statute and its legislative history are clear that the Secretary can (and indeed must) establish classes of vehicles, depending upon their type, and apply appropriate and possibly different standards to them. The statute requires that the Secretary "consider whether any ... standard is ... appropriate for the particular type of motor vehicle ... for which it is prescribed" (Sec. 103(f)(3)).

The House Report emphasized (p. 18):

> "The Secretary must also consider whether a proposed standard is reasonable, practicable, and appropriate for a particular type of vehicle or equipment for which it is prescribed. This provision allows the Secretary in prescribing standards to consider the reasonableness and appropriateness of a particular standard in its relationship to the many different types and models of vehicles which are manufactured."

The pertinence of the legislative concern for appropriateness of the standard to the particular type of vehicle involved is immediately apparent from a study of Ford's responses to the individual standards. Under the proposed standards as written, if the Econoline wagon and Bronco are regarded as passenger cars, then there are many of the proposed passenger car standards that these vehicles cannot meet and cannot practicably be made to meet in a reasonable time and at reasonable cost. Ford believes that these vehicles should be considered as being among a class of special purpose vehicles which merit standards directed specifically to them.

These special purpose vehicles, fundamentally, are "hybrids" in that their basic design is that of a truck, but some models are produced primarily for passenger-carrying purposes and are consequently registered as passenger cars in some states. Such vehicles are not "trucks," for they have been modified to offer passenger-carrying capabilities (such as seats installed in the load area of a van), nor are they "passenger cars," for many attributes normally attributable to a car are non-existent or have been compromised in a design trade-off to offer other features (such as 4-wheel drive, removable tops, high ground clearance, demountable windshields, etc.).

It is the flexibility and dual purpose function of these vehicles that creates the market for them. An owner may use a van, for example, as a delivery truck during the week and convert the unit to a passenger-carrying camper for weekend recreation by bolting in place the removable seats. Ford Motor Company considers that its Bronco and Econoline Club Wagon are truly "hybrid vehicles" and recommends, therefore, that they not be treated as "passenger cars" or "trucks" for the purpose of applying safety standards. This is not to suggest that Ford wishes to make vehicles that are less safe than they could be or that the Company is attempting to avoid the objectives or the specific provisions of the National Traffic and Motor Vehicle Safety Act of 1966.

The Bronco, as an example, is produced only with 4-wheel drive, and it is put to a great variety of uses, including off-the-highway applications. Ford has developed a passenger-carrying version of this vehicle that is popular in the recreational vehicle market. Some of the product features that make this vehicle attractive to sportsmen, for example, make it physically impossible to bring it into compliance with a number of the safety standards that are proposed for passenger cars.

If the Bronco is to be treated by the Traffic Safety Agency as a passenger car, then the only practical commercial decision that Ford can make is to withdraw it from production. Preliminary estimates are that it would be possible to conform to a number -- but by no means all -- of the proposed standards by the 1969 model year, if an all-out engineering redesign program were launched at this time. The planned life cycle of this vehicle, however, is much longer than that for passenger cars, and to re-engineer a new vehicle earlier than contemplated (say for 1969 or 1970) would require the abandonment of a substantial investment in the present vehicle that will not have been amortized. The current price of the vehicle is predicated upon the write-off of the high fixed investment over a number of years in the future.

The Econoline Club Wagon represents a similar case. This truck was engineered as a light weight van without compromises for passenger-carrying purposes. In the interest, however, of appealing to that market segment that finds a vehicle of the Econoline's shape, cubage and low price attractive for special purpose uses, a model with windows has been developed that is merchandised as an Econoline Club Wagon. This unit is also popular with automotive modifiers, who purchase the units and convert them into campers and special vehicles.

In addition to the two examples cited above, Ford offers a number of truck chassis and incomplete vehicles that are modified by others for special purposes. The ultimate products developed by such modifiers represent a wide variety of vehicles. Fire engines, rescue units, school buses, multi-stop delivery trucks, ambulances, limousines, airport maintenance vehicles, mobile homes and mobile libraries are typical products of modifiers and converters.

Ford Motor Company's sales volume of chassis for such vehicle applications is substantial, and the number of customers is measured in the thousands. It is clear that special purpose vehicles, including truck chassis, serve an important function in satisfying a diverse and important market segment.

Accordingly, Ford urges that, in the issuance of initial standards, the Secretary establish a fourth vehicle classification covering "special purpose vehicles." Ford's initial view is that, at a minimum, the standards applied to trucks could be applied to special purpose vehicles as well. In no circumstances is it reasonably practicable or appropriate for the industry to apply passenger car standards to such hybrid vehicles, developed from truck chassis, even though they are put to passenger-carrying uses from time to time by customers. If it is not seen fit to declare a fourth classification, it would appear appropriate to expand the truck classification to "trucks and other special purpose vehicles."

Other Comments On The Proposed Standards

Descriptive Phrases in the Standards

In its individual comments, Ford objects to what it believes are subjective and exaggerated phrases characterizing the purpose and scope of some of the proposed standards. Thus, for example, Ford objects to language in proposed standards No. 205 and No. 206 which describe the purpose of those standards as being to "prevent occupants from being thrown" through the windows or from the vehicle in the event of collision, when, in fact, the provisions of the standards will accomplish no such result.

In addition to the avoidance of possible misunderstanding as to the purpose or the effect of the Initial Federal Motor Vehicle Safety Standards, the Secretary should be mindful of the impact which inaccurate phraseology could have on the task of the courts in judging civil liability for product performance in private litigation. Even though the Secretary and the manufacturers know, for example, that there is no type of glass that could safely prevent the ejection of an unrestrained occupant from a vehicle involved in a severe accident, the description of the purpose of standard might well be taken, even though erroneously, by a person thrown through a windshield as proving that the car failed to conform to the federal standard.

Due Process of Law

Two general aspects of the current initial standard-making process have been particularly troublesome, and their presence raises serious questions of due process of law. The first is the shortness of the time that has been afforded for study, analysis and testing of the proposed standards as they would apply to all Ford products, and the preparation of these comments. The second is that the Notice of Proposed Rule

Making did not set forth the reasons for the proposed standards and contained and referred to no supporting data or evidence upon which they are based. In these circumstances, Ford feels that it must reserve the right to object to the initial standards when issued, if it is so advised, on the ground that procedural due process was not accorded in their promulgation and to submit additional comments and evidence before their issuance. Ford sincerely hopes that it shall never be required to exercise any such rights.

Comments of AMA

Ford joins in and subscribes to the Comments on the Initial Standards offered by the AMA on behalf of its member companies and adopts them as Ford's comments to the extent that they are not inconsistent with any of Ford's comments.

APPENDIX B

MOTOR VEHICLE SAFETY STANDARDS 203, 212, AND 215

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection from the Steering Control System

(Docket No. 74–33; Notice 2)

This notice amends Standard No. 203, *Impact protection from the steering control system*, 49 CFR § 571.203, to exclude from its requirements some passenger cars which meet the frontal barrier crash requirements of Standard No. 208, *Occupant crash protection*, 49 CFR § 571.208.

The NHTSA proposed this exclusion of vehicles from the requirements of Standard No. 203 at the request of General Motors, to permit development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements (S5.1) of Standard No. 208 (39 F.R. 34062, September 23, 1974). General Motors sought the exclusion because its modification to the steering control system to incorporate the air cushion system and accept higher loads exerted during a crash makes conformity of the column with Standard No. 203 difficult and sometimes impossible.

Comments were received from General Motors Corporation and Volvo of America Corporation, in support of the proposal. Renault, Inc., Peugeot, Inc., and Mercedes-Benz of North America, Inc., supported the proposal and suggested that the exception be extended to passive straint systems that incorporate seat belts. These comments argue that the use of passive belts will be high and that the protection offered by Standard No. 203 would in nearly all cases be redundant to that of Standard No. 208.

As a general matter, the NHTSA has maintained that the redundant occupant crash protection offered by standards (e.g., Standard No. 212, *Windshield retention*) is justified for those situations where the primary occupant crash protection system fails, or multiple collisions occur. Redundant protection is particularly justified in the case of passive seat belts because of the greater likelihood that seat belt protection will be rendered inoperative by an occupant than will crash-deployed protection.

In this case, the NHTSA has made the limited determination that the redundant protection offered by Standard No. 203 is not justified where it directly interferes with development of a more advanced, convenient, and effective restraint system. In contrast, it is obvious that passive systems which utilize belt assemblies do not require modifications of steering control systems and there is, therefore, no reason to sacrifice the redundant protection. These petitions to expand the scope of the proposed exception are accordingly denied.

American Motors Corporation has suggested that an exception not be granted in this case until future requirements of Standard No. 208 are established, and that General Motors' developmental work be undertaken on the basis of a temporary exemption under 49 CFR Part 555. This approach has not been adopted by the NHTSA. In light of the financial commitments that might be involved, this agency has concluded that General Motors is entitled to the assurance that their developments on advanced Standard No. 208 systems will not be barred by Standard No. 203 in the future.

In consideration of the foregoing, paragraph S3 (application) in Standard No. 203 (49 CFR § 571.203) is amended. . . .

Effective date: [30 days following date of publication of the amendment in the *Federal Register*]. Because this amendment relieves a restriction, it is found for good cause shown that

an effective date sooner than 180 days from the date of its publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on April 17, 1975.

James B. Gregory
Administrator

40 F.R. 17992
April 24, 1975

MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection for the Driver from the Steering Control System—Passenger Cars

S1. Purpose and scope. This standard specifies requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact.

S2. Application. [This standard applies to passenger cars. However it does not apply to vehicles that conform to the frontal barrier crash requirements (S5.1) of Standard No. 208 (§ 571.208) by means other than seat belt assemblies. (40 F.R. 17992—April 24, 1975. Effective: 5/27/75)]

S3. Definitions. "Steering control system" means the basic steering mechanism and its associated trim hardware, including any portion of a steering column assembly that provides energy absorption upon impact.

S4. Requirements.

S4.1 Except as provided in S4.2, when the steering control system is impacted by a body block in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965 or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds.

S4.2 A Type 2 seat belt assembly that conforms to Motor Vehicle Safety Standard No. 209 shall be installed for the driver of any vehicle with forward control configuration that does not meet the requirements of S4.1.

S4.3 The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

[Interpretation

The term "Jewelry" in paragraph S4.3 refers to watches, rings, and bracelets without loosely attached or dangling members. (32 F.R. 3390—March 1, 1967)]

32 F.R. 2414
February 3, 1967

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting—Passenger Cars

A proposal to amend Part 371 of the Federal Motor Vehicle Safety Standards by adding a Standard No. 212, Windshield Mounting—Passenger Cars, was published as an advance notice of proposed rule making an October 14, 1967 (32 F.R. 14281) and a notice of proposed rule making on December 28, 1967 (32 F.R. 20866).

Interested persons have been given the opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

This new standard requires that, when tested as prescribed, each passenger car windshield mounting must retain either: (1) not less than 75% of the windshield periphery; or (2) not less than 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline, if an unrestrained 95th percentile adult male manikin is seated in each outboard front seating position.

Several comments objected to the proposed standard and in some cases urged that more research should be done before any type of windshield mounting is required. The standard, is however, part of an integrated program aimed at accomplishing the widely accepted safety goal of keeping occupants within the confines of the passenger compartment during a crash. One major step in this program is the utilization of the laminated glazing material prescribed in Federal motor vehicle safety standard No. 205, which has resulted in a marked reduction in serious head injury to occupants known to have struck the windshield. The windshield mounting retention requirement prescribed in this standard takes advantage of this improved glazing material and will further minimize the likelihood of occupants being thrown from the vehicle during a crash.

Several comments requested reduction of the 75% retention requirement to 50%. The Administrator concludes that, as an alternative, 50% retention is acceptable if: (1) an unrestrained 95% percentile adult male manikin is seated in each outboard front seating position when the test procedure is performed, and (2) at least 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline is retained.

Several comments requested that the phrase "or approved equivalent" be added to the "Demonstration procedures" provision. § 371.11 of the Federal motor vehicle safety standards provides that "an approved equivalent may be substituted for any required destructive demonstration procedure." Consequently, inclusion of the phrase requested is not necessary.

In consideration of the foregoing, § 371.21, of Part 371 of the Federal motor vehicle safety standards is amended by adding Standard No. 212, "Windshield Mounting—Passenger Cars," as set forth below, effective January 1, 1970.

This rule-making action is taken under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (P.L. 89-563, 15 U.S.C. §§ 1392 and 1407) and the delegation of authority contained in Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 1).

Issued in Washington, D.C. on August 13, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 11652
August 16, 1968

MOTOR VEHICLE SAFETY STANDARD NO. 212

Windshield Mounting

S1. Scope. This standard establishes windshield retention requirements for motor vehicles during crashes.

S2. Purpose. The purpose of this standard is to reduce crash injuries and fatalities by providing for retention of the vehicle windshield during a crash, thereby utilizing fully the penetration-resistance and injury-avoidance properties of the windshield glazing material and preventing the ejection of occupants from the vehicle.

S3. Application. [This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating of 10,000 pounds or less. However, it does not apply to forward control vehicles, walk-in van-type vehicles, or to open-body type vehicles with fold-down or removable windshields. (42 FR 34288—July 5, 1977. Effective: 9/1/78)]

S4. Definition. "Passive restraint system" means a system meeting the occupant crash protection requirements of S5 of Standard No. 208 by means that require no action by vehicle occupants.

S5. Requirements. When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, under the conditions of S6, the windshield mounting of the vehicle shall retain not less than the minimum portion of the windshield periphery specified in S5.1 and S5.2.

S5.1 Vehicles equipped with passive restraints. Vehicles equipped with passive restraint systems shall retain not less than 50 percent of the portion of the windshield periphery on each side of the vehicle longitudinal centerline.

S5.2. Vehicles not equipped with passive restraints. Vehicles not equipped with passive restraint system shall retain not less than 75 percent of the windshield periphery.

S6. Test conditions. The requirements of S5 shall be met under the following conditions:

S6.1 The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S6.2, a passenger car is loaded to its unloaded vehicle weight plus its cargo and luggage capacity weight, secured in the luggage area, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position.

(b) Except as specified in S6.2, a multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight, plus 300 pounds or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position. The load is distributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy weight exceeds the axle's proportional share of the test weight, the remaining weight is placed so that the weight on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the weight of work-performing accessories.

S6.2 The fuel tank is filled to any level from 90 to 95 percent of capacity.

S6.3 The parking brake is disengaged and the transmission is in neutral.

S6.4 Tires are inflated to the vehicle manufacturer's specifications.

S6.5 [The windshield mounting material and all vehicle components in direct contact with the mounting material are at any temperature between 15°F and 110°F. (42 FR 34288—July 5, 1977. Effective: 9/1/77)]

41 F.R. 36493
August 30, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 215

Exterior Protection—Passenger Cars

(Docket Nos. 1–9 and 1–10; Notice No. 4)

The purpose of this notice is to establish a new Federal Motor Vehicle Safety Standard No. 215, Exterior Protection—Passenger Cars. The standard will require passenger cars to withstand specified low-speed impacts at the front and rear without damage to lighting, fuel, exhaust, cooling, or latching systems. A public meeting on the subject was held on April 2, 1970, and a notice of proposed rulemaking was published on November 24, 1970 (35 F.R. 17999). The comments received at the meeting and in response to the notice have been considered in the preparation of this rule. The standard is intended to achieve the goals of preventing low-speed collisions from impairing the safe operation of vehicle systems and of reducing the frequency of override or underride in collisions at higher speeds.

Many comments to the docket indicated that manufacturers would encounter substantial difficulties in meeting the pendulum-test requirements at the beginning of the 1973 model year. The industry evidently has been preparing for a substantial upgrading of passenger car bumpers for the 1973 models. There are, however, considerable differences in the designs selected, with respect to such aspects as the height of the bumpers, both top and bottom, the extent to which they protect the vehicle corners, the material with which they are faced and the details of their configuration. All these aspects have a considerable effect on whether the vehicles would meet the pendulum-test requirement. In the pendulum test a precisely configured block is used as a striker, with the requirement that only a particular projecting ridge on the block may contact the vehicle. The difficulties of compliance are compounded by the fact that manufacturers are in an advanced stage of preparation for the 1973 models.

Some of the comments to the docket suggested that a barrier test should be substituted for the pendulum, at least for the first phase of the requirements. A barrier test does not by itself involve the configuration of the front and rear contact surfaces. It does, however, establish the basic strength of those surfaces and the supporting structures, and the vehicle's overall ability to withstand impacts at the specified energy levels. It has been decided, therefore, to utilize fixed barrier collision tests in the first phase, model year 1973, and upgrade the requirements by adding pendulum tests for model year 1974.

It was suggested in several of the comments that less bumper strength was needed on the rear than on the front, since vehicles are struck less frequently and less severely, from a statistical standpoint, from that direction. Many of the designs presently in preparation for 1973-model production offer rear protection in the 2-to-3-m.p.h. range, as compared with 5 m.p.h. at the front. In recognition of these factors, the requirement for rear impact protection on 1973 models is a barrier impact at 2½ m.p.h., while the front is required to meet a 5-m.p.h. barrier impact.

For the 1974 models (effective September 1, 1973), a pendulum test requirement is added in a form similar to that proposed in the November 24 notice, with a front impact speed of 5 m.p.h. and a rear impact speed of 4 m.p.h.

Several manufacturers stated that the requirement for multiple impacts on front and rear was too severe. The NHTSA considers it essential for a bumper to be able to sustain an impact without impairment of its protective capabilities, and has

therefore retained the multiple impact requirement. However, it is recognized that the requirement as proposed would permit up to six impacts at the same point and that the vehicle could fail to conform simply by denting the bumper until it contacts a plane surface of the test device. Accordingly, the standard provides that impacts must be at least 2 inches apart laterally.

A related concern expressed in several comments was that the vehicle corners would have to be very stiff in order to withstand longitudinal impacts in which most of the test device would be outboard of the corner. Since corner protection is also required and a separate corner impact procedure is provided, the Administration has determined that the longitudinal impacts should be conducted with the test device completely inboard of the corners, and has amended the requirement accordingly.

The configuration of the test device's impact face attracted several comments. Upon review, it has been decided that a 3-inch offset in the upper portion of the device is unnecessary to establish the upper limit on the height of the vehicle's protective surface. For impacts at a height of 20 inches, the upper surface (plane B) is therefore offset by 1½ inches rather than 3 inches. Several comments indicated that the cross section radius of the impact ridge should be increased from ½ inch to 1 inch or more or that the ridge should be removed altogether. Review of the reasons advanced for the proposed changes does not give sufficient cause to change the shape of the ridge. Its design is intended to represent a fairly hostile impacting surface, but it is not unrepresentative of the objects likely to be encountered by a vehicle.

A number of comments stated that the requirement for a corner impact at 45° was too severe and that it would necessitate undesirable changes in the bumper wrap-around. Upon consideration of these comments and supporting data reguarding the frequency of angular impacts, it has been decided to reduce the direction of the corner impact to 30° from longitudinal.

It appeared from the comments that one of the most difficult problems from the standpoint of vehicle design arose from the requirement that impacts be conducted at any height from 20 inches to 14 inches. To assure themselves of conformity at the 14-inch height, manufacturers of larger cars would have had to lower the bumper to a point where it would significantly interfere with the vehicle's ability to negotiate driveways and ramps. A 6-inch range in the test heights was found unnecessary, since manufacturers will have to exceed the range somewhat to ensure conformity. Accordingly, the NHTSA has decided to raise the minimum test height to 16 inches. As adopted the standard specifies three impacts, front and rear, at any height between 20 inches and 16 inches.

Although the standard does not permit repairs to be conducted after an impact, the Administration has found merit in the suggestion that an interval should be specified between tests to permit systems with self-recovery features to return to their original position. Accordingly, an interval of 30 minutes is specified between impacts.

One comments pointed out that confusion might arise from the manner in which the test device's weight was specified. The standard therefore refers to the effective impacting mass of the test device and specifies that this mass is equal to the mass of the impacted vehicle.

Further work is in process with respect to the requirements effective September 1, 1973, and it is anticipated that additions to or refinements of those requirements would be made in the near future.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 215, Exterior Protection, is added to § 571.21 of Title 49, Code of Federal Regulations, reading as set forth below.

Effective date, September 1, 1972, with further requirements effective September 1, 1973, as noted in the text of the rule. Because of the leadtime necessary for preparation for production, it is found, for good cause shown, that an effective date more than 1 year later than the issue date is in the public interest.

Issued on April 9, 1971.

Douglas W. Toms.
Acting Administrator.

36 F.R. 7218
April 16, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 215

Exterior Protection—Passenger Cars

(Dockets No. 1–9 and 1–10; Notice 5)

The purpose of this notice is to respond to petitions requesting reconsideration of Motor Vehice Safety Standard No. 215, *Exterior Protection*, issued April 9, 1971 (36 F.R. 7218). The petitions are denied in part and granted in part. To the extent that changes to the standard in response to petitions have been found to add to the performance requirements, they are included in a notice of proposed rulemaking published in this issue of the *Federal Register* (36 F.R. 11868).

Subsequent to issuance of the standard, petitions for reconsideration were submitted by Chrysler, American Motors, Fiat, Japanese Automobile Manufacturer's Association, Peugeot, Ford, General Motors, Center for Auto Safety, Volkswagen, DeTomaso, and Mr. Jack F. Fenton, a member of the California State Assembly. In issuing this notice, the NHSTA has reviewed each of the issues raised in the petitions.

Few petitioners took issue with the fixed barrier impact requirement effective January 1, 1972. Two European manufacturers requested that the frontal speed be lowered to 2½ mph. No supporting data were submitted, however. The NHTSA continues to regard a 5-mph impact as an appropriate measure of frontal protection and the petitions are denied. Among the domestic manufacturers, American Motors requested that the license plate lamps be exempted from the protective criteria of S5.3.1, on the grounds that the best location for the license plate lamps is in a bumper insert that is difficult to insulate from shock. Since the license plate lamps have little bearing on operational safety, and their protection would in some cases require a disproportionate degree of design alteration ,the request appears reasonable and the license plate lamps are exempted from the protection criteria.

The pendulum impact test requirements, effective September 1, 1973, were the subject of a divergent group of comments. With its multiple impacts at varying heights at 5 mph in the front and 4 mph in the rear, the pendulum test imposes two basic requirements: the management of the total energy of the pendulum, and the configuration of the front and rear surfaces in order to accommodate the pendulum's impact ridge.

Because of the limited width of the pendulum, as compared to a fixed collision barrier, the energy imparted by the pendulum to the portion of the vehicle it strikes is roughly equivalent to the energy transmitted to that portion during a barrier test at the same speed. The rear 4-mph pendulum test therefore approximates the energy level of a 4-mph barrier test and represents an appreciable increase over the 2½ mph rear barrier test required in 1972. General Motors requested a postponement of the 4-mph requirement to 1975 to minimize the costs of retooling necessary to meet the increased requirements. It has been determined that early adoption of the 4-mph pendulum test is desirable, and the requested postponement is therefore denied. In light of the responses to the rulemaking, the NHTSA is considering additional rulemaking to increase the pendulum speed, as well as the barrier speed, to 5 mph for rear impacts. This course of action is advocated in petitions by the Ford Motor Company, The Center for Auto Safety, and Mr. Fenton, and is proposed in a notice published in this issue of the *Federal Register* (36 F.R. 11868).

A number of petitions stated that the width and aggressiveness of bumpers that can withstand 5-mph corner impacts will create safety problems in various types of impact situations, and that the overall balance of vehicle protection

and crash-worthiness would be better served by setting the impact requirements for the vehicle corners at a somewhat lower level. Review of the available information indicates that this position has merit, and an adjustment is therefore made in the speed of corner impacts, from 5 mph in the front and 4 mph in the rear, to 3 mph at both front and rear.

The impact ridge on the pendulum test device performs the vital functions of assuring basic uniformity in bumper height and of limiting the surface angularity that contributes to underride and override. The NHTSA adheres to its finding that the impact ridge is a reasonable and practicable means of assuring the desired protection. It appears, however, that the shape of the ridge as the standard was issued—its cross section an equilateral triangle with a rounded apex—could produce some undesirable side effects. Petitioners argued that this relatively narrow and sharp ridge unjustifiably restricts the use of resilient materials and energy-absorbing designs that represent the most effective methods of meeting the objectives of the standard. Petitioners variously requested that contact with the plane behind the ridge be permitted, or that the impact ridge be broadened, thereby reducing its tendency to indent the vehicle's surface.

Upon review, it has been determined that a broadening of the ridge is desirable, both because of the greater latitude allowed in the selection of resilient materials, and because of other effects on the size and shape of the bumpers. Several petitions argued that the present standard requires a manufacturer to design an excessively wide bumper in order to meet the protective criteria under the full range of vehicle weights and manufacturing tolerances. A broader impact ridge would alleviate this problem, and should also reduce the penetration of the license plate opening that was seen as a problem by some manufacturers. The NHTSA has determined that most of the meritorious requests in the petitions can be satisfied by the adoption of a broader impact ridge. The pendulum design suggested by the Ford Motor Company has been found to have considerable merit, and the standard is therefore amended to incorporate impact ridge dimensions similar to those requested by Ford. To the extent that the remaining petitions relating to bumper height and shape are not satisfied by this amendment, they are denied. The Chrysler request to limit corner testing to 20-inch height is premised on difficulties that are partially alleviated by the modification of the ridge, and the petition in that respect is accordingly denied.

General Motors requested that the height range for the pendulum test be changed to 18-to-22 inches, from the present 16-to-20 inch specification. On review of all avaiable information, NHTSA has determined that such a change would not be desirable, and the petition is denied. It should be noted, however, that the amended design of the impact face retains the 3-inch separation between the upper edge of the ridge and Plane B, so that manufacturers may design bumers extending some distance above the 20-inch level.

In response to requests to clarify the sequence of testing in effect September 1, 1973, S5.2 is amended to make it clear that the pendulum tests are to precede the barrier tests. Other minor adjustments have been made in the protective criteria to make it clear that the vehicle's hood, trunk, and doors—and not just their latching systems—must be operable in the normal maner (S5.3.2), and to substitute the more general term "leaks" in S5.3.4 in place of the term "open joints."

The petition from the Center for Auto Safety suggested the addition of further protective criteria to ensure substantially complete vehicle protection. A notice proposing such additional criteria is published in today's issue of the *Federal Register* (36 F.R. 11868). The Center also requested the addition of requirements limiting the acceleration imparted to occupants during impacts. The Ford Motor Company also suggested that the NHTSA consider rulemaking relating to limits on occupant acceleration, and indicated that it intended to submit data on the subject in September of 1971. Although review of the available information does not indicate that occupant accelerations will be significantly increased in vehicles conforming to the standard, the NHTSA is aware of the issue and will consider further rulemaking on the subject if subsequent data reveals a problem.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 215, Exterior Protection, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . . Effective date: September 1, 1972 and September 1, 1973. The amendments to the protective criteria are effective September 1, 1972. The amendments to S5.2, S7.2.5, and Figures 1 and 2 are effective September 1, 1973.

Issued on June 15, 1971.

Douglas W. Toms
Acting Administrator

36 F.R. 11852
June 22, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 215

Exterior Protection

(Dockets No. 1–9 and 1–10, Notice 7)

The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 215, in § 571.21 of Title 49, Code of Federal Regulations. The amendments are based on a review of all materials heretofore submitted to the docket, including a petition for reconsideration by the Japanese Automobile Manufacturers Association (JAMA). They also constitute action on the notice of proposed rulemaking of June 22, 1971 (36 F.R. 11868).

As published June 22, 1971, (36 F.R. 11852), Standard No. 215 became effective in two phases. The first phase, beginning September 1, 1972, requires a passenger car to meet certain protective criteria in barrier impacts at 5 mph in the front and 2½ mph in the rear. The second phase, effective September 1, 1973, required a car to meet the protective criteria during and after an additional series of impacts with a weighted pendulum, at 5 mph in the front, 4 mph in the rear and 3 mph on the vehicle corners.

Simultaneously with the publication of the standard on June 22, the NHTSA proposed amendments in the second phase of the requirements that would increase the protection required by the standard (36 F.R. 11868). The velocities in rear impacts were to be raised to 5–mph for both barrier and pendulum testing, the vehicle's engine was to be running during a barrier impact, and the list of protective criteria was to be enlarged to include a general prohibition against damage that adversely affects any aspect of performance that relates to motor vehicle safety.

The petition for reconsideration by JAMA requested a one year delay in the 5–mph front and 4–mph rear pendulum impact requirements contained in the June 22 rule. The NHTSA has concluded that a uniform delay in the pendulum requirements is not justified, in that for the majority of vehicles the cost of improved protective systems in 1973 is outweighed by their benefits. The JAMA petition is therefore denied.

With respect to the amendments proposed in the notice of June 22, a number of comments objected to the proposed increase in the velocity of rear barrier impacts for the reason that it would require additional time for compliance and that it would increase the cost of the protective system without corresponding benefits to the consumer. On review, the NHTSA has concluded that the benefits of 5–mph rear bumper protection will outweigh the costs involved. Basic 5-mph barrier-impact protection can be provided with a variety of available devices and designs, which do not themselves generally require extensive vehicle sheet-metal changes. The requirement of meeting the damage criteria in a 5–mph impact, front and rear, is therefore adopted, effective September 1, 1973.

The notice of June 22, 1971, also proposed to increase the speed of the pendulum test device in rear impacts to 5–mph, effective September 1, 1973. Several comments raised lead time objections. Upon review of the information concerning tooling costs and other costs associated with a 5–mph rear pendulum test in 1973, the NHTSA has concluded that for the majority of vehicles the benefits to the public outweigh any incremental cost associated with the 1973 effective date, and September 1, 1973, is established as the effective date for most vehicles.

The NHTSA has determined, however, that with respect to certain vehicles, the detailed configurational requirements imposed by the pendulum tests cause severe leadtime problems. The

vehicles having the greatest difficulties are concentrated in the smaller classes, particularly small convertibles, hardtops, and sports-type cars. It has been determined that if these vehicles were forced to comply with the pendulum tests by the September 1, 1973 date, a substantial disruption of the manufacturers' production and tooling schedules would result, with extremely large cost penalties. In view of the adverse effect that this would probably have both on manufacturers' other safety-related development programs, and on consumer costs, a one-year delay in the pendulum test requirements with respect to the limited class of vehicles most severely affected has been found to be in the public interest. An exception has therefore been made in the application of the pendulum test requirements to passenger cars with wheel base of 115 inches or less, if they are convertibles, vehicles with no back seat, or "hardtops" (vehicles with no "B pillar" above the bottom of the window opening). These cars must meet the requirement one year later, by September 1, 1974. This exception does not affect the barrier crash test requirements, which go into effect as proposed with respect to all passenger cars.

In response to repeated requests from manufacturers to alleviate the retooling and restyling problems associated with corner impacts at heights below 20 inches, the NHTSA has determined that a two year delay in the implementation of S7.2.2, to September 1, 1975, would allow for more economical changeover and amends the standard accordingly. The requirement for corner impacts at 20 inches (S7.2.1) remains effective September 1, 1973, and will provide a significant level of protection for the period before the effective date of S7.2.2.

The new condition regarding engine operation caused some uncertainly among the commenters as to whether the engine must remain running for any length of time after initial contact with the barrier. Temporary engine stalling at low speeds is not considered a major safety problem, nor would it alone constitute damage within the meaning of the standard. If the engine cannot be restarted, of course, some damage would be indicated, and the vehicle would fail to conform to the protective criterion proposed by the June 22 notice. To clarify this point, the NHTSA has decided to amend the test condition to provide that the engine is operating "at the onset of a barrier impact."

The proposed addition to the protective criteria was criticized for what was said to be a lack of objectivity, in that it does not identify the aspects of performance relating to motor vehicle safety and does not specify the manner in which they may be adversely affected. As an alternative, it was suggested that the NHTSA list the specific systems that must remain fully operative after the vehicle has been tested. This suggestion has merit, in that it would eliminate uncertainty as to which systems must be examined for damage after the tests have been performed. The vehicle propulsion, suspension, steering, and braking systems have been identified in this regard.

The suggestion that the particular prohibited effects on given systems be specified has not, however, been adopted. It is impracticable, and probably impossible, to specify in a standard all foreseeable types of damage or impairment that could occur to a complex system such as steering or front suspension. Any motor vehicle must, on the other hand, be designed so as to withstand without damage the types and degrees of shocks and stresses that it will encounter in normal road use (aside from normal wear that occurs with extended use, which is not at issue here.) The NHTSA has therefore found it reasonable to require manufacturers to design their vehicles, including the front and rear bumper systems, in such a manner that specified safety-related systems suffer no damage, remain in proper adjustment, and continue to operate in the normal manner.

One clarifying amendment has been adopted as a result of comments on the requirement of S5.3.1 that the vehicle "shall comply with the applicable visibility requirements of section S4.3.1.1 of Motor Vehicle Safety Standard No. 108." Ford suggested that the quoted language might not cover the appropriate aspects of lighting performance, and therefore requested a reference to Table III of Standard No. 108. Upon review of the question, the NHTSA agrees that the comprehensive nature of S5.3.1 should be more strongly indicated, but finds that the omis-

sion of some categories of lights from Table III make it an inadequate reference. Instead, it has been decided to strike the limiting reference to section S4.3.1.1 of Standard No. 108 and to refer broadly to the "applicable requirements of Motor Vehicle Safety Standard No. 108." Use of this more general phrase makes the reference to the headlamp adjusment requirements unnecessary and that sequence is accordingly deleted.

In a separate petition for rulemaking, American Motors has requested an amendment to permit the removal during pendulum tests, of "bumper protective strips" made of resilient material with specified characteristics. Although the NHTSA recognizes that resilient materials may be used to advantage on automobile bumpers, it regards the June 22 amendment of the impact ridge as the most satisfactory means of permitting such materials. By permitting removal of such materials during testing the standard would no longer effectively control the contour of the vehicle's bumper and its interaction with other vehicles during low speed impacts. The petition is therefore denied.

By reason of the foregoing, Motor Vehicle Safety Standard No. 215, Exterior Protection, is amended. . . .

Effective date: September 1, 1972, except as otherwise noted in S5.2.

Issued on October 18, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 20369
October 21, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 215

Exterior Protection

(Docket No. 1–9 and 1–10; Notice 8)

The purpose of this notice is to respond to petitions requesting reconsideration of certain amendments to Federal Motor Vehicle Safety Standard No. 215, *Exterior Protection*, 49 CFR § 571.215, issued on October 18, 1971 (36 F.R. 20369, October 21, 1971). After issuance of the amendments, petitions were filed pursuant to 49 CFR 553.35 by American Motors, Ford, General Motors, and Chrysler. The petitions are granted in part and denied in part.

Each of the petitioners objected to the amendment of section S5.3.1. The section had formerly provided that, after impact, the vehicle's lamps and reflectors had to meet the visibility requirements of S4.3.1.1 of the Standard No. 108. Upon closer review of S5.3.1, the NHTSA concluded that the breadth of the protection that the section was intended to require might not be adequately conveyed by referring only to Standard No. 108's visibility requirements. It was therefore decided to broaden the reference to Standard No. 108, to refer to "the applicable requirements" of that standard.

The broadening of the reference to Standard No. 108 appears to have had a greater impact on manufacturers than was expected. After review of the petitions, the NHTSA has concluded that opportunity should be given for additional comment on the subject of lighting. The language of S5.3.1 is therefore changed to its original form. In a notice of proposed rulemaking published today in the *Federal Register* (36 F.R. 23831) amendments are proposed to S5.1 and S5.3.1 that will require vehicles manufactured after September 1, 1973, to meet the photometric requirements of Standard No. 108, as well as the visibility requirements.

The Ford Motor Company stated that the requirement of S5.3.4 that "the vehicle's exhaust system shall have no leaks or constrictions," would preclude the use of drip holes to remove condensation and, in addition, would not allow constrictions where tubing must be bent for proper routing. Standard No. 215 is not intended to prohibit such design features, but only to prohibit damage resulting from the impacts specified in the standard. Accordingly, design drip holes are not considered to be "leaks," and "constrictions" does not include the normal design configuration of the exhaust system. The amendment requested by Ford is considered unnecessary, and the petition is therefore denied.

General Motors objected to the requirement of S5.3.5 that specified vehicle systems shall "suffer no damage." The company stated that the phrase was not objective and was therefore inappropriate for a standard. On reconsideration, the NHTSA has concluded that the other protective requirements of S5.3.1 afford adequate protection and that the benefits resulting from the no-damage requirement are not significant enough to justify its continuance as part of the standard. S5.3.5 is therefore amended by deleting the phrase "suffer no damage."

In its petition, General Motors repeated its objection to the requirement for corner impacts at heights below 20 inches (S7.2.2). As in its previous comments on the subject, the company requested an amendment to permit contact with Plane A of the test device in such impacts. The NHTSA has previously rejected this request, and on reconsideration finds no sufficient cause to alter its position. A primary effect of requiring impacts below 20 inches is to establish a fairly broad and non-hostile surface at the vehicle's corners. The shape of the impact ridge is such that if the no-contact requirement applied only

at the 20-inch height, the standard would not prevent the manufacture of bumpers with blade type corners. The NHTSA considers that the extension of time previously granted for conformity with S7.2.2 (to September 1, 1975) is adequate for the redesign of sheet metal, if this is necessary, and declines to amend the standard further with respect to corner impacts.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 215, Exterior Protection, § 571.215 of Title 49, Code of Federal Regulations, is amended. . . .

The foregoing amendments are issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407 and the delegation of authority at 49 CFR 1.51.

Issued on December 9, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 23802
December 15, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 215

Exterior Protection

(Docket No. 1–9; Notice 11)

The purpose of this notice is (a) to amend Motor Vehicle Safety Standard No. 215, *Exterior Protection*, 49 CFR § 571.215, to permit the removal of bumper hitches during the required impacts; (b) to amend the headlamp adjustment requirements of S5.3.1 of the standard; and (c) to terminate rulemaking with respect to other amendments proposed to S5.3.1 of the standard by notice of December 15, 1971 (36 F.R. 23831).

The amendment to permit removal of trailer hitches was proposed on January 22, 1972 (37 F.R. 1059) in response to a petition for rulemaking by General Motors, who stated that factory installation of trailer hitches would have to be discontinued if their removal were not permitted during testing. In proposing the amendment, the agency noted that if factory installation were to cease, as appeared likely, the effect would probably be to increase the number of hitches installed after purchase.

Two comments expressed reservations about the proposal. The Automobile Club of Southern California expressed concern about the effects of the trailer hitch on the fuel tank in rear end collisions. The Center for Auto Safety stated that the proper functioning of a trailer hitch is essential for safe towing and that the hitch should therefore be regulated in the same manner as the other safety systems specified in the standard. Even if the standard were to apply to hitches, however, the applicable requirement would be the non-contact requirement of S5.3.6, and it is not at all certain that compliance with this requirement would produce a superior trailer hitch. The discontinuance of factory installations would probably not improve the situation in any case. The improvements in trailer hitches which the Center and the Automobile Club seek would thus appear to lie outside the scope of Standard No. 215. The proposed amendment is therefore being adopted as proposed.

In response to the proposal, a question has been raised concerning the intent of the requirement that "the aim of each headlamp shall be adjustable in accordance with the applicable requirements of Standard No. 108". General Motors stated that the reference should be more specific and suggested a reference to Table 1 of SAE Recommended Practice J599b, Lighting Inspection Code. American Motors stated that it considers two of the SAE Standards subreferenced by Standard No. 108—SAE J579a and J580a—to be based entirely on laboratory bench tests and not upon on-vehicle tests.

This agency disagrees with American Motors, and considers J580a to be an on-vehicle test as well as a laboratory bench test. It has concluded, however, that J580a and the other SAE Standards referenced by Standard No. 108 are less suited to the purposes of Standard No. 215 than are the provisions of the lighting inspection procedure of SAE J599b. Standard No. 215 is intended to protect the headlamps so that they can be adjusted to throw a satisfactory pattern of light. Accordingly, it has been decided to amend the last sentence of S5.3.1 of Standard No. 215 to refer to the table in SAE Recommended Practice J599b that sets out the aiming requirements for headlamps.

The notice of proposed rulemaking, published on December 15, 1971, proposed to require the lights to be operable after the test impacts and to require them to meet the photometric requirements of Standard No. 108. Upon review of the comments and further evaluation of the potential effects of the proposed requirements, it has been concluded that neither is likely to produce a

significant upgrading of vehicle protection, and that their costs would far outweigh their benefits.

The preamble to the notice indicated that the intent of the operability requirement was to prevent filament breakage. Most of the comments pointed out that the SAE requirements incorporated by Standard No. 108 do not prohibit filament failure during endurance tests, and in fact expressly permit replacement in the event of failure. This is consistent with the prevailing treatment of bulb replacement as a part of routine maintenance. In light of this fact, and of the small amount of time and energy involved in replacing a bulb, it has been decided not to adopt the proposed requirement that the lamps (*i.e.*, the bulbs) be operable.

The photometric requirements of Standard No. 108 are those of several SAE lighting standards. Each of these standards consists of a series of laboratory test procedures. On review of the comments, which are unanimous in their claim that the SAE laboratory procedures are difficult to adapt to the circumstances of Standard No. 215 and that they go beyond the stated purpose of the standard, it has been decided not to adopt the photometric requirements. Thus, the protective criteria with respect to lighting will continue to be visibility, headlamp aiming, and freedom from cracks.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 215, Exterior Protection, 49 CFR § 571.215, is amended . . . .

Effective date: September 1, 1972.

Because this amendment modifies an existing rule in a manner that imposes no additional substantive requirements, it is found for good cause shown that an effective date less than 180 days from the date of issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 14, 1972.

Douglas W. Toms
Administrator

37 F.R. 16803
August 19, 1972

Zero Yaw

Original Configuration

Square Front End

18" Vertical Corner Radius

18" Roof Radius

24" Roof Radius & 18" Corner Radius

24" Roof & Bottom Radius & 18" Corners

Leading Edge to Hump & Windshield Filled

NASA TM X-56027

Full Scale at 60 mph Fineness Ratio

Config.	Front	Rear	Under
A	Sq.	Sq.	Exp.
B	Vr Rnd. Hr Sq.	Vr Rnd. Hr Sq.	Exp.
C	Rnd.	Rnd.	Exp.
D	Rnd.	Rnd.	Full Seal
E	Rnd.	Rnd.	3/4 Seal
F	Rnd.	Sq.	3/4 Seal

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* Hoerner, Fluid Dynamic Drag, Sq. Cornered, (.1h) & Full Seal respectively

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