U.S. Department of Transportation
National Highway Traffic Safety Administration

SAFETY PROGRAMS FOR LIGHT TRUCKS AND SPORT UTILITY VEHICLES

1990

U.S. Department of Transportation
National Highway Traffic Safety Administration
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I: EXECUTIVE SUMMARY

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The National Highway Traffic Safety Administration (NHTSA) administers the Federal government's programs to promote safe driving and safe vehicles, and is vitally concerned with all aspects of highway safety, including the Federal motor vehicle safety regulations applicable to light trucks and vans (LTVs).[1]

In light of the substantial growth in LTV sales in recent years, NHTSA has been upgrading the safety standards for those vehicles, as well as for passenger cars. The agency is also continuing to emphasize the critical importance of following basic highway safety rules -- such as driving sober, using safety belts, and observing speed limits -- for all motorists in LTVs, as well as in other vehicles.

Our traffic crash data indicate that when the number of occupant deaths in cars and LTVs is compared to the number of registered vehicles, the resulting fatality rates for the two groups are virtually identical. However, there are differences among the sub-classes of LTVs, and differences according to type of crash involvement. While LTVs already have a safety record comparable to cars, NHTSA believes there are some opportunities to improve that record by upgrading vehicle safety. Most of the agency's passenger car safety standards have applied to LTVs for many years. However there are a few which do not. The agency is committed to broaden those regulations where appropriate.

The design and the applicability of light trucks began to change in the 1970's with a trend toward greater passenger use of light trucks and a shift toward more compact vehicles. Consequently NHTSA began in the late 1970's to extend the applicability of its passenger car Federal Motor Vehicle Safety Standards (FMVSSs) to light trucks.

To improve the protection provided to LTV occupants in a crash, the agency extended two crashworthiness standards to those vehicles: FMVSS No. 212, Windshield Mounting - which set windshield retention requirements, and FMVSS No.219, Windshield Zone Intrusion - which regulates the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test.

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[1] Throughout this report "LTVs" is used as a general term referring to truck and sport utility vehicles with a gross vehicle weight rating of 10,000 pounds or less, including pickup trucks, mini-vans, and full-size vans.

Subsequently the agency also extended to LTVs FMVSS No. 115, Vehicle Identification Number - which requires a unique identification number on each vehicle to reduce the number and seriousness of vehicle accidents by increasing the accuracy and efficiency of vehicle recall campaigns.

During the late 1970's and early 1980's, to further improve the ability of LTVs to avoid crashes and to protect occupants when crashes occur, the agency extended three other crashworthiness standards to LTVs: FMVSS No. 201, Occupant Protection in Interior Impacts - which requires better instrument panel padding, FMVSS No. 203, Impact Protection for the Driver From the Steering Control - requiring the use of energy absorbing steering columns, and FMVSS No. 204, Steering Control Rearward Displacement - which requires limits on the rearward movement of the steering wheel in vehicles with an unloaded weight of 4000 pounds or less. The agency also extended the requirements of its hydraulic brake standard, FMVSS No. 105 Hydraulic Brake Systems, to LTVs. In addition, the standard on Theft Protection (FMVSS No. 114) was extended to LTVs to reduce incidents of theft and subsequent disproportionate involvement of those stolen vehicles in injury producing accidents.

More recently, during the period 1987 - 1988, NHTSA extended to LTVs the requirements of FMVSS No. 208, Occupant Crash Protection -- Dynamic Testing of Safety Belts - which set 30 mile/hour crash test criteria for manual safety belt performance, and FMVSS No. 118, Power-Operated Windows, which is essentially for the protection of children. The agency has also completed action to extend FMVSS No. 204, Steering Column Rearward Displacement, to LTVs with an unloaded weight of up to 5500 pounds or a gross vehicle weight of 10,000 pounds or less.

Since his confirmation, Transportation Secretary Samuel K. Skinner has continued to place a high priority on the safety of all transportation systems, including rulemaking for additional LTV safety standards. In a letter dated June 29, 1989, to the Honorable Ernest F. Hollings, Chairman, Senate Committee on Commerce, Science, and Transportation, the Secretary committed the Department to prompt regulatory action in five specific areas for LTVs -- Head Restraints, Side-Impact Protection, Roof-Crush Resistance, Rear-Seat Lap/Shoulder Belts, and Automatic Crash Protection.

The Department has honored these commitments to the Senate. On September 25, 1989, the agency published a final rule to extend to LTVs FMVSS No. 202, Head Restraints - to reduce the frequency and severity of neck injuries in rear-end and other collisions. On November 2, 1989, the agency also published a final rule to extend to LTVs FMVSS No. 208, Occupant Crash Protection -- Rear-Seat Lap/Shoulder Belts - to provide more effective crash protection to occupants of these vehicles. At the same time, the

agency also proposed to extend the requirements for FMVSS No. 216, Roof Crush Resistance, to LTVs, with final action expected in the summer of 1990. More recently, the agency published on December 22, 1989 a Notice of Proposed Rulemaking (NPRM) proposing to extend FMVSS No. 214, Side-Door Strength to LTVs. A decision on a final rule is expected in the fall of 1990. Finally, the agency published on January 9, 1990 a proposal with regard to FMVSS No. 208, Occupant Crash Protection -- Front-Seat Automatic Crash Protection. In this rulemaking, the agency proposes to extend the automatic crash protection requirements (i.e., air bags or automatic safety belts) to LTVs. A decision on a final rule is expected in the fall of 1990.

In addition, the agency intends to initiate rulemaking for LTVs in two other areas. One is FMVSS No. 108, Lamps, Reflective Devices, and Associated Equipment -- Center High Mounted Stop Lamps, to require those lamps on LTVs. A proposal is expected in the spring of 1990.

Also, NHTSA has already granted a petition for rulemaking to develop a rollover protection standard for all passenger cars, as well as for LTVs and has a comprehensive data collection and research program underway to provide the basis for an effective regulation. Most of the crash avoidance research should be completed by mid-1990.

Assuming that these recently accomplished and pending rulemakings are fully implemented throughout the fleet of LTVs, NHTSA estimates that approximately 2,200 lives will be saved and approximately 101,400 injuries will be prevented or reduced in severity annually. This does not include an estimate of potential savings due to rollover protection rulemaking which is still in the research stage.

This report summarizes the agency's safety regulatory activities which are planned or recently completed, as well as research to further improve the safety of LTVs. This report also updates the information in the April 1988 report titled "Safety Programs for Light Trucks and Multipurpose Passenger Vehicles" which was presented to the Committees on Appropriations, U.S. House of Representatives, and U.S. Senate, and which described occupant containment and protection rulemaking and research for LTVs.

SUMMARY OF EXTENSION OF PASSENGER CAR STANDARDS TO LTVs SINCE 1978

STANDARD	DATE PUBLISHED	DATE EFFECTIVE
105 Hydraulic Brake Systems	Jan. 1981	Sept. 1, 1983
108 NPRM Lamps, Reflective Devices, and Associated Equipment (Center High Mounted Stop Lamps)	-----	Pending
	Dec. 1980	Sept. 1, 1983
114 Theft Protection	Aug. 1978	Sept. 1, 1980
115 Vehicle Identification Number	June 1988	Dec. 21, 1988
118 Power-Operated Window System		
201 Occupant Protection in Interior Impact	Nov. 1979	Sept. 1, 1981
	Sept. 1989	Sept. 1, 1991
202 Head Restraints		
203 Impact Protection for the Driver From the Steering Control System	Nov. 1979	Sept. 1, 1981
204 Steering Control Rearward Displacement		
a. Vehicles with a unloaded weight of 4000 pounds or less	Nov. 1979	Sept. 1, 1981
b. Vehicles with a unloaded weight of 5,500 pounds or less	Nov. 1987	Sept. 1, 1991
208 Occupant Crash Protection		
a. Dynamic crash test of seat belts	Nov. 1987	Sept. 1, 1991
b. Rear-seat lap/shoulder belts	Nov. 1989	Sept. 1, 1991
c. NPRM automatic occupant protection	Jan. 1990	Sept. 1, 1993 (Proposed)
212 Windshield Mounting		
a. Vehicles with a GVWR of 10,000 pounds or less	Aug. 1976	Sept. 1, 1977
b. Vehicles with an unloaded weight of 5,500 pounds or less	April 1980	April 3, 1980
214 NPRM Side Door Strength	Dec. 1989	Sept. 1, 1992 (Proposed)
216 NPRM Roof Crush Resistance	Nov. 1989	Sept. 1, 1991 (Proposed)
219 Windshield Zone Intrusion		
a. Vehicles with a GVWR of 10,000 pounds or less	June 1975	Sept. 1, 1976
b. Vehicles with an unloaded weight of 5,500 pounds or less	April 1980	April 3, 1980

II: BACKGROUND

In NHTSA's early years, the agency's regulatory and research approach was based on a clear distinction between the design and intended purpose of passenger cars and light trucks. Unlike passenger cars, light trucks were viewed as being designed and used primarily as cargo-carrying vehicles rather than as people-carrying vehicles. In addition, because light trucks were structurally different than passenger cars, the agency anticipated that occupants of light trucks would not be as vulnerable to injuries as passenger car occupants. Also, car occupants suffered far more deaths and injuries than did occupants of light trucks. Thus, the initial federal motor vehicle safety standards concentrated on requirements for passenger cars, to reduce deaths and injuries in those vehicles.

However, the trend in recent years has been toward more purchases and more passenger-oriented use of LTVs. Between 1970 and 1988 the number of registered LTVs increased from 14.2 to 37.1 million, a 161 percent increase[2]. This compares to an increase in registered passenger cars of 58 percent over the same period. In terms of total vehicle miles of travel, small truck travel increased 256 percent while total travel by passenger cars increased only 56 percent. Therefore, not only were people purchasing more of these vehicles, but the miles per vehicle were increasing in contrast to relatively stable miles per vehicle for passenger cars.

NHTSA responded to this shift starting in the late 1970s, when the agency extended the applicability of several passenger car standards to light trucks and sport utility vehicles. This response has continued since that time, resulting in the high priority rulemakings discussed in this report.

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[2] Federal Highway Administration annual data for the 2 axle-4 tire truck class of vehicle, which closely corresponds to the class of vehicle in this report.

This report is divided into three major sections. The first provides crash data analyses for the years 1985 through 1988 (the latest complete year for which data are available). The second section describes the regulatory activities directed at LTV safety, many of which were previously mentioned in the April 1988 report. The third section provides information on supporting research in LTV safety.

III: CRASH DATA ANALYSIS

This section expands on the April 1988 report, and presents and comments on fatality rates (vehicle occupant fatalities per million registered vehicles) for light trucks and cars by vehicle size and crash mode for 1985 through 1988. The fatality data and analyses are based on information from the Fatal Accident Reporting System (FARS). The vehicle registration data are from R. L. Polk & Co.

Table 1 combines the data for the years 1985 through 1988 to provide an overall perspective. Tables 2a through 2d address overall fatality rates, Tables 3a through 3d summarize distribution of fatalities by crash mode, and Tables 4a to 4d through 7a to 7d are by crash mode: rollover, frontal, side, and rear, respectively.

Tables 2a through 2d present fatality rates and normalized fatality rates[3] for subcategories of cars and light trucks. Since the fatality rates are based on measure of exposure (number of registered vehicles), the rates can be compared to provide the relative risk of being killed in various types of vehicles. The normalized fatality rates enable one to make the direct comparison of vehicle types more easily.

The following are the conclusions drawn from the tables showing fatalities per registered vehicle.

* The fatality rate for all light trucks is not appreciably different than it is for passenger cars, and the rates for four out five types of LTVs are lower than for either small or medium sized passenger cars.

* The fatality rates for small and standard pickup trucks are higher than the average for LTVs; the rate for small pickups is 35 percent higher than the overall average for passenger cars and 12 percent higher than the rate for small cars.

* The fatality rate for vans, including minivans, is less than the LTV average rate, and is only slightly higher than the rate for large cars.

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[3]The normalized fatality rate (column four) is developed by using the third column fatality rate, "Fatalities/Million Registered Vehicle," and dividing the fatality rate for each type of vehicle by the fatality rate for total vehicles, i.e., the last line in column three.

TABLE 1

1985 - 1988 COMBINED YEARS' DATA
(NATIONAL DATA)

FATALITIES PER REGISTERED VEHICLE

EHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
MALL CAR	58,871	233,531	252.1	1.2
EDIUM CAR	22,273	97,872	227.6	1.1
ARGE CAR	17,198	139,919	122.9	0.6
MALL VAN	736	6,116	120.3	0.6
TANDARD VAN	2,965	21,627	137.1	0.7
OTAL VAN	3,701	27,743	133.4	0.6
MALL PICKUP	8,302	29,386	282.5	1.4
TANDARD PICKUP	14,188	65,300	217.3	1.0
PORT UTILITY VEHICLE	3,935	21,090	186.6	0.9
OTAL CARS	98,342	471,322	208.6	1.0
OTAL LT. TRUCKS	30,126	143,519	209.9	1.0
OTAL	128,468	614,841	208.9	1.0

Table 2a (1988 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	15,917	66,264	240.2	1.1
MEDIUM CAR	6,029	25,593	235.6	1.1
LARGE CAR	3,745	29,662	126.3	0.6
SMALL VAN	238	2,480	96.0	0.5
STANDARD VAN	737	5,549	132.8	0.6
SMALL PICKUP	2,471	8,988	274.9	1.3
STANDARD PICKUP	3,706	15,924	232.7	1.1
SPORT UTILITY VEHICLE	1,062	5,147	206.3	1.0
TOTAL CARS	25,691	121,519	211.4	1.0
TOTAL LT TRUCKS	8,214	38,088	215.7	1.0
TOTAL	33,905	159,267	212.4	1.0

Table 2b (1987 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	15,239	59,856	254.6	1.2
MEDIUM CAR	5,639	25,349	222.5	1.1
LARGE CAR	4,098	34,364	119.3	0.6
SMALL VAN	195	1,713	113.8	0.5
STANDARD VAN	765	5,451	140.3	0.7
SMALL PICKUP	2,191	7,844	279.3	1.3
STANDARD PICKUP	3,698	16,327	226.5	1.1
SPORT UTILITY VEHICLE	1,026	4,491	228.5	1.1
TOTAL CARS	24,976	119,569	208.9	1.0
TOTAL LT TRUCKS	7,875	35,826	219.8	1.0
TOTAL	32,851	155,395	211.4	1.0

able 2c (1986 NATIONAL DATA)
ATALITIES PER REGISTERED VEHICLE

EHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
MALL CAR	14,514	54,988	263.9	1.2
EDIUM CAR	5,528	24,738	223.5	1.1
ARGE CAR	4,670	37,284	125.3	0.6
MALL VAN	188	1,213	154.9	0.7
TANDARD VAN	741	5,404	137.1	0.6
MALL PICKUP	1,954	6,861	284.8	1.3
TANDARD PICKUP	3,442	16,870	204.0	1.0
PORT UTILITY VEHICLE	949	4,027	235.7	1.1
OTAL CARS	24,712	117,010	211.2	1.0
OTAL LT TRUCKS	7,274	34,376	211.6	1.0
OTAL	31,986	151,385	211.3	1.0

Table 2d (1985 NATIONAL DATA)
FATALITIES PER REGISTERED VEHICLE

VEHICLE TYPE	FATALS	REGISTERED VEHICLES X (1000)	FATALS/ MILLION R.V.	FATALITY RATE/ AVERAGE FATALITY RATE
SMALL CAR	13,201	52,423	251.8	1.2
MEDIUM CAR	5,077	22,192	228.8	1.1
LARGE CAR	4,685	38,609	121.3	0.6
SMALL VAN	115	710	162.2	0.8
STANDARD VAN	722	5,223	138.2	0.7
SMALL PICKUP	1,686	5,693	296.1	1.4
STANDARD PICKUP	3,342	16,179	206.6	1.0
SPORT UTILITY VEHICLE	898	3,490	257.3	1.3
TOTAL CARS	22,963	113,224	202.8	1.0
TOTAL LT TRUCKS	6,763	31,295	216.1	1.1
TOTAL	29,726	144,519	205.7	1.0