

Technical Report

**Light-Duty Automotive Technology and
Fuel Economy Trends Through 1990**

by

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and
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June 1990

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Technical Reports do not necessarily represent final EPA decisions or positions. They are intended to present technical analysis of issues using data which are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments which may form the basis for a final EPA decision, position or regulatory action.

**U.S. Environmental Protection Agency
Office of Air and Radiation
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY * *

ANN ARBOR, MICHIGAN 48105

OFFICE OF
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JUN 6 1990

MEMORANDUM

SUBJECT: Exemption From Peer and Administrative Review

FROM: Karl H. Hellman, Chief, CTAB *KH*

TO: Charles L. Gray, Jr., Director, ECTD

The attached report entitled "Light-Duty Automotive Technology and Fuel Economy Trends Through 1990" EPA/AA/CTAB/90-03, is a brief analysis of trends to model year 1990.

Since this report is concerned only with the presentation of data and its analysis and does not involve matters of policy or regulations, your concurrence is requested to waive administrative review according to the policy outlined in your directive of April 22, 1982.

Concurrence: *Charles L. Gray, Jr.* Date: 6-7-90
Charles L. Gray, Jr., Dir., ECTD

Nonconcurrence: _____ Date: _____
Charles L. Gray, Jr., Dir., ECTD

cc: E. Burger, ECTD

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I. Abstract

This, the eighteenth in this series of papers and reports, examines trends in light-duty vehicle fuel economy and technology usage through model year 1990.

II. Introduction

Trends are examined herein, as in preceding papers in this series [1-20],* using the latest and most complete EPA data available. The source database was frozen in mid-March 1990.

Through model year 1986, all data are "final CAFE" data. For 1987, the data are final CAFE for all manufacturers for cars and most manufacturers for trucks. For 1988 and 1989, final CAFE data was available for some, but not all manufacturers. For Model Year 1990, fuel economy label data were used, with sales volumes adjusted to agree with post-label (but pre-"final") information reported to the Department of Transportation and in trade publications. This same procedure was used for those manufacturers for which "final" data were unavailable for other years.

The MPG data in this series and this paper are raw data values, with no correction factors for road MPG correlation or "test procedure adjustment." Where only one MPG value is presented, it is 55/45 combined MPG. All vehicle weight data are based on inertia weight class (nominally curb weight plus 300 lbs). The light truck data in this paper include gross vehicle weights (GVW) up to 8,500 lbs.

Vehicle classification as to vehicle type, size class and manufacturer generally follows fuel economy label, Gas Mileage Guide and CAFE protocols; exceptions for model year 1990 are listed in Appendix A. In some passenger car tables, Large Sedans and Wagons are aggregated as "Large," Midsize Sedans and Wagons are aggregated as "Midsize," and "Small" includes everything else. For trucks, the larger Pickups, Vans and Utility Trucks are sometimes aggregated as "Large" trucks, and "Small" includes the smaller models. The truck classification scheme used in this paper is explained in Reference 14.

Appendix B lists the model year 1990 nameplates and their average MPG as of the data freeze date.

This paper includes an estimate of 0 to 60 mph acceleration time, calculated from horsepower and inertia weight, as in reference 22.

* Numbers in brackets denote references listed at the end of the text.

III. General Car and Truck Trends

Table 1 gives characteristics of passenger cars, light trucks, and all light-duty vehicles (cars and light trucks) for model years 1975 to 1990. Total sales in model year 1990 are projected to be 10.7 million cars and 4.5 million trucks.

Sales-weighted 55/45 fuel economy for cars improved nearly nine MPG between 1975 and 1981, but improved less than four MPG between 1981 and 1988, and decreased from 28.6 in 1988 to 27.8 this year. Other changes since 1988, consistent with this declining MPG trend, include increases in inertia weight, horsepower and engine size.

Similarly, light truck MPG improved about six MPG between 1975 and 1981, but only 1.5 MPG between 1981 and 1987 when it reached 21.6. Since then, 55/45 fuel economy for light trucks has declined to 21.0 this year.

Average inertia weight for cars dropped 1,000 lbs between 1975 and 1980, leveled off for a while, and has increased by nearly 140 lbs. since 1987. The light truck weight trend is similar.

Average engine size for cars and light trucks decreased considerably between 1975 and 1981; by more than 100 CID for cars and 64 CID for trucks. Between 1981 and 1988, automobile engines decreased another 21 CID, but have increased 3 CID since then. Truck engine CID decreased until 1987, but is now 21 CID larger.

Average engine horsepower reached a minimum for cars in 1981 and for trucks in 1983, and has risen consistently since. Power per CID has increased steadily and significantly over the entire period; while advantage could have been taken of this to reduce CID and improve fuel economy, the MPG improvement has been foregone in favor of increased vehicle power and performance.

More than 95 percent of both this year's cars and trucks will have fuel injected engines. Diesel engine usage peaked in 1981 for cars and a year later for trucks. On a percentage basis, more cars used Diesel engines in 1981 than use carbureted engines this year. Diesels have not been an important part of the light duty vehicle market for nearly a decade.

IV. Trends by Vehicle Size

Table 2 describes cars by EPA car class. Interior volume is undefined for model years 1975 and 1976, and also for the Two-Seater car class. A value of 50 cubic feet has been assigned to all Two-Seaters, a class which has never accounted for more than about three percent of car sales.

On a class-by-class basis, passenger car MPG has declined for seven of the nine classes since 1988. The two classes (Two-Seaters and Large Wagons) that have improved their MPG since 1988 have done so by only 0.1 MPG and account for about 3 percent of the cars built this year. Four classes (Subcompacts, Compacts, Midsize and Large sedans) have accounted for over 90 percent of the cars built the past three years. Average MPG for all four of these classes is lower this year than it was in 1988.

Table 3 give characteristics of Large, Midsize and Small cars. Since 1980, Large Sedans and Wagons have never accounted for more than 15 percent of the cars, compared to about 20 percent in 1978 and 1979. The market share of Midsize Cars and Wagons dropped from a peak of 36 percent in 1981 to about 22.5 percent in 1988, and has since increased.

Average MPG for all three car size groups has decreased since 1988. These MPG decreases have been accompanied by increases in weight for all three size groups, and faster 0 to 60 acceleration time.

Table 4 gives fuel economy, market fraction, CID and inertia weight for light-duty trucks by size class. In the late 1970s, Large Pickups typically accounted for nearly 60 percent of all light trucks; Large Vans 20 percent and Small Pickups 10 percent. Since then, the market share of Large Pickups has dropped to less than 30 percent. Small Pickups gained in popularity through 1983 when they accounted for 38 percent of all light trucks. Since then, their market share has dropped to about 15 percent while Small Vans and Utility Trucks have each increased their shares of the market.

Table 5 compares average interior volume, weight, and fuel economy for 1975 to 1990 passenger cars with what might have occurred had the size and weight mix of these vehicles remained what it was in 1978. A similar comparison for light trucks is presented in Table 6.

V. Trends by Market Segment

Table 7 shows major characteristics of the Domestic, European, and Asian car fleets for model years 1978-90. Table 8 presents similar data light trucks in Domestic and Import segments. As in previous papers, Import production volumes include vehicles assembled in the U.S. by foreign manufacturers.

The market share of European cars has remained at 5 to 7 percent. The Asian share of the car market, on the other hand, has increased from 14 percent in 1978 to nearly 40 percent this year. The sales fraction of Import trucks has ranged from 10 to 30 percent and is currently in the middle of this range.

Compared to 1989, Domestic cars built this year get lower MPG, are nearly 100 pounds heavier, have larger engines, and faster 0 to 60 acceleration time. Similarly, this year's Asian and European cars get lower MPG than then did in 1989, are heavier and have larger engines. European passenger car MPG peaked at nearly 30 MPG in 1981, primarily because Diesel engines were used in 36 percent of the European cars that year.

Between 1983 and 1988 Domestic fuel economy improved from 24.1 to 27.1 MPG, but during this same period Asian MPG remained between 32.0 and 32.9 MPG. Domestic and Asian MPG both peaked in 1988. Consistent with this declining trend in Domestic, European and Asian MPG are an increasing trend in weight and a trend towards faster 0 to 60 acceleration time.

Import truck fuel economy peaked in 1981 at 27.3 MPG when 15.9 percent of them had Diesel engines. Since then, Import truck MPG has decreased 3.0 MPG and inertia weight has increased nearly 600 pounds. Since 1978, Domestic light trucks improved 5.8 MPG, but almost all of this improvement occurred between 1978 and 1983. Since then, Domestic truck MPG and inertia weight have remained in a narrow range.

For the Domestic, Hp/CID has increased from 0.48 in 1978 to 0.72 this year. For the Europeans, Hp/CID dropped from a value of 0.76 in 1978 to 0.69 in 1981 (the peak year for European Diesel usage) and has since risen to 0.97. Similarly, Hp/CID for the Asians decreased from 0.78 in 1978 to 0.71 in 1981 and 1982 and has since increased to 0.97 in 1990.

Ton-miles per gallon, i.e. miles per gallon multiplied by inertia weight in tons, equates vehicle utility with its ability to move weight (its own plus payload). Ton-MPG for Domestic and Asian cars have increased and are nearly identical. Ton-MPG for European cars peaked in 1982 at 42.7, dropped to about 40 in 1986, and is now increasing.

Cubic feet miles per gallon associates vehicle utility with the ability to move interior volume, i.e. passengers and cargo. Interior volume of European cars has been constant, but European fuel economy has decreased the last few years, so European cubic feet MPG has decreased. For both the Domestic and the Asians, interior volume has been relatively constant the past few years, and thus their cubic feet MPG trend has followed their fuel economy trend.

VI. Conclusions

There is a declining trend in light duty vehicle fuel economy. Passenger car fuel economy has dropped from 28.6 MPG in 1988 to 27.8 this year. Similarly, light truck fuel economy has dropped from 21.6 MPG in 1987 to 21.0 this year. Factors which have contributed to this decline include increases in weight, horsepower, and engine size.

Table 1 - Characteristics of 1975 to 1990 Light Duty Vehicles

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Cars																
Sales(000)	8237	9722	11300	11175	10794	9443	8733	7819	8002	10675	10791	11015	10727	10673	10083	10699
Fraction	.806	.788	.800	.773	.778	.835	.827	.803	.777	.761	.746	.717	.722	.701	.692	.704
City FE	13.7	15.2	16.0	17.2	17.7	20.3	21.7	22.3	22.1	22.4	23.0	23.7	23.9	24.2	23.7	23.4
Hway FE	19.5	21.3	22.3	24.5	24.6	29.0	31.1	32.7	32.7	33.3	34.3	35.5	35.9	36.6	36.3	36.0
55/45 FE	15.8	17.5	18.3	19.9	20.3	23.5	25.1	26.0	25.9	26.3	27.0	27.9	28.1	28.6	28.1	27.8
H/C Ratio	1.428	1.402	1.393	1.415	1.391	1.425	1.430	1.465	1.469	1.476	1.489	1.494	1.498	1.508	1.527	1.533
Wt(Lbs)	4058	4059	3944	3588	3485	3101	3076	3054	3112	3099	3093	3041	3030	3051	3115	3171
Ton-MPG	32.3	35.5	36.4	35.9	35.4	36.6	38.9	40.1	40.7	41.1	41.9	42.6	42.8	43.8	43.8	44.2
Disp(CI)	288	287	279	251	238	188	182	175	182	179	177	167	162	161	164	164
Disp/Wt	.068	.068	.068	.067	.065	.058	.057	.055	.056	.056	.055	.053	.052	.051	.051	.050
% FWD	6.5	5.8	6.8	9.6	11.9	29.7	37.0	45.6	47.3	53.7	61.6	71.1	77.1	81.5	82.2	81.5
% 4WD					.3	.9	.7	.8	3.1	1.0	2.1	1.1	1.1	.9	.7	1.6
% Man.Tr	19.9	17.1	16.8	20.2	22.3	31.9	30.4	29.7	27.4	24.2	23.6	24.8	24.9	23.8	21.7	23.1
% Inject	5.1	3.2	4.2	5.1	4.7	6.9	8.8	17.0	28.3	39.4	53.5	65.1	73.0	84.2	89.4	96.0
% TBI						.7	2.6	9.8	18.9	24.4	32.0	28.4	30.5	30.2	27.6	20.8
% Port	5.1	3.2	4.2	5.1	4.7	6.2	6.1	7.2	9.5	15.0	21.4	36.7	42.5	54.0	61.8	75.2
% Carb	94.6	96.6	95.3	94.0	93.2	88.7	85.3	78.4	69.6	58.9	45.6	34.5	26.8	15.8	10.5	4.0
% Diesel	.2	.3	.5	.9	2.1	4.4	5.9	4.7	2.1	1.7	.9	.3	.3	.0	.0	.0
Eng-Hp	136	134	133	124	119	100	99	99	104	106	111	111	112	116	123	129
Hp/Disp	.515	.502	.516	.538	.545	.583	.594	.609	.615	.637	.671	.701	.732	.758	.786	.828
Hp/Wt	.033	.032	.033	.034	.034	.032	.032	.032	.033	.034	.035	.036	.037	.038	.039	.040
0 TO 60	14.2	14.4	14.0	13.7	13.8	14.3	14.4	14.4	14.0	13.8	13.3	13.2	13.0	12.8	12.4	12.1
% Small	55.4	55.4	51.9	44.7	43.7	54.4	51.5	56.5	53.1	57.4	55.7	59.5	63.5	64.6	59.8	59.1
% Mid	23.3	25.2	24.5	34.4	34.2	34.4	36.4	31.0	31.8	29.4	28.9	27.9	24.3	22.5	25.9	27.6
% Large	21.3	19.4	23.5	21.0	22.1	11.3	12.2	12.5	15.1	13.2	15.4	12.6	12.2	12.9	14.3	13.3
Trucks																
Sales(000)	1987	2612	2823	3273	3088	1863	1821	1914	2300	3345	3669	4350	4134	4559	4481	4501
Fraction	.194	.212	.200	.227	.222	.165	.173	.197	.223	.239	.254	.283	.278	.299	.308	.296
City FE	12.1	12.8	14.0	13.8	13.4	16.5	17.8	18.1	18.3	17.9	18.0	18.8	18.8	18.3	18.1	18.1
Hway FE	16.2	16.9	18.1	17.5	16.8	21.9	23.9	24.4	25.2	24.8	24.9	25.9	26.5	26.2	25.7	26.1
55/45 FE	13.7	14.4	15.6	15.2	14.7	18.6	20.1	20.5	20.9	20.5	20.6	21.4	21.6	21.2	20.9	21.0
H/C Ratio	1.360	1.336	1.307	1.287	1.268	1.338	1.348	1.355	1.381	1.387	1.390	1.386	1.412	1.429	1.427	1.442
Wt(Lbs)	4072	4155	4135	4151	4252	3869	3806	3806	3763	3782	3795	3738	3713	3841	3936	3952
Ton-MPG	28.4	30.5	33.0	32.4	32.1	36.3	38.8	39.6	39.9	39.3	39.6	40.4	40.4	40.9	41.3	41.8
Disp(CI)	311	319	318	314	298	248	247	243	231	224	224	211	210	227	233	233
Disp/Wt	.076	.076	.076	.075	.069	.062	.063	.062	.060	.058	.058	.055	.055	.058	.058	.058
% FWD						1.4	2.0	1.7	1.4	4.9	7.1	5.9	7.4	9.0	9.8	13.6
% 4WD	17.1	22.9	23.6	29.0	18.0	25.0	20.1	20.0	25.8	31.0	30.6	30.3	31.5	33.3	32.2	34.0
% Man.Tr	37.0	34.8	32.0	32.4	35.2	53.0	51.6	45.7	45.9	42.1	37.1	42.7	39.9	35.5	30.7	29.0
% Inject	.1	.1	.1	.1	.3	1.7	1.1	.7	.6	2.6	12.3	40.5	66.9	87.7	92.9	95.6
% TBI												18.7	33.6	44.4	45.8	38.2
% Port												21.8	33.3	43.3	47.1	57.4
% Carb	99.9	99.9	99.9	99.1	97.9	94.9	93.3	90.0	94.7	95.1	86.7	58.7	32.9	12.1	6.8	4.2
% Diesel				.8	1.8	3.5	5.6	9.3	4.7	2.3	1.1	.7	.3	.2	.2	.2
Eng-Hp	142	141	147	146	138	121	119	120	118	118	124	123	131	141	146	148
Hp/Disp	.476	.458	.482	.481	.486	.528	.508	.524	.543	.557	.586	.621	.654	.650	.653	.663
Hp/Wt	.035	.034	.036	.035	.032	.031	.031	.032	.031	.031	.033	.033	.035	.037	.037	.038
0 TO 60	13.6	13.8	13.3	13.4	14.3	14.5	14.6	14.5	14.5	14.7	14.2	14.0	13.3	12.9	12.8	12.7
% Small	13.7	11.1	13.5	13.3	18.5	30.3	27.6	33.9	45.5	46.0	50.5	56.8	61.8	57.3	54.8	53.9
% Large	86.3	88.9	86.5	86.7	81.5	69.7	72.4	66.1	54.5	54.0	49.5	43.2	38.2	42.7	45.2	46.1

Table 1 - Characteristics of 1975 to 1990 Light Duty Vehicles (Continued)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Cars and Trucks																
Sales(000)	10224	12334	14123	14448	13882	11306	10554	9732	10302	14020	14460	15365	14860	15232	14564	15200
City FE	13.4	14.6	15.6	16.3	16.5	19.6	20.9	21.3	21.2	21.2	21.5	22.1	22.2	22.1	21.6	21.6
Hway FE	18.7	20.2	21.3	22.5	22.3	27.5	29.5	30.7	30.6	30.8	31.3	32.2	32.6	32.7	32.2	32.4
55/45 FE	15.3	16.7	17.7	18.6	18.7	22.5	24.1	24.7	24.6	24.6	25.0	25.7	25.9	25.9	25.4	25.4
H/C Ratio	1.415	1.388	1.376	1.386	1.363	1.411	1.416	1.443	1.449	1.455	1.464	1.463	1.474	1.484	1.496	1.506
Wt(lbs)	4060	4079	3982	3715	3655	3228	3202	3202	3257	3262	3271	3238	3220	3288	3367	3402
Ton-MPG	31.6	34.4	35.7	35.1	34.7	36.6	38.9	40.0	40.5	40.7	41.4	42.0	42.1	42.9	43.1	43.5
Disp(CI)	293	294	287	266	252	198	193	188	193	190	189	180	175	181	186	185
Disp/Wt	.069	.069	.070	.069	.066	.059	.058	.056	.057	.056	.056	.054	.053	.053	.053	.053
% FWD	5.3	4.6	5.5	7.4	9.2	25.0	31.0	37.0	37.0	42.1	47.8	52.6	57.7	59.8	59.9	61.4
% 4WD	3.3	4.8	4.7	6.6	4.3	4.9	4.0	4.6	8.1	8.2	9.3	9.3	9.6	10.6	10.4	11.2
% Man.Tr	23.2	20.9	19.8	23.0	25.1	35.4	34.1	32.8	31.5	28.5	27.0	29.8	29.1	27.3	24.5	24.8
% Inject	4.1	2.5	3.4	3.9	3.7	6.0	7.5	13.8	22.1	30.6	43.0	58.2	71.3	85.3	90.5	95.9
% TBI								7.9	14.7	18.6	23.9	25.7	31.4	34.5	33.2	25.9
% Port								5.8	7.3	11.4	16.0	32.5	39.9	50.8	57.3	69.9
% Carb	95.7	97.3	96.2	95.2	94.2	89.7	86.7	80.6	75.2	67.6	56.1	41.4	28.5	14.7	9.4	4.1
% Diesel	.2	.2	.4	.9	2.0	4.3	5.9	5.6	2.7	1.8	.9	.4	.3	.1	.1	.1
Eng-Hp	137	135	136	129	124	104	102	103	107	109	114	114	118	124	130	135
Hp/Disp	.507	.493	.510	.525	.532	.574	.580	.593	.599	.618	.650	.678	.710	.726	.745	.779
Hp/Wt	.033	.033	.034	.034	.034	.032	.032	.032	.033	.033	.035	.035	.036	.037	.038	.039
0 TO 60	14.1	14.3	13.8	13.6	13.9	14.3	14.4	14.4	14.1	14.0	13.6	13.4	13.1	12.8	12.5	12.2

Table 2 - Fuel Economy, Market Fraction, CID, IW, 0 To 60, and Volume for 1975 to 1990 Cars by Size Class

	Two Seater	Mini Compact	Sub Compact	Compact	Midsize Sedan	Large Sedan	Small Wagon	Midsize Wagon	Large Wagon
1975	19.7	23.0	19.2	16.2	13.6	13.1	22.4	13.2	11.9
	.030	.114	.123	.230	.198	.189	.058	.035	.024
	173	128	207	288	353	410	128	361	410
1976	3016	2721	3243	3958	4630	5142	2834	4791	5453
	12.6	15.2	14.2	14.6	13.9	13.5	14.8	13.8	14.0
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1977	19.4	26.0	22.2	17.5	15.7	14.2	23.9	16.0	13.5
	.021	.094	.141	.263	.202	.173	.036	.050	.021
	187	125	181	289	343	410	136	315	416
1978	3032	2688	3033	4025	4558	5156	2902	4555	5444
	12.1	15.1	14.7	15.2	13.8	13.4	15.2	14.8	13.7
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1979	20.0	27.9	23.9	17.9	16.4	15.9	25.5	16.3	15.5
	.020	.081	.140	.245	.197	.205	.034	.048	.030
	183	116	174	291	332	366	134	297	365
1980	3062	2544	2966	4129	4474	4482	2801	4410	4713
	12.4	14.0	14.2	14.6	13.9	12.8	14.9	15.1	13.6
	50	79	91	107	113	128	108	144	163
1981	19.4	27.4	24.6	20.2	18.6	16.8	24.3	18.6	15.9
	.017	.081	.184	.133	.299	.183	.032	.045	.026
	187	120	159	236	292	357	134	258	354
1982	3079	2584	2842	3552	3820	4394	2805	3836	4664
	11.8	14.1	14.4	14.5	13.4	12.8	14.3	14.4	13.4
	50	79	90	105	113	128	108	140	162
1983	20.1	27.6	24.1	19.5	19.1	17.4	25.7	19.1	16.1
	.024	.040	.282	.062	.297	.196	.029	.045	.026
	180	113	155	246	272	339	123	249	333
1984	3026	2450	2847	3624	3710	4210	2711	3758	4467
	12.2	14.4	14.2	14.4	13.6	12.9	15.1	14.7	13.4
	50	80	90	105	113	130	105	140	163
1985	20.6	28.1	27.1	22.4	21.6	19.1	28.6	21.1	19.1
	.021	.041	.376	.073	.316	.102	.033	.027	.011
	180	116	128	186	229	314	113	228	324
1986	2954	2459	2640	3185	3362	4130	2591	3535	4423
	12.3	14.4	14.7	14.4	13.8	14.0	15.4	15.0	15.2
	50	83	90	106	113	131	108	140	161
1987	21.9	34.3	29.3	26.7	22.9	20.4	30.0	23.1	19.9
	.019	.026	.311	.112	.332	.109	.048	.031	.012
	202	92	124	142	220	304	108	193	313
1988	3005	2164	2604	2825	3346	4108	2531	3285	4394
	10.6	14.5	14.7	14.2	14.2	14.3	14.4	14.5	15.3
	50	83	90	104	114	131	111	136	161
1989	25.7	35.5	29.1	29.0	24.0	20.7	30.6	23.7	19.2
	.034	.023	.298	.162	.273	.106	.049	.036	.019
	147	95	133	128	211	292	109	205	306
1990	2726	2193	2657	2794	3321	4034	2580	3384	4396
	13.0	14.6	14.5	14.6	14.2	13.9	15.3	14.3	14.6
	50	83	92	103	114	131	112	136	161

Table 2 - Fuel Economy, Market Fraction, CID, IW, 0 To 60, and Volume for 1975 to 1990 Cars by Size Class (Continued)

	Two Seater	Mini Compact	Sub Compact	Compact	Midsize Sedan	Large Sedan	Small Wagon	Midsize Wagon	Large Wagon
1983	23.9 .017 146	35.7 .020 100	30.0 .246 136	28.8 .182 141	23.9 .284 212	20.2 .135 293	32.2 .066 105	24.4 .034 200	19.6 .016 307
	2756 11.8 50	2273 14.2 82	2688 14.0 93	2844 14.4 103	3316 13.8 114	4041 13.4 131	2565 15.3 108	3348 14.1 136	4380 14.1 162
1984	26.7 .033 174	25.6 .004 151	29.6 .238 140	29.7 .256 137	24.1 .260 210	20.5 .116 294	31.9 .043 107	25.0 .034 172	19.9 .017 305
	2886 12.1 50	2855 10.5 76	2737 13.5 93	2798 14.3 103	3318 13.6 114	4022 13.4 131	2620 15.2 116	3298 14.1 136	4371 13.9 162
1985	26.9 .031 158	36.0 .007 114	30.1 .202 136	29.8 .272 138	24.9 .258 205	22.3 .140 279	32.5 .046 107	25.0 .030 173	20.9 .014 305
	2826 11.7 50	2300 13.4 79	2734 13.4 94	2804 13.5 103	3319 13.3 114	3841 12.7 129	2579 15.2 118	3380 13.9 136	4354 13.2 162
1986	28.1 .028 166	30.7 .016 113	30.6 .216 136	29.8 .304 137	25.9 .242 194	23.9 .115 260	31.0 .032 113	26.0 .037 162	22.0 .011 304
	2916 11.7 50	2408 12.8 81	2764 13.4 95	2819 13.5 103	3241 13.0 114	3719 12.1 127	2648 14.7 118	3355 13.6 138	4381 13.9 161
1987	27.5 .026 167	30.7 .007 140	31.1 .195 128	29.8 .374 135	26.0 .210 189	23.9 .114 260	30.7 .034 116	25.6 .033 173	22.1 .008 304
	2920 11.5 50	2636 11.3 77	2728 13.7 93	2835 13.3 103	3247 12.7 114	3696 11.8 127	2795 14.2 120	3434 13.0 140	4348 14.0 162
1988	27.4 .019 171	31.1 .004 136	32.0 .195 124	29.9 .404 136	26.7 .198 183	24.2 .122 262	31.3 .024 113	26.2 .027 171	22.8 .007 304
	2940 11.2 50	2619 11.7 78	2681 13.4 93	2889 12.9 104	3293 12.3 113	3730 10.8 128	2757 13.7 119	3378 12.7 139	4349 12.9 162
1989	26.2 .013 199	26.7 .003 148	30.6 .192 132	29.9 .371 132	26.7 .235 182	24.0 .127 261	31.5 .018 115	25.5 .024 182	22.9 .016 306
	3083 10.1 50	2874 10.6 77	2796 12.6 93	2905 12.7 103	3295 12.2 118	3707 11.3 127	2772 13.2 117	3481 12.3 142	4385 14.1 162
1990	27.5 .024 159	26.2 .008 149	31.6 .245 121	28.9 .290 139	26.2 .251 187	23.6 .126 260	29.5 .023 122	25.7 .025 181	22.9 .007 306
	2976 10.0 50	3046 10.4 80	2759 12.5 94	2983 12.2 103	3449 11.9 114	3798 11.6 127	3051 12.9 122	3475 12.0 141	4360 14.0 161

Table 3 - Characteristics of 1978 to 1990 Small, Midsize and Large Cars

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Small													
Sales(000)	4991	4714	5135	4495	4421	4248	6128	6030	6551	6809	6896	6034	6326
Fraction	.447	.437	.544	.515	.565	.531	.574	.559	.595	.635	.646	.598	.591
City FE	20.3	20.5	22.8	25.1	25.2	25.7	25.4	25.8	25.9	25.9	26.2	25.8	25.7
Hway FE	28.3	28.5	32.0	34.7	36.1	36.9	36.9	37.4	37.5	37.6	38.1	37.7	37.5
55/45 FE	23.3	23.4	26.2	28.6	29.2	29.8	29.6	30.0	30.1	30.1	30.5	30.1	29.9
H/C Ratio	1.395	1.398	1.403	1.388	1.433	1.435	1.449	1.444	1.442	1.449	1.450	1.462	1.456
Wt(lbs)	3013	2921	2709	2637	2675	2713	2765	2756	2784	2801	2821	2870	2893
Ton-MPG	35.5	34.6	36.0	38.2	39.6	40.9	41.4	41.8	42.3	42.5	43.3	43.4	43.6
Disp(CI)	174	163	136	128	129	133	138	135	136	133	133	133	132
Disp/Wt	.055	.053	.049	.047	.047	.048	.049	.048	.048	.046	.046	.045	.045
% FWD	20.2	23.7	37.0	49.0	57.3	60.8	64.6	69.8	74.7	80.5	84.7	86.6	84.7
% Man.Tr	43.6	49.2	53.6	54.8	51.1	50.6	41.3	41.4	40.2	38.4	35.5	33.6	36.7
% TBI					6.1	16.2	21.1	26.5	25.8	29.8	34.5	32.8	26.1
% Port	10.1	8.9	10.5	11.4	12.3	17.0	23.8	26.4	35.1	36.8	45.4	52.7	68.7
% Carb	88.6	89.0	85.6	83.8	77.8	64.7	52.9	45.8	38.7	33.2	20.1	14.4	5.2
% Diesel	1.4	2.1	3.9	4.8	3.8	2.1	2.1	1.3	.4	.2	.0	.0	.1
Eng-Hp	99.2	96.6	85.5	84.7	85.7	89.0	94.2	98.6	99.8	101.1	105.3	111.2	116.7
Hp/Disp	.631	.644	.659	.687	.684	.695	.707	.745	.753	.776	.807	.853	.903
Hp/Wt	.033	.032	.031	.032	.032	.032	.034	.035	.035	.035	.037	.038	.040
0 TO 60	14.2	14.2	14.6	14.4	14.5	14.2	13.9	13.5	13.4	13.4	13.1	12.6	12.2
Midsize													
Sales(000)	3843	3693	3244	3175	2420	2544	3135	3103	3076	2612	2398	2610	2952
Fraction	.344	.342	.344	.364	.310	.318	.294	.288	.279	.243	.225	.259	.276
City FE	16.1	16.7	18.6	19.8	20.5	20.5	20.6	21.2	21.9	21.9	22.2	22.1	21.7
Hway FE	23.0	23.2	26.8	28.5	30.3	30.2	30.7	31.8	33.3	33.5	35.0	35.2	35.0
55/45 FE	18.6	19.1	21.6	23.0	24.0	24.0	24.2	24.9	25.9	25.9	26.6	26.6	26.1
H/C Ratio	1.426	1.383	1.442	1.446	1.484	1.477	1.488	1.506	1.526	1.531	1.578	1.593	1.619
Wt(lbs)	3822	3716	3376	3341	3329	3319	3315	3325	3256	3273	3303	3312	3451
Ton-MPG	35.6	35.7	36.6	38.5	40.2	40.0	40.3	41.6	42.3	42.6	44.1	44.1	45.2
Disp(CI)	288	269	228	218	211	211	205	201	190	186	182	182	186
Disp/Wt	.075	.072	.067	.064	.062	.063	.061	.060	.058	.056	.055	.055	.054
% FWD	1.2	4.5	27.8	32.5	42.8	47.1	56.8	63.1	72.5	78.2	87.2	85.5	85.1
% Man.Tr	2.2	2.4	8.0	6.2	2.6	1.7	1.5	1.6	2.8	1.9	3.8	6.1	5.0
% TBI			1.4	2.1	13.6	15.3	25.0	36.6	40.4	40.6	28.2	19.7	14.4
% Port	1.6	2.3	1.3	.7	.8	1.3	4.5	14.0	28.8	45.0	67.3	79.7	85.6
% Carb	98.4	96.1	94.5	93.1	81.5	81.6	69.3	49.0	30.6	14.0	4.5	.7	
% Diesel	.0	1.6	2.8	4.1	4.1	1.7	1.2	.4	.2	.4			.0
Eng-Hp	133.4	126.4	112.3	107.1	107.5	111.2	112.6	116.8	118.0	123.7	128.5	131.3	141.5
Hp/Disp	.467	.475	.510	.514	.532	.546	.571	.612	.650	.691	.721	.731	.769
Hp/Wt	.035	.034	.033	.032	.032	.033	.034	.035	.036	.038	.039	.040	.041
0 TO 60	13.5	13.8	13.9	14.3	14.2	13.9	13.7	13.3	13.1	12.7	12.4	12.2	11.9

Table 3 - Characteristics of 1978 to 1990 Small, Midsize and Large Cars (Continued)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	----	----	----	----	----	----	----	----	----	----	----	----	----
Large													
Sales	2341	2387	1064	1064	978	1209	1412	1657	1388	1306	1378	1439	1421
Fraction	.210	.221	.113	.122	.125	.151	.132	.154	.126	.122	.129	.143	.133
City FE	14.4	15.1	16.3	17.1	17.2	16.8	17.1	18.4	19.5	19.4	19.8	19.6	19.2
Hwy FE	20.7	20.9	24.1	26.6	26.7	26.4	26.8	29.7	32.4	32.6	33.0	32.7	32.6
55/45 FE	16.7	17.2	19.1	20.4	20.4	20.1	20.4	22.2	23.8	23.7	24.1	23.9	23.6
H/C Ratio	1.440	1.388	1.479	1.562	1.557	1.572	1.569	1.618	1.667	1.687	1.675	1.675	1.695
Wt(lbs)	4428	4240	4158	4137	4088	4077	4066	3886	3777	3740	3764	3782	3827
Ton-MPG	37.2	36.7	40.1	42.8	42.2	41.1	41.6	43.1	44.8	44.4	45.5	45.2	45.1
Disp(CI)	357	339	315	305	294	294	296	282	264	263	265	266	262
Disp/Wt	.080	.080	.076	.074	.072	.072	.073	.072	.070	.070	.070	.070	.068
% FWD	1.0							29.1	51.1	56.8	55.5	57.8	60.3
% Man.Tr									.6	.5	.4	.3	.1
% TBI			1.8	15.3	17.1	35.9	37.3	43.6	14.5	14.1	11.9	20.0	10.5
% Port	.1	.1						17.4	61.8	67.3	74.3	67.6	82.6
% Carb	98.5	96.8	86.2	68.4	72.8	61.5	61.8	38.8	23.8	18.6	13.8	12.5	6.9
% Diesel	1.4	3.1	12.0	16.3	10.1	2.7	.9	.3					
Eng-Hp	162.3	153.8	136.3	133.0	135.9	140.4	140.7	143.6	146.9	148.8	149.7	156.5	157.6
Hp/Disp	.457	.456	.438	.442	.466	.480	.478	.511	.569	.579	.581	.606	.617
Hp/Wt	.037	.036	.033	.032	.033	.034	.035	.037	.039	.040	.040	.042	.042
0 TO 60	12.9	13.0	14.2	14.4	14.0	13.5	13.4	12.8	12.2	12.0	12.0	11.6	11.7

Table 4 - Fuel Economy, Market Fraction, CID and Inertia Weight
for 1975 to 1990 Light-Duty Trucks by Size/Body Class

	Small Pickups	Large Pickups	Small Van	Large Van	Small Utility	Large Utility
1975	22.1	13.1	20.7	13.1	16.1	12.1
	.1093	.5667	.0005	.2292	.0269	.0674
	116	343	109	318	273	350
	2821	4241	3497	4198	2897	4724
1976	23.5	13.9	19.9	13.8	15.9	13.2
	.0871	.6276	.0006	.1915	.0229	.0703
	117	344	120	324	273	356
	2829	4301	3500	4202	2985	4745
1977	26.3	14.9	22.2	14.7	17.0	14.5
	.1086	.6090	.0008	.1814	.0257	.0745
	121	347	120	333	274	352
	2820	4319	3500	4256	3074	4632
1978	26.3	14.7	20.0	14.2	16.7	13.8
	.1037	.5889	.0008	.1902	.0285	.0878
	121	339	120	330	275	359
	2844	4326	3500	4253	3026	4676
1979	23.4	14.3	18.7	13.5	16.7	11.6
	.1486	.5660	.0027	.1529	.0339	.0959
	123	330	120	326	261	355
	2832	4486	3500	4560	3196	4975
1980	25.3	17.4	19.0	16.5	18.8	14.3
	.2625	.5083	.0084	.1213	.0325	.0670
	123	294	120	299	227	328
	2792	4227	3619	4404	3083	4810
1981	28.1	18.9	18.5	17.4	20.4	15.6
	.2468	.5439	.0062	.1283	.0234	.0513
	129	286	120	292	225	320
	2822	4069	3644	4357	3054	4734
1982	27.5	19.0	21.7	17.1	20.5	16.8
	.3091	.4438	.0078	.1545	.0222	.0626
	144	287	111	296	207	324
	2880	4151	3668	4376	2922	4855

Table 4 - Fuel Economy, Market Fraction, CID and Inertia Weight
for 1975 to 1990 Light-Duty Trucks by Size/Body Class (continued)

	Small Pickups	Large Pickups	Small Van	Large Van	Small Utility	Large Utility
1983	26.9	18.4	19.7	17.7	21.9	16.5
	.3805	.3280	.0062	.1599	.0680	.0574
	145	289	118	301	189	333
	2978	4197	3567	4445	3512	4905
1984	26.0	18.8	24.7	17.1	21.9	15.5
	.2707	.3402	.0649	.1371	.1247	.0622
	146	271	136	303	175	331
	3080	4048	3380	4402	3546	4910
1985	26.9	18.6	23.5	16.4	22.1	15.8
	.2415	.3248	.1206	.1124	.1429	.0577
	148	276	169	308	168	333
	2974	4139	3521	4462	3643	4945
1986	26.8	19.1	23.2	17.4	22.2	16.3
	.2881	.2940	.1494	.0906	.1309	.0470
	145	266	181	305	163	328
	3003	4133	3671	4537	3550	4955
1987	26.9	19.2	23.2	17.1	22.4	15.8
	.2679	.2513	.2101	.0964	.1396	.0346
	147	261	185	310	175	340
	3018	4068	3672	4599	3513	5093
1988	26.3	19.0	23.1	17.5	22.0	16.1
	.2290	.3102	.1762	.0721	.1674	.0449
	153	286	194	313	188	334
	3079	4223	3816	4632	3529	5093
1989	26.2	19.0	23.1	17.0	21.2	16.4
	.1885	.3256	.2035	.0852	.1558	.0414
	154	283	188	315	213	329
	3094	4271	3834	4666	3685	5070
1990	25.2	19.7	23.1	17.3	21.8	16.3
	.1431	.3567	.2348	.0651	.1607	.0397
	178	268	199	314	200	333
	3270	4138	3884	4700	3635	5191

Table 5 - Effect of Weight and Size Mix Changes
on Passenger Car Characteristics, 1975 to 1990

----- Using Each Year's Actual Mix -----						
Year	Vol	Weight	Displ	FE City	Hway	55/45
1975	---	4058.	288.	13.69	19.46	15.79
1976	---	4059.	287.	15.23	21.27	17.46
1977	110.	3944.	279.	15.99	22.25	18.31
1978	109.	3588.	251.	17.24	24.49	19.89
1979	109.	3485.	238.	17.70	24.60	20.25
1980	104.	3101.	188.	20.33	28.97	23.48
1981	106.	3076.	182.	21.72	31.08	25.13
1982	106.	3054.	175.	22.31	32.73	26.04
1983	109.	3112.	182.	22.14	32.66	25.89
1984	108.	3099.	179.	22.45	33.28	26.30
1985	108.	3093.	177.	22.95	34.30	26.96
1986	107.	3041.	167.	23.71	35.54	27.89
1987	107.	3030.	162.	23.86	35.86	28.09
1988	107.	3051.	161.	24.21	36.64	28.57
1989	109.	3115.	164.	23.68	36.25	28.06
1990	107.	3171.	164.	23.43	36.03	27.80
----- Using Constant Size Class Mix (1978) -----						
1975	---	4169.	301.	13.26	18.95	15.33
1976	---	4109.	292.	15.02	21.11	17.26
1977	109.	3922.	277.	16.06	22.43	18.41
1978	109.	3588.	251.	17.24	24.49	19.89
1979	109.	3508.	241.	17.61	24.45	20.15
1980	109.	3277.	209.	19.41	27.86	22.48
1981	109.	3177.	194.	21.14	30.60	24.56
1982	109.	3166.	189.	21.67	31.96	25.34
1983	109.	3182.	192.	21.63	32.03	25.33
1984	109.	3231.	195.	21.28	31.90	25.03
1985	109.	3153.	187.	22.52	33.93	26.54
1986	109.	3128.	180.	22.92	34.95	27.12
1987	109.	3147.	179.	22.94	35.09	27.17
1988	109.	3161.	177.	23.34	35.96	27.72
1989	109.	3210.	179.	22.76	35.35	27.10
1990	109.	3295.	179.	22.48	35.19	26.84
----- Using Constant Weight Class Mix (1978) -----						
1975	---	3588.	237.	15.36	21.59	17.65
1986	---	3588.	235.	16.91	23.48	19.35
1977	104.	3588.	238.	17.52	24.19	20.00
1978	109.	3588.	251.	17.24	24.49	19.89
1979	110.	3588.	250.	17.28	24.11	19.80
1980	113.	3588.	246.	17.91	25.69	20.74
1981	115.	3588.	241.	18.82	27.44	21.92
1982	117.	3588.	235.	19.01	28.17	22.27
1983	117.	3588.	233.	18.93	28.45	22.29
1984	117.	3588.	232.	19.06	28.69	22.45
1985	119.	3588.	231.	19.49	29.68	23.05
1986	118.	3588.	230.	19.83	30.43	23.52
1987	118.	3588.	228.	20.07	30.84	23.81
1988	116.	3588.	225.	20.67	31.89	24.56
1989	118.	3588.	221.	20.74	32.10	24.67
1990	113.	3588.	215.	20.74	32.18	24.69

Table 6 - Effect of Size and Weight Mix Changes on Light Duty Truck Characteristics, 1975 to 1990

----- Using Each Year's Actual Mix -----

Year	Weight	Displ	FE City	Hway	55/45
1975	4072.	311.	12.12	16.23	13.68
1976	4155.	319.	12.83	16.94	14.40
1977	4135.	318.	14.04	18.14	15.63
1978	4151.	314.	13.77	17.53	15.24
1979	4252.	298.	13.43	16.81	14.73
1980	3869.	248.	16.48	21.94	18.56
1981	3806.	247.	17.78	23.90	20.10
1982	3806.	243.	18.11	24.39	20.48
1983	3763.	231.	18.32	25.16	20.87
1984	3782.	224.	17.93	24.75	20.47
1985	3795.	224.	18.03	24.89	20.58
1986	3738.	211.	18.78	25.94	21.45
1987	3713.	210.	18.82	26.48	21.64
1988	3841.	227.	18.34	26.15	21.19
1989	3936.	233.	18.07	25.68	20.85
1990	3952.	233.	18.14	26.15	21.04

---- Using Constant Size Class Mix (1978) ----

1975	4089.	313.	12.08	16.17	13.63
1976	4131.	316.	12.91	17.07	14.50
1977	4143.	319.	14.01	18.10	15.59
1978	4151.	314.	13.77	17.53	15.24
1979	4334.	308.	13.19	16.46	14.45
1980	4130.	278.	15.51	20.61	17.46
1981	4023.	272.	16.73	22.45	18.90
1982	4088.	275.	16.83	22.60	19.02
1983	4160.	277.	16.52	22.55	18.78
1984	4077.	266.	16.45	22.54	18.73
1985	4136.	270.	16.28	22.18	18.50
1986	4148.	263.	16.78	22.90	19.07
1987	4134.	263.	16.66	23.06	19.03
1988	4238.	279.	16.48	23.35	19.00
1989	4277.	278.	16.43	23.30	18.94
1990	4233.	271.	16.66	24.02	19.32

--- Using Constant Weight Class Mix (1978) ---

1975	4151.	315.	11.87	15.69	13.33
1976	4151.	317.	12.82	16.91	14.38
1977	4151.	319.	14.00	18.07	15.58
1978	4151.	314.	13.77	17.53	15.24
1979	4151.	295.	13.77	17.39	15.15
1980	4151.	280.	15.48	20.59	17.43
1981	4151.	279.	16.32	21.88	18.43
1982	4151.	280.	16.67	22.36	18.83
1983	4151.	273.	16.67	22.84	18.98
1984	4151.	270.	16.28	22.50	18.60
1985	4151.	268.	16.42	22.61	18.73
1986	4151.	259.	16.96	23.43	19.37
1987	4151.	255.	16.90	23.66	19.39
1988	4151.	258.	17.17	24.44	19.82
1989	4151.	253.	17.36	24.72	20.04
1990	4151.	252.	17.42	25.08	20.19

Table 7 - Characteristics of 1978 to 1990 Domestic, European and Asian Passenger Cars

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Domestic													
Sales(000)	9084	8761	6820	6261	5506	5683	8102	7797	7517	6605	6614	6388	6017
Fraction	.813	.812	.722	.717	.704	.710	.759	.723	.682	.616	.620	.634	.562
City FE	16.2	16.8	18.9	20.2	20.8	20.5	21.3	21.8	22.4	22.4	22.6	22.4	21.9
Hwy FE	23.1	23.4	27.2	29.4	31.3	30.9	32.1	33.2	34.5	34.8	35.7	35.6	35.3
55/45 FE	18.7	19.3	21.9	23.5	24.5	24.1	25.1	25.8	26.6	26.7	27.1	26.9	26.4
H/C Ratio	1.421	1.388	1.440	1.461	1.510	1.508	1.501	1.525	1.541	1.557	1.574	1.588	1.612
Wt(lbs)	3828	3696	3323	3291	3247	3310	3233	3246	3199	3200	3245	3278	3371
Ton-MPG	36.0	35.7	36.5	38.7	40.0	40.2	40.8	41.9	42.6	42.7	44.1	44.1	44.6
Disp(CI)	284	268	218	210	200	208	197	199	191	189	189	191	196
Disp/Wt	.073	.071	.064	.062	.059	.061	.059	.059	.058	.058	.057	.057	.057
% FWD	4.6	6.3	23.4	32.4	42.9	42.4	51.3	60.0	68.2	74.3	79.0	80.3	81.3
% 4WD			.6	.3	.4	.6	.3	.0	.1	.1	.0	.3	.0
% Man.Tr	8.2	9.9	16.8	15.3	15.4	12.3	13.6	11.0	11.7	10.9	9.9	9.7	8.5
% TBI			.9	3.7	13.9	26.6	32.0	44.2	41.0	45.2	35.8	33.6	27.2
% Port	1.1	1.1	.2			.7	6.3	13.3	29.6	39.6	59.6	63.3	71.1
% Carb	98.6	97.3	95.7	91.3	82.4	71.5	60.7	42.3	29.2	15.1	4.5	3.1	1.6
% Diesel	.4	1.6	3.1	5.0	3.7	1.2	.9	.2	.1	.1			
Eng-Hp	133	128	109	106	106	111	110	117	117	121	126	131	136
Hp/Disp	.483	.501	.532	.549	.567	.565	.593	.625	.646	.666	.696	.710	.718
Hp/Wt	.035	.035	.033	.032	.032	.033	.034	.036	.036	.037	.039	.040	.040
0 TO 60	13.6	13.6	14.1	14.2	14.3	14.0	13.8	13.2	13.0	12.8	12.4	12.2	12.1
% Small	32.2	31.0	37.3	32.7	38.8	34.7	45.3	40.7	43.6	43.3	47.8	41.4	37.4
% Mid	42.1	41.8	47.1	50.3	43.4	44.1	37.2	38.0	38.1	37.1	31.6	36.2	40.0
% Large	25.8	27.2	15.6	17.0	17.8	21.3	17.4	21.3	18.3	19.6	20.6	22.4	22.6
Cu.Ft	114	114	110	113	112	115	111	113	112	112	112	113	113
Cu.Ft MPG	2185	2235	2448	2706	2800	2828	2857	2950	2998	3018	3069	3068	3016
Cu.Ft Ton MPG	4117	4088	4048	4408	4504	4612	4553	4734	4767	4802	4959	5015	5072
European													
Sales(000)	582	520	699	525	494	441	640	666	732	742	596	492	583
Fraction	.052	.048	.074	.060	.063	.055	.060	.062	.066	.069	.056	.049	.054
City FE	20.5	21.0	24.1	25.5	25.1	23.7	23.2	22.8	22.6	22.5	21.7	21.2	21.0
Hwy FE	30.1	30.4	34.8	36.0	34.3	33.0	32.8	32.3	32.2	31.8	31.4	30.9	31.6
55/45 FE	23.9	24.4	28.0	29.4	28.6	27.2	26.7	26.3	26.1	25.9	25.2	24.7	24.8
H/C Ratio	1.472	1.450	1.441	1.418	1.368	1.393	1.413	1.419	1.431	1.419	1.448	1.455	1.506
Wt(lbs)	2705	2783	2649	2765	2895	3041	2987	3070	3016	3028	3155	3213	3284
Ton-MPG	33.2	35.1	38.5	42.1	42.7	42.0	40.8	41.1	39.8	39.5	40.1	40.0	40.9
Disp(CI)	115	121	114	121	129	140	139	145	146	147	153	153	154
Disp/Wt	.042	.043	.043	.044	.044	.046	.046	.047	.047	.047	.048	.047	.046
% FWD	53.7	47.0	65.3	61.1	54.8	42.0	45.4	45.0	47.1	46.2	44.4	39.1	50.2
% 4WD						.1	.5	.6	1.2	1.4	1.0	2.6	1.4
% Man.Tr	68.6	69.1	75.2	68.7	61.2	53.5	51.0	46.4	47.1	48.8	40.0	36.2	33.0
% TBI											2.7	.0	
% Port	65.5	54.9	55.3	61.4	65.6	77.1	84.2	88.8	91.4	90.3	97.2	99.4	97.7
% Carb	22.9	27.5	15.5	2.2	6.3	3.5	2.2	.3	5.3	6.6		.1	1.5
% Diesel	11.5	17.6	29.2	36.4	28.1	19.4	13.6	10.9	3.3	3.1	.1	.5	.8
Eng-Hp	87	87	80	84	92	107	110	117	124	128	138	144	149
Hp/Disp	.758	.727	.702	.694	.718	.773	.798	.823	.857	.883	.906	.952	.971
Hp/Wt	.032	.031	.030	.030	.031	.035	.037	.038	.040	.041	.043	.044	.044
0 TO 60	14.7	15.1	15.4	15.2	14.8	13.5	13.0	12.8	12.2	11.9	11.5	11.3	11.2
% Small	96.2	93.4	95.4	95.0	93.8	90.5	81.6	79.5	76.4	78.4	71.0	72.2	61.8
% Mid	3.8	6.6	4.6	5.0	6.2	9.3	18.4	20.5	22.1	19.7	26.7	25.6	27.7
% Large						.1		.0	1.5	1.9	2.3	2.1	10.5
Cu.Ft	92	90	90	93	96	99	100	102	103	101	103	103	104
Cu.Ft MPG	2335	2354	2699	2928	2923	2785	2772	2818	2793	2696	2680	2628	2659
Cu.Ft Ton MPG	3084	3195	3498	3940	4144	4181	4086	4231	4128	4006	4154	4150	4285

Table 7 - Characteristics of Domestic, European and Asian Passenger Cars (Continued)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
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Asian													
Sales(000)	1510	1513	1924	1948	1819	1879	1933	2328	2765	3380	3462	3203	4099
Fraction	.135	.140	.204	.223	.233	.235	.181	.216	.251	.315	.324	.318	.383
City FE	25.3	23.4	25.5	27.5	27.6	28.7	28.5	28.1	28.8	27.9	28.5	27.3	26.6
Hway FE	34.3	32.4	34.7	36.5	37.2	39.4	39.9	39.2	40.0	39.2	39.8	38.7	37.9
55/45 FE	28.7	26.7	29.0	30.9	31.2	32.7	32.7	32.2	32.9	32.0	32.7	31.5	30.7
H/C Ratio	1.357	1.386	1.365	1.335	1.355	1.370	1.394	1.386	1.384	1.400	1.392	1.414	1.420
Wt(lbs)	2482	2506	2482	2469	2512	2529	2569	2585	2616	2700	2663	2773	2862
Ton-MPG	36.2	33.9	36.4	38.6	39.7	41.9	42.5	42.2	43.5	43.6	43.9	43.9	44.2
Disp(CI)	106	107	107	109	113	112	114	113	110	111	108	114	119
Disp/Wt	.042	.042	.043	.044	.044	.044	.044	.043	.042	.041	.040	.041	.041
% FWD	22.8	32.4	39.2	45.5	51.3	63.2	66.8	71.8	85.3	89.3	92.8	92.6	86.4
% 4WD		2.5	2.4	2.1	2.2	11.3	4.2	9.4	3.6	3.0	2.5	1.4	4.0
% Man.Tr	74.1	77.8	69.7	68.7	64.4	67.1	59.4	59.0	54.4	47.1	47.6	43.4	43.2
% TBI							.5	.4	1.7	8.5	24.1	19.8	14.2
% Port	5.9	8.1	9.4	11.0	13.1	20.2	28.6	29.5	41.4	37.6	35.9	53.2	78.0
% Carb	94.1	91.9	90.6	88.2	85.6	79.3	70.1	69.9	56.8	53.9	40.0	27.1	7.8
% Diesel				.8	1.3	.5	.8	.2	.1				
Eng-Hp	84	78	77	78	80	83	88	89	90	93	93	104	116
Hp/Disp	.784	.734	.720	.713	.707	.731	.768	.782	.810	.827	.852	.912	.970
Hp/Wt	.033	.031	.031	.031	.032	.032	.034	.034	.034	.034	.034	.037	.040
0 TO 60	14.0	14.6	14.6	14.5	14.5	14.2	13.7	13.9	13.8	13.9	13.6	12.8	12.2
% Small	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	98.1	99.6	95.7	94.7	90.7
% Mid								.8	1.9	.4	4.3	5.3	9.3
% Large													
Cu.Ft	85	85	89	89	91	93	94	95	97	97	98	102	98
Cu.Ft MPG	2531	2356	2647	2816	2924	3160	3174	3175	3287	3194	3296	3264	3069
Cu.Ft Ton MPG	3097	2895	3232	3426	3611	3924	4004	4013	4211	4236	4307	4476	4320
Fleet													
Sales(000)	11175	10794	9443	8733	7819	8002	10675	10791	11015	10727	10673	10083	10699
City FE	17.2	17.7	20.3	21.7	22.3	22.1	22.4	23.0	23.7	23.9	24.2	23.7	23.4
Hway FE	24.5	24.6	29.0	31.1	32.7	32.7	33.3	34.3	35.5	35.9	36.6	36.3	36.0
55/45 FE	19.9	20.3	23.5	25.1	26.0	25.9	26.3	27.0	27.9	28.1	28.6	28.1	27.8
H/C Ratio	1.415	1.391	1.425	1.430	1.465	1.469	1.476	1.489	1.494	1.498	1.508	1.527	1.533
Wt(lbs)	3588	3485	3101	3076	3054	3112	3099	3093	3041	3030	3051	3115	3171
Ton-MPG	35.9	35.4	36.6	38.9	40.1	40.7	41.1	41.9	42.6	42.8	43.8	43.8	44.2
Disp(CI)	251	238	188	182	175	182	179	177	167	162	161	164	164
Disp/Wt	.067	.065	.058	.057	.055	.056	.056	.055	.053	.052	.051	.051	.050
% FWD	9.6	11.9	29.7	37.0	45.6	47.3	53.7	61.6	71.1	77.1	81.5	82.2	81.5
% 4WD		.3	.9	.7	.8	3.1	1.0	2.1	1.1	1.1	.9	.7	1.6
% Man.Tr	20.2	22.3	31.9	30.4	29.7	27.4	24.2	23.6	24.8	24.9	23.8	21.7	23.1
% TBI			.7	2.6	9.8	18.9	24.4	32.0	28.4	30.5	30.2	27.6	20.8
% Port	5.1	4.7	6.2	6.1	7.2	9.5	15.0	21.4	36.7	42.5	54.0	61.8	75.2
% Carb	94.0	93.2	88.7	85.3	78.4	69.6	58.9	45.6	34.5	26.8	15.8	10.5	4.0
% Diesel	.9	2.1	4.4	5.9	4.7	2.1	1.7	.9	.3	.3	.0	.0	.0
Eng-Hp	124	119	100	99	99	104	106	111	111	112	116	123	129
Hp/Disp	.538	.545	.583	.594	.609	.615	.637	.671	.701	.732	.758	.786	.828
Hp/Wt	.034	.034	.032	.032	.032	.033	.034	.035	.036	.037	.038	.039	.040
0 TO 60	13.7	13.8	14.3	14.4	14.4	14.0	13.8	13.3	13.2	13.0	12.8	12.4	12.1
% Small	44.7	43.7	54.4	51.5	56.5	53.1	57.4	55.7	59.5	63.5	64.6	59.8	59.1
% Mid	34.4	34.2	34.4	36.4	31.0	31.8	29.4	28.9	27.9	24.3	22.5	25.9	27.6
% Large	21.0	22.1	11.3	12.2	12.5	15.1	13.2	15.4	12.6	12.2	12.9	14.3	13.3
Cu.Ft	109	109	104	106	106	109	108	108	107	107	107	109	107
Cu.Ft MPG	2240	2258	2507	2744	2836	2904	2910	2990	3057	3051	3121	3109	3017
Cu.Ft Ton MPG	3926	3878	3841	4161	4273	4426	4425	4548	4585	4569	4703	4801	4741

Table 8 - Characteristics of 1978 to 1990 Domestic and Imported Light Duty Trucks

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Domestic													
Sales(000)	2915	2616	1293	1310	1459	1806	2608	2938	3055	2988	3676	3588	3571
Fraction	.891	.847	.694	.720	.763	.785	.780	.801	.702	.723	.806	.801	.793
City FE	13.2	12.7	14.9	16.1	16.8	17.2	16.8	17.0	17.4	17.7	17.7	17.5	17.6
Hway FE	16.7	15.7	19.8	21.7	22.7	23.8	23.4	23.7	24.2	25.2	25.6	25.2	25.7
55/45 FE	14.5	13.8	16.8	18.2	19.0	19.6	19.2	19.5	19.9	20.4	20.5	20.3	20.5
H/C Ratio	1.279	1.247	1.331	1.348	1.363	1.393	1.405	1.408	1.399	1.430	1.450	1.445	1.463
Wt(lbs)	4305	4504	4323	4173	4078	3977	3990	3963	3993	3932	3985	4070	4081
Ton-MPG	31.8	31.8	36.8	38.4	39.3	39.6	38.9	39.2	40.1	40.5	41.2	41.7	42.1
Disp(CI)	337	330	303	293	277	257	250	245	243	237	247	253	254
Disp/Wt	.079	.073	.070	.070	.068	.063	.062	.061	.060	.059	.061	.061	.062
% FWD				.3	.0	.0	5.7	8.2	7.6	9.4	10.9	12.0	16.1
% 4WD	31.7	17.6	27.1	19.0	18.2	26.1	33.0	30.7	29.9	29.8	29.9	29.8	30.5
% Man.Tr	25.5	25.6	36.8	35.6	31.2	33.8	30.1	26.5	25.3	26.0	26.0	21.5	19.0
% Inject								9.5	44.6	79.2	96.0	98.3	98.6
% TBI									19.8	38.6	50.5	51.1	45.4
% Port									24.8	40.6	45.5	47.2	53.2
% Carb	99.1	97.9	95.9	98.4	93.3	95.9	98.1	89.6	54.8	20.6	3.7	1.4	1.2
% Diesel	.9	2.1	4.1	1.6	6.7	4.1	1.9	.9	.6	.3	.2	.3	.3
Eng-Hp	153	148	136	132	130	125	125	130	134	143	150	153	155
Hp/Disp	.451	.449	.451	.453	.486	.508	.523	.553	.579	.629	.630	.629	.629
Hp/Wt	.036	.033	.032	.032	.032	.031	.031	.033	.034	.036	.038	.038	.038
0 TO 60	13.2	14.2	14.4	14.4	14.3	14.5	14.6	14.2	13.8	13.0	12.7	12.6	12.5
% Small	2.7	3.8	4.3	3.3	18.1	33.8	39.3	44.0	46.3	53.6	52.2	49.5	51.5
% Large	97.3	96.2	95.7	96.7	81.9	66.2	60.7	56.0	53.7	46.4	47.8	50.5	48.5
Imports													
Sales	358	473	571	510	454	495	737	730	1296	1146	883	893	931
Fraction	.109	.153	.306	.280	.237	.215	.220	.199	.298	.277	.194	.199	.207
City FE	22.2	20.3	21.5	24.2	24.1	24.1	23.7	23.5	23.1	22.5	21.6	20.6	20.7
Hway FE	29.9	28.0	29.0	32.5	32.0	32.1	31.2	30.9	31.1	30.6	28.9	27.8	28.0
55/45 FE	25.1	23.1	24.3	27.3	27.1	27.1	26.6	26.3	26.1	25.6	24.4	23.3	23.4
H/C Ratio	1.346	1.382	1.352	1.347	1.329	1.338	1.325	1.318	1.353	1.363	1.341	1.353	1.358
Wt(lbs)	2903	2854	2839	2862	2932	2982	3045	3119	3136	3139	3245	3395	3454
Ton-MPG	37.2	33.7	35.1	39.9	40.6	41.0	40.9	41.4	41.2	40.3	39.6	39.8	40.7
Disp(CI)	127	124	124	130	135	137	134	139	138	139	146	154	154
Disp/Wt	.043	.043	.044	.045	.046	.046	.044	.045	.044	.044	.045	.045	.045
% FWD			4.6	6.5	7.1	6.2	2.0	2.4	1.8	2.3	1.3	1.1	3.8
% 4WD	6.5	20.1	20.3	22.8	26.1	24.6	23.9	30.0	31.2	35.9	47.5	41.5	47.1
% Man.Tr	88.6	88.1	89.8	92.8	92.2	90.2	84.5	79.8	83.5	76.3	74.9	67.8	67.3
% Inject	.8	1.8	5.4	4.0	2.8	3.0	11.6	23.5	30.9	34.9	53.1	71.1	84.2
% TBI									16.1	20.5	19.2	24.7	10.5
% Port									14.8	14.4	34.0	46.4	73.7
% Carb	99.2	98.2	92.6	80.1	79.5	90.3	84.6	74.9	68.0	64.9	46.9	28.9	15.8
% Diesel			2.0	15.9	17.7	6.8	3.8	1.6	1.1	.2			
Eng-Hp	89	85	87	84	87	92	91	100	99	99	106	114	121
Hp/Disp	.719	.688	.701	.650	.648	.672	.680	.719	.717	.718	.737	.747	.793
Hp/Wt	.031	.030	.031	.030	.030	.031	.030	.032	.032	.032	.033	.034	.035
0 TO 60	14.7	15.0	14.7	15.2	15.2	14.6	14.9	14.4	14.3	14.2	13.9	13.6	13.2
% Small	100.0	100.0	89.3	90.2	84.7	88.0	70.0	76.7	81.6	83.1	78.2	76.0	63.0
% Large			10.7	9.8	15.3	12.0	30.0	23.3	18.4	16.9	21.8	24.0	37.0

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Appendix A - Vehicle Classification Convention
1990 Light Duty Vehicles

<u>Manufacturer/Vehicles</u>	<u>Are Classified As:</u>
Chrysler Vehicles by Diamond Star	Asian
Chrysler Vehicles by Lamborghini	European
Chrysler Vehicles by Maserati	European
Chrysler Vehicles by Mitsubishi	Asian
Ford Vehicles by Mazda	Asian
General Motors Vehicles by Isuzu	Asian
General Motors Vehicles by Nummi	Asian
General Motors Vehicles by Suzuki	Asian
Dodge Monaco	European
Eagle Premier	European
Ford Festiva	Asian
Ford Probe (4 cylinder)	Asian
Ford Probe (6 cylinder)	Domestic
Pontiac LeMans	Asian
Cadillac Allante	Domestic
Lotus Espirit	European
Honda Sterling	Asian
Chrysler Colt 4wd Wagon	Small Wagon
Chrysler Colt Vista	Small Van
Mitsubishi Space Wagon	Small Van
Subaru 4wd Sedans and Wagons	Passenger Cars

Note: Classification of a vehicle as Domestic, European or Asian is based on the authors' judgment of where the majority of the engine and emission control system design and development work was done. It is meant to be a tracking system for technical parameters related to engine and emission control system design, not a tracking system for "domestic content," or a replacement for the Domestic/Import classification used in implementing fuel economy standards legislation.

Appendix B - Average Fuel Economy by Nameplate and Size Class, 1990 Vehicles

***** UNADJ	***** UNADJ	***** UNADJ
TWO SEATERS 55/45	MINICOMPACT SEDANS 55/45	SUBCOMPACT SEDANS 55/45
***** MPG	***** MPG	***** MPG
HONDA CIVIC CRX HF 58.1		GEO METRO XFI 65.4
		GEO METRO, LSI 50.5
		SUZUKI SWIFT 48.3
		FORD FESTIVA 41.6
		DAIHATSU CHARADE 41.5
		SUBARU JUSTY 40.7
		SUZUKI SWIFT GT 36.9
		HONDA CIVIC CRX 36.8
		TOYOTA TERCEL 36.7
		SUBARU JUSTY 4WD 36.6
		HONDA CIVIC 36.6
		HYUNDAI EXCEL 36.0
		MITSUBISHI PRECIS 36.0
		NISSAN SENTRA 35.6
		GEO STORM 35.3
		CHRYSLER COLT 35.0
		NISSAN SENTRA COUPE 34.3
		TOYOTA COROLLA 34.2
		MITSUBISHI MIRAGE 34.1
		YUGO GV/GVX/CABRIO 33.4
		GEO PRIZM 32.4
		CHRYSLER OMNI/HORIZON 32.2
		ISUZU IMPULSE 31.9
		NISSAN PULSAR NX 31.9
		VW/AUDI FOX 31.7
		TOYOTA CELICA CONVERTIBLE 31.5
		MAZDA MX-5 MIATA 31.4
ALFA ROMEO SPIDER 29.9	VW/AUDI CABRIOLET 30.9	TOYOTA CELICA 30.9
		CHRYSLER LASER 29.6
		SUBARU XT 29.5
		MITSUBISHI ECLIPSE 29.4
		HONDA INTEGRA 29.3
		GM SUNBIRD CONVERTIBLE 29.3
		VW/AUDI 80 28.9
		CHRYSLER TALON 27.7
		VW/AUDI CORRADO 27.4
		HONDA PRELUDE 27.3
		CHRYSLER DAYTONA 27.2
		SUBARU XT 4WD 26.2
		NISSAN 240SX 26.1
		CHRYSLER LEBARON CONVERTIBLE 25.9
		FORD MUSTANG 25.3
		SAAB 900 CONVERTIBLE 25.0
		GM REATTA 24.7
		NISSAN M30 24.4
		VW/AUDI 90 24.3
		LOTUS ESPRIT TURBO 24.2
		VW/AUDI 80 QUATTRO 24.1
		MERCEDES-BENZ 190E2.6 23.9
NISSAN 300ZX 23.7	PORSCHE 944 S2 23.6	NISSAN 300ZX 2+2 23.9
		CHRYSLER TC BY MASERATI 23.8
		BMW M3 23.7
		GM CAMARO, FIREB/TRANS AM 23.6
		BMW 325I CONVERTIBLE 23.4
		VW/AUDI COUPE, QUATTRO 23.3
		BMW 3251X, 325I/325IS 23.1
		TOYOTA SUPRA 23.0
GM CORVETTE 22.4	MAZDA RX-7 22.9	
		MERCEDES-BENZ 300CE 21.4
MERCEDES-BENZ 300SL 21.2	PORSCHE 911 CARRERA 4/2 21.2	
GM ALLANTE 20.7		
MASERATI SPYDER/KARIF 19.1	MASERATI 222E 19.4	
	PORSCHE 928 S4 19.2	
MERCEDES-BENZ 500SL 18.0		MASERATI 430 18.7
FERRARI 348 TB/TS 17.8		
JAGUAR XJ-S 17.0		JAGUAR XJ-S COUPE 17.5
FERRARI TESTAROSSA 13.4		FERRARI MONDIAL 16.4
		ROLLS-ROYCE CORN/BENT 13.3
		LAMBORGHINI COUNTACH 8.7

Appendix B - Nameplate Fuel Economy (continued)

***** UNADJ	***** UNADJ	***** UNADJ
COMPACT SEDANS 55/45	MIDSIZE SEDANS 55/45	LARGE SEDANS 55/45
***** MPG	***** MPG	***** MPG
ISUZU STYLUS 35.3		
GM LEMANS 35.0		
MERCEDES-BENZ 300D 2.5 TURBO . 34.3		
FORD ESCORT 34.1		
MAZDA 323/323 PROTEGE 34.0		
CHRYSLER SUMMIT 33.1		
GM SUNBIRD 31.6		
VW/AUDI GOLF/GTI, JETTA 31.5		
GM CAVALIER 30.6		
GM GRAND AM, CALAIS 30.0		
SUBARU LOYALE 29.5		
TOYOTA CAMRY 29.3		
GM SKYLARK 29.3		
	MAZDA 626/MX-6 29.2	
HONDA ACCORD 29.1		
SUBARU LOYALE 4WD 28.3		
VW/AUDI 16V GTI, JETTA GLI ... 28.2		
CHRYSLER SHADOW, SUNDANCE 28.1	GM CENTURY 28.1	
SUBARU LEGACY 28.0	GM CUTLASS CIERA 28.0	
MITSUBISHI GALANT 27.9	GM CORSICA 27.9	
FORD TEMPO/TOPAZ 27.9		
	MERCEDES-BENZ 350SDL TURBO ... 27.7	
NISSAN STANZA 27.5		
FORD PROBE 27.4	VW/AUDI PASSAT 27.4	
GM BERETTA 27.3	GM 6000 27.3	
SAAB 900 26.8	CHRYSLER ACCLAIM 26.8	
	GM G.PRIX, SUPREME, LUMINA ... 26.8	
	CHRYSLER SPIRIT 26.7	
	FORD TAURUS/SABLE 26.6	
	GM REGAL 26.4	
PEUGEOT 405 SEDAN 26.3		
CHRYSLER LEBARON 26.2		
SUBARU LOYALE TURBO, LEGACY 4W 26.1		
	CHRYSLER DYNASTY, LEBAR LANDAU 25.9	
VOLVO 240 25.7	CHRYSLER NEW YORKER 25.6	
	HYUNDAI SONATA 25.5	
	NISSAN MAXIMA 25.4	
	FORD COUGAR 25.2	GM 88, LESAB, ELEC, PARK AV .. 25.2
	VOLVO 740-760 25.2	
	GM RIVIERA 25.2	
		GM NINETY-EIGHT, BONNEVILLE .. 25.0
		FORD THUNDERBIRD 24.8
TOYOTA ES250 24.7		
FORD TEMPO/TOPAZ AWD 24.5		
		SAAB 9000 24.4
TOYOTA CRESSIDA 24.3		
	GM TROFEO/TORONADO 24.2	
MERCEDES-BENZ 300E 2.6 23.9		
		FORD CONTINENTAL 23.9
		CHRYSLER NEW YORKER 23.6
HONDA LEGEND 23.4	VW/AUDI 100 QUATTRO 23.5	
VOLVO 780 23.4	TOYOTA LS400 23.5	
BMW 525I 23.3	MAZDA 929 23.4	
		VOLVO 760 23.3
		FORD MARK VII 23.2
		VW/AUDI 200 QUATTRO, 100 23.2
MITSUBISHI SIGMA 23.0	VW/AUDI 200 23.0	FORD GRAND MARQUIS, TOWN CAR 23.2
STERLING 827 23.0	ASC GRAND PRIX 23.0	CHRYSLER PREMIER, MONACO 23.2
MERCEDES-BENZ 300E 22.7		
JAGUAR 22.5	GM ELDORADO, SEVILLE 22.5	
		GM FLEETWOOD/DEVILLE 22.5
		GM CAPRICE 22.4
NISSAN Q45 21.5		FORD LTD CROWN VICTORIA 22.1
BMW 535I 20.7	BMW 735 20.6	GM BROUGHAM 21.9
MERCEDES-BENZ 300SE 20.1	MERCEDES-BENZ 300SEL 20.1	MERCEDES-BENZ 300E 4MATIC 21.5
	MERCEDES-BENZ 420SEL 18.9	
	MASERATI 228 18.5	
	VW/AUDI V8 18.5	
MERCEDES-BENZ 560SEC 17.6		
	MERCEDES-BENZ 560SEL 17.2	
	BMW 750IL 16.7	
	ROLLS-ROYCE SIL SPIR/BENT 13.3	
	ROLLS-ROYCE BENTLEY TURBO 12.8	

Appendix B - Nameplate Fuel Economy (continued)

***** UNADJ	***** UNADJ	***** UNADJ
SMALL WAGONS 55/45	MIDSIZE WAGONS 55/45	LARGE WAGONS 55/45
***** MPG	***** MPG	***** MPG
HONDA CIVIC 36.6		
NISSAN SENTRA 34.2		
TOYOTA COROLLA 34.1		
FORD ESCORT 33.9		
MITSUBISHI MIRAGE 33.5		
CHRYSLER COLT 33.5		
VW/AUDI FOX 31.7		
CHRYSLER COLT 4WD 29.6		
GM CAVALIER 29.4		
TOYOTA COROLLA ALL-TRAC 29.2		
HONDA CIVIC 4WD 29.2		
SUBARU LOYALE 29.2		
TOYOTA CAMRY 28.4		
SUBARU LEGACY 28.0		
	VW/AUDI PASSAT 27.3	
	GM CENTURY 27.2	
	GM CUTLASS CRUISER 27.1	
	GM CELEBRITY 27.1	
	GM 6000 26.5	
SUBARU LOYALE 4WD 26.2		
SUBARU LEGACY 4WD 26.1		
	VOLVO 240 25.8	
	PEUGEOT 405 25.5	
	FORD SABLE V6 25.3	
	FORD TAURUS V6 25.3	
	VOLVO 740/760 24.6	
	VOLVO 240 DL/240 GL 24.3	
	VOLVO 760 23.9	
	FORD TAURUS 23.9	
	FORD SABLE 23.8	
		FORD GRAND MARQUIS 23.2
		FORD LTD CROWN VICTORIA 23.2
		VW/AUDI 200 QUATTRO 23.1
	PEUGEOT 505 23.0	
		GM CUSTOM CRUISER 22.8
		GM CAPRICE 22.8
		GM LESABRE/ELECTRA 22.8
		MERCEDES-BENZ 300TE 21.3
	MERCEDES-BENZ 300TE 4MATIC ... 20.8	

Appendix B - Nameplate Fuel Economy (continued)

***** UNADJ	***** UNADJ	***** UNADJ
SMALL PICKUPS 55/45	SMALL VANS 55/45	SMALL UTILITY 55/45
***** MPG	***** MPG	***** MPG
		SUZUKI SAMURAI CONVERT 33.5
		SUZUKI SAMURAI HARDTOP 33.5
		SUZUKI SIDEKICK 2WD 32.2
		SUZUKI SIDEKICK SOFT-TOP 31.2
		SUZUKI SIDEKICK HARDTOP 31.2
		GEO TRACKER CONVERT 30.6
		GEO TRACKER 4WD 30.6
		NISSAN HARDBODY 2WD 28.1
		DAIHATSU ROCKY 4WD 27.3
	CHRYSLER COLT VISTA 27.1	
TOYOTA TRUCK 2WD 26.7	MITSUBISHI SPACE WAGON 26.3	
	NISSAN AXCESS 25.8	
ISUZU PICKUP 2WD 25.7		
FORD RANGER PICKUP 2WD 25.0		
GM S10 PICKUP 2WD 25.0		
GM S15 PICKUP 2WD 24.8		
	CHRYSLER COLT VISTA 4WD 24.7	
MITSUBISHI TRUCK 2WD 24.6		
CHRYSLER RAM 50 2WD 24.5	CHRYSLER CARAVAN/RAM VAN 24.4	
	CHRYSLER VOYAGER 2WD 24.4	
	MITSUBISHI VAN 24.3	
	NISSAN AXCESS AWD 23.9	
	CHRYSLER TOWN & COUNTRY 23.7	
	GM LUMINA APV 23.5	
	MAZDA MPV 23.4	
	GM SILHOUETTE 2WD 23.4	
	GM TRANS SPORT 2WD 23.4	
		GM S10 BLAZER 2WD 23.0
		GM S15 JIMMY 2WD 23.0
		GM ASTRO 2WD (CARGO) 22.6
	GM SAFARI 2WD (CARGO) 22.6	
	FORD AEROSTAR VAN 2WD 22.6	
		ISUZU AMIGO 2WD 22.5
		FORD BRONCO II 2WD 22.4
		MITSUBISHI WAGON 22.3
FORD RANGER PICKUP 4WD 22.0	GM ASTRO AWD (CARGO) 22.0	
	GM SAFARI AWD (CARGO) 22.0	
	GM ASTRO 2WD (PASS) 21.9	
	GM SAFARI 2WD (PASS) 21.9	
		GM S15 JIMMY 4WD 21.8
		GM S10 BLAZER 4WD 21.8
		TOYOTA 4-RUNNER 2WD 21.7
		FORD BRONCO II 4WD 21.6
		NISSAN VAN (PASS) 21.4
		CHRYSLER CHEROKEE 2WD 21.3
	VOLKSWAGEN VANAGON 2WD 21.2	
	FORD AEROSTAR WAGON 21.0	
		CHRYSLER WRANGLER 4WD 21.0
		CHRYSLER CHEROKEE 4WD 20.9
		CHRYSLER WAGONEER 4WD 20.6
		ISUZU AMIGO 4WD 20.6
		TOYOTA 4-RUNNER 4WD 20.6
		GM SAFARI AWD (PASS) 20.4
	GM ASTRO AWD (PASS) 20.4	
	MAZDA MPV 4X4 20.4	
	FORD AEROSTAR VAN 4WD 20.2	
		CHRYSLER RAIDER 4WD 20.2
		MITSUBISHI MONTERO 20.2
		NISSAN PATHFINDER 2WD 19.9
		NISSAN PATHFINDER 4WD 19.4
		ISUZU TROOPER 19.3
		VOLKSWAGEN VANAGON SYNCRO 18.5

Appendix B - Nameplate Fuel Economy (continued)

***** UNADJ	***** UNADJ	***** UNADJ
LARGE PICKUPS 55/45	LARGE VANS 55/45	LARGE UTILITY 55/45
***** MPG	***** MPG	***** MPG
MAZDA B2200/B2600I 26.9		
TOYOTA TRUCK 2WD 26.1		
TOYOTA 1-TON TRUCK 2WD 24.5		
CHRYSLER COMANCHE PICKUP 23.2		
ISUZU PICKUP 2WD 1 TON 22.5		
CHRYSLER DAKOTA PICKUP 2WD ... 22.5		
TOYOTA TRUCK 4WD 22.4		
CHRYSLER POWER RAM 50 4WD 22.3		
MITSUBISHI TRUCK 4WD 22.2		
MAZDA B2600I 4X4 22.1		
NISSAN HARDBODY 4WD 21.9		
GRUMMAN-OLSON S10 CAB CHASSIS 21.8		
GM S10 PICKUP 4WD 21.7		
GM S15 PICKUP 4WD 21.7		
ISUZU PICKUP 4WD 20.6		
GM C1500 SIERRA 2WD 20.5		
GM C1500 PICKUP 2WD 20.0		
CHRYSLER DAKOTA PICKUP 4WD ... 19.9		
	GM G15/25 VANDURA 19.3	
	GM G10/20 VAN 2WD 19.3	
FORD F150 PICKUP 2WD 18.8		
GM C2500 SIERRA 2WD 17.6		
GM C2500 PICKUP 2WD 17.6	GM G10/20 SPORTVAN 17.6	GM R1500 SUBURBAN 17.6
FORD F150 PICKUP 4WD 17.6	GM G15/25 RALLY 2WD 17.6	
GM K1500 PICKUP 4WD 17.5		
GM K1500 SIERRA 4WD 17.5		
CHRYSLER D100/D150 PICKUP 17.5		
	CHRYSLER B150/B250 VAN 17.4	
	GM G35 RALLY 2WD 17.4	
	GM G30 SPORTVAN 2WD 17.4	
	GM G30 VAN 2WD 17.0	
	GM G35 VANDURA 2WD 17.0	
	FORD E150 ECONOLINE 16.8	GM V1500 BLAZER 4WD 16.8
		GM V1500 JIMMY 4WD 16.8
FORD F250 PICKUP 2WD 16.7	CHRYSLER B150/B250 WAGON 16.7	
GM K2500 SIERRA 4WD 16.6		
GM K2500 PICKUP 4WD 16.5		
	CHRYSLER B350 VAN 16.4	
		GM V1500 SUBURBAN 16.3
		RANGE ROVER 16.3
		CHRYSLER AD150 RAMCHARGER 16.3
		FORD BRONCO 4WD 16.2
		FORD E250 ECONOLINE 16.1
	FORD E150 CLUB WAGON 15.8	
FORD F250 PICKUP 4WD 15.6		TOYOTA LAND CRUISER 15.4
	CHRYSLER B350 WAGON 15.1	
CHRYSLER D250 PICKUP 2WD 15.0		
CHRYSLER W100/W150 PICKUP 15.0		
CHRYSLER DAKOTA CAB CHAS 15.0		CHRYSLER AW150 RAMCHARGER 14.4
CHRYSLER D250 CAB CHASSIS 14.0		
CHRYSLER W250 PICKUP 4WD 13.8		CHRYSLER GRAND WAGONEER 13.7
TOYOTA CAB/CHASSIS 2WD 13.5		

Appendix C - Characteristics of 1990 Passenger Cars by Size Class

	Passenger Cars						Station Wagons		
	Two Seater	Mini Compact	Sub Compact	Compact	Midsize	Large	Small	Midsize	Large
Domestic									
Sales(000)	37		476	1693	2181	1286	43	227	74
Fraction	.141		.181	.545	.814	.955	.176	.841	1.000
55/45 FE	22.7		25.9	29.4	26.5	23.6	31.1	25.9	22.9
Wt(lbs)	3531		3250	2926	3447	3812	2856	3467	4358
Ton-MPG	40.2		42.3	43.2	45.8	45.1	44.7	44.9	50.0
Disp(CI)	316		208	145	189	264	136	189	305
Disp/Wt	.090		.063	.049	.055	.069	.047	.055	.070
% FWD	31.7		38.9	98.9	89.5	61.9	100.0	100.0	.4
% 4WD					.0				
% Man.Tr	11.9		32.3	16.8	2.7		19.6		
% TBI			37.7	50.4	18.3	11.6	81.8	10.4	
% Port	100.0		62.3	49.6	81.7	84.9	18.2	89.6	28.3
% Carb						3.5			71.7
% Diesel									
Eng-Hp	238		146	112	138	159	99	140	143
Hp/Disp	.749		.712	.779	.738	.614	.737	.742	.468
Hp/Wt	.068		.044	.038	.040	.042	.035	.040	.033
0 TO 60	8.2		11.5	12.6	12.1	11.6	13.5	11.9	14.0
Cu.Ft	50		95	102	114	127	119	143	161
Cu.Ft MPG	1138		2513	3033	3037	3013	3746	3700	3691
Cu.Ft Ton MPG	2009		4025	4419	5220	5736	5335	6405	8037
European									
Sales(000)	20	22	122	194	118	61	2	43	
Fraction	.078	.239	.046	.063	.044	.045	.009	.159	
55/45 FE	19.2	25.3	26.1	26.4	22.8	23.3	31.7	24.9	
Wt(lbs)	4106	3165	2950	3122	3593	3500	2500	3519	
Ton-MPG	39.8	40.5	38.7	41.5	41.3	40.8	39.7	44.0	
Disp(CI)	250	164	132	143	172	176	109	139	
Disp/Wt	.060	.051	.044	.045	.047	.050	.044	.039	
% FWD	9.4	46.5	53.8	53.1	33.5	100.0	100.0	20.5	
% 4WD			4.3	.2	1.7			1.6	
% Man.Tr	25.7	77.3	63.8	39.3	6.7	3.2	100.0	10.3	
% TBI									
% Port	100.0	100.0	93.0	98.2	99.0	100.0	100.0	100.0	
% Carb			7.0						
% Diesel				1.8	1.0				
Eng-Hp	272	176	135	138	160	150	81	133	
Hp/Disp	1.127	1.048	1.014	.964	.961	.866	.743	.958	
Hp/Wt	.065	.054	.045	.043	.044	.043	.032	.038	
0 TO 60	8.2	9.9	11.2	11.3	11.2	11.2	13.8	12.7	
Cu.Ft	50	75	92	105	112	121	111	135	
Cu.Ft MPG	992	1999	2445	2848	2615	2822	3526	3364	
Cu.Ft Ton MPG	1992	3057	3544	4349	4628	4939	4408	5912	

Appendix C - Characteristics of 1990 Passenger Cars by Size Class (Continued)

	Passenger Cars					Station Wagons			
	Two Seater	Mini Compact	Sub Compact	Compact	Midsize	Large	Small	Midsize	Large
Asian									
Sales(000)	204	69	2027	1219	382		199		
Fraction	.782	.761	.772	.392	.142		.815		
55/45 FE	29.9	26.5	33.8	28.8	25.6		29.2		
Wt(lbs)	2764	3009	2632	3040	3412		3099		
Ton-MPG	42.3	40.0	44.7	43.9	43.7		45.3		
Disp(CI)	122	144	99	131	176		119		
Disp/Wt	.043	.048	.038	.043	.051		.038		
% FWD	29.5	8.3	94.5	95.3	74.7		57.6		
% 4WD			2.4	2.4			42.4		
% Man.Tr	85.1	49.4	52.4	27.8	20.4		43.3		
% TBI	10.6		21.9	6.3			20.5		
% Port	89.4	100.0	63.1	93.7	100.0		71.3		
% Carb			15.0				8.2		
% Diesel									
Eng-Hp	137	138	99	124	157		114		
Hp/Disp	1.106	.959	.991	.942	.883		.958		
Hp/Wt	.048	.046	.037	.041	.045		.037		
0 TO 60	10.6	10.6	12.8	11.8	11.0		12.7		
Cu.Ft	50	82	94	104	112		123		
Cu.Ft MPG	1583	2176	3247	3031	2898		3633		
Cu.Ft Ton MPG	2117	3275	4201	4559	4897		5573		
Fleet									
Sales(000)	261	90	2625	3106	2681	1347	244	271	74
55/45 FE	27.5	26.2	31.6	28.9	26.2	23.6	29.5	25.7	22.9
Wt(lbs)	2976	3046	2759	2983	3449	3798	3051	3475	4358
Ton-MPG	41.8	40.1	44.0	43.4	45.3	44.9	45.1	44.8	50.0
Disp(CI)	159	149	121	139	187	260	122	181	305
Disp/Wt	.051	.049	.042	.047	.054	.068	.040	.052	.070
% FWD	28.2	17.5	82.5	94.6	84.9	63.6	65.5	87.3	.4
% 4WD			2.1	1.0	.1		34.5	.3	
% Man.Tr	70.2	56.1	49.3	22.5	5.4	.1	39.7	1.6	
% TBI	8.3		23.7	29.9	14.9	11.0	31.1	8.7	
% Port	91.7	100.0	64.3	69.9	85.0	85.6	62.2	91.3	28.3
% Carb			11.9			3.3	6.7		71.7
% Diesel				.1	.0				
Eng-Hp	162	147	110	119	142	158	111	139	143
Hp/Disp	1.058	.980	.941	.855	.769	.625	.917	.777	.468
Hp/Wt	.052	.048	.039	.039	.041	.042	.036	.040	.033
0 TO 60	10.0	10.4	12.5	12.2	11.9	11.6	12.9	12.0	14.0
Cu.Ft	50	80	94	103	114	127	122	141	161
Cu.Ft MPG	1475	2134	3077	3021	2999	3005	3652	3647	3691
Cu.Ft Ton MPG	2092	3223	4139	4470	5148	5700	5520	6327	8037

Appendix D - Characteristics of 1990 Light Duty Trucks by Size Class

	Small Pickups	Large Pickups	Small Van	Large Van	Small Utility	Large Utility
Domestic						
Sales(000)	439	1288	932	293	467	167
Fraction	.682	.802	.881	1.000	.646	.936
55/45 FE	24.5	18.9	23.0	17.3	21.5	16.4
Wt(lbs)	3366	4325	3907	4700	3650	5239
Ton-MPG	41.6	41.3	45.0	40.9	39.3	43.3
Disp(CI)	191	296	205	314	229	339
Disp/Wt	.057	.068	.052	.067	.063	.065
% FWD			61.9			
% 4WD	13.2	36.5	8.4		81.0	69.0
% Man.Tr	52.6	22.0	2.4	.5	28.5	3.4
% TBI	38.5	53.8	38.9	49.8	34.9	61.6
% Port	61.5	45.8	61.1	50.0	58.3	29.9
% Carb					6.8	6.0
% Diesel		.4		.2		2.5
Eng-Hp	133	163	144	171	156	187
Hp/Disp	.702	.553	.709	.541	.691	.551
Hp/Wt	.039	.038	.037	.036	.043	.036
0 TO 60	12.2	12.6	12.9	13.1	11.4	13.2
Imports						
Sales	205	317	125		256	11
Fraction	.318	.198	.119		.354	.064
55/45 FE	26.7	23.4	23.6		22.5	15.8
Wt(lbs)	3066	3376	3713		3605	4500
Ton-MPG	41.0	39.7	43.9		40.6	35.5
Disp(CI)	149	151	152		146	241
Disp/Wt	.049	.045	.041		.040	.053
% FWD			28.0			
% 4WD		54.1	15.6		88.4	100.0
% Man.Tr	79.3	87.0	24.0		61.5	
% TBI			6.0		29.0	
% Port	87.1	63.8	94.0		68.7	100.0
% Carb	12.9	36.2			2.3	
% Diesel						
Eng-Hp	124	116	125		119	164
Hp/Disp	.829	.760	.821		.814	.682
Hp/Wt	.040	.034	.034		.033	.036
0 TO 60	11.8	13.4	13.8		13.9	12.9
Fleet						
Sales	644	1605	1057	293	723	179
55/45 FE	25.2	19.7	23.1	17.3	21.8	16.3
Wt(lbs)	3270	4138	3884	4700	3635	5191
Ton-MPG	41.4	40.9	44.9	40.9	39.8	42.8
Disp(CI)	178	268	199	314	200	333
Disp/Wt	.054	.064	.051	.067	.055	.064
% FWD			57.9			
% 4WD	9.0	40.0	9.2		83.6	71.0
% Man.Tr	61.1	34.9	5.0	.5	40.2	3.1
% TBI	26.3	43.2	35.0	49.8	32.8	57.6
% Port	69.6	49.4	65.0	50.0	62.0	34.4
% Carb	4.1	7.1			5.2	5.6
% Diesel		.3		.2		2.4
Eng-Hp	130	154	142	171	143	186
Hp/Disp	.743	.594	.723	.541	.734	.559
Hp/Wt	.040	.037	.037	.036	.039	.036
0 TO 60	12.0	12.8	13.0	13.1	12.3	13.2