

WHEELBASE MEASUREMENT SYSTEM

By

Corporal John R. Alstadt
Delaware State Police
Criminalistics Unit
New Castle, Delaware

A new idea in accident and criminal investigation was reintroduced to the law enforcement officer. Using this idea as a basis, I, with the assistance of the Delaware State Police Computer Analyst, have developed a theory whose range of data, I believe, is unique. The system, though relatively new, has been tested, proven reliable, and should be beneficial to the investigator.

The purpose of the following is to introduce the investigator to a system which may assist him or her in reaching a just conclusion in a traffic or criminal investigation. This system is not foolproof. However, when used in conjunction with other investigative tools, it can be invaluable.

The Wheelbase Measuring System deals with motor vehicles. With the advent of the motor vehicle, our society became more mobile. Commensurately, the criminal element within it has also come to rely on the motor vehicle. To prove this point, we ask, "How often have investigators arrived at the scene of a crime to find tire tracks leading to or away from the area?" Often, these tire impressions are the only physical evidence available for examination. It is the writer's contention that much like fingerprints, motor vehicles leave their own individual imprints which will enable law enforcement officers to categorize them by their class characteristics. By doing so, a limited range of motor vehicles can be developed from the vast auto population.

We do not pretend that this idea is unique. Indeed, two departments of which the writer is aware have had very successful results with similar systems. Our System; however, includes data which goes beyond the tire tracks of motor vehicles and in this sense is unique. When completed, information pertaining to most automobiles, vans and pick-up trucks, both foreign and domestic from 1971 to the present, will be available. The information includes:

- 1 - Wheelbase
- 2 - Front tire width
- 3 - Rear tire width
- 4 - Front bumper height
- 5 - Rear bumper height
- 6 - Front cowl (hood) height
- 7 - Vehicle length
- 8 - Vehicle width
- 9 - Curb weight

At this point it should be apparent that this System will not only assist the criminal investigator but also, the accident investigator.

So far, we have concerned ourselves with the System in general terms. Let us now look at the specifics and see how the System works. With the invaluable assistance of Sergeant James Dillon, Delaware State Police Crime Analysis Unit, a computer program was developed. By entering known data attained through investigation into the computer, the investigator can locate information which might assist him. The areas which the computer is capable of analyzing are:

- 1 - Inquiry on Wheelbase Measurement
- 2 - Inquiry on Front Tire Width Measurement
- 3 - Inquiry on Rear Tire Width Measurement
- 4 - Inquiry on Multiple measurements (Must have Wheelbase, Front Tire and Rear Tire Width)
- 5 - Inquiry on Front Bumper Measurement
- 6 - Inquiry on Vehicle Length Measurement
- 7 - Inquiry on Vehicle Width Measurement
- 8 - Inquiry on Vehicle Make/Year Span
- 9 - Inquiry on Make Alone
- 10 - Inquiry on Make/Model
- 11 - Inquiry on Front Tire Width and Rear Tire Width Measurement
- 12 - Inquiry on Curb Weight of Vehicle

(Addendum No. 1, depicts the computer search screen.) Certain areas listed contain general data which is specifically designed to assist the accident investigator. These areas are Numbers 6, 7, and 12. In addition, Numbers 8, 9, and 10 are included to assist both accident and criminal investigators in narrowing a search to specific years, makes, or models of a particular vehicle. The nucleus of the program; however, embodies Numbers 1 through 5 and 11, which deal directly with wheelbase, tire width and bumper height.

Before the reader continues, the areas involving measurements must be clearly defined. These areas are:

- 1 - Wheelbase
- 2 - Front and Rear Tire Width
- 3 - Bumper Height

The wheelbase is the area from the center of the front tire to the center of the rear tire on the same side of the vehicle. It is a very demanding measurement due to the fact that two points of reference in the tire track are needed. It is imperative that no measurement be taken unless these two points are present. If the exact point where the front and rear tires break parallel can be obtained, then the wheelbase measurement may be attained. (See Addendum No. 2)

The front and rear tire width measurements are relatively simple to obtain. By definition, the tire width is the measurement in distance from the center to center of the front and/or rear tires. When taking the front and rear measurements, the measurements should be taken from the following points. (See Addendum No. 3) The measurements should be taken from only straight tire patterns as curved patterns may cause erroneous results.

For both the wheelbase and the tire width, the direction of travel is necessary. A computer search can be made with one, two, or three of the aforementioned measurements. (Obviously, the more measurements supplied, the narrower the computer response will be.)

The bumper height is defined as the lowest point on the bumper to the ground. (See Addendum No. 2) Measurements for bumper heights are dependent on cooperation between the investigator and the Medical Examiner. The use of bumper heights, though not confined to a specific area, appears to have its greatest use in hit and run fatalities involving pedestrians. Precise measurements by the Medical Examiner are paramount to success. All measurements of this nature should include the height of the heels on the victim's shoes.

When analyzing the measurements attained for wheelbase or tire width, the investigator should allow for error. Common errors which may be encountered include investigator judgment, surface type and measuring device differences. A standardized margin of error must be incorporated into the computer search and strictly maintained. For all wheelbase and tire width measurements, the margin is .2 below and .2 above the known figure attained. EXAMPLE: If the width attained is 57.5, then the parameters would be 57.3 - 57.7.

For bumper height measurements, problems arise which the investigator cannot control. These include dip at the point of impact, front or rear wheel drive, and the integrity of the front end suspension. Due to this fact, parameters are less restricted. A figure of .75 is used for the low measurement and .25 for the high measurement. EXAMPLE: An officer attains information that the injuries plus shoe heel indicate a bumper height of 14.75. The variables would be 14.0 - 15.0.

The examples given in the previous two paragraphs were attained during the course of two investigations. The former was a criminal action while the latter was fatal (pedestrian) accident. Let us examine the cases and review the computer search for each.

During the course of the crime scene search at an alleged rape, tire impressions were noted. The impressions were photographed and then measured for tread width. The front tire width was used for the computer search as these impressions were the most accurate due to surface conditions. Actual measurement of the tire width was 57.5. Using the .2 margin of error, a set of parameters of 57.3 - 57.7 was established. (Addendum No. 4, is a copy of the computer print-out. One hundred and thirty-eight vehicles are listed.) The victim stated during the course of her interview that the suspect vehicle was a 1972 Plymouth Duster.

A fatal (pedestrian) accident, as stated previously, was the subject of the second search. Bumper height was established from measurements attained during the course of the victim's autopsy. The measurement from shoe heel to the point of injury was 14.75. Using the .75 and .25 margin of error, a search parameter of 14.0 - 15.0 was established. (Addendum No. 5, is a copy of the computer search which was conducted. A list of one hundred and four vehicles was

Attained.) The investigation revealed that the striking vehicle was a 1976 AMC Matador. (Note: Bumper measurements are unavailable for the 1976 AMC; however, the 1977 AMC Matador is the same as the 1976 in all respects.)

In both cases, the computer provided an added dimension to the investigation. It reduced the size of the auto population from over thirty-five hundred vehicles to a manageable size. A hand search, at this point, enabled the investigator to further reduce the list and increase the probability of a successful search.

In closing, it is pointed out that the figures used as parameters by the writer are arbitrary. The Wheelbase System is not an exact scientific method. At present, a success rate of approximately seventy-five percent has been attained and is considered acceptable. It is stressed that the standardization of search parameters be maintained regardless of the scope chosen. Bear in mind, the narrower the parameters, the more manageable the computer output will be. Finally, the Wheelbase System is only a tool to assist the investigator and as such should never be used solely to solve a crime.

BIBLIOGRAPHY

Given, Bruce E., and others. TIRE TRACKS AND TREAD MARKS. Houston: Gulf Publishing Company, 1977

"Identification of Vehicles From Wheelbase and Tire Stance Measurements." The IDENTIFICATION NEWS (June, 1984), pp. 5-6

PARKING DIMENSIONS. Detroit: Motor Vehicle Manufacturers Association, n.d.

PASSENGER CAR SPECIFICATIONS. Detroit: Motor Vehicle Manufacturers Associations, n.d.

=====

W H E E L B A S E / T I R E F I L E O P T I O N S

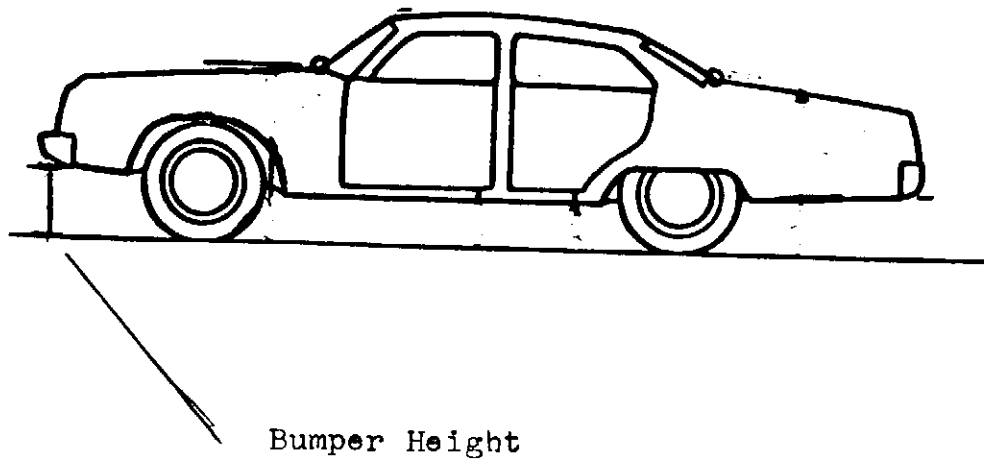
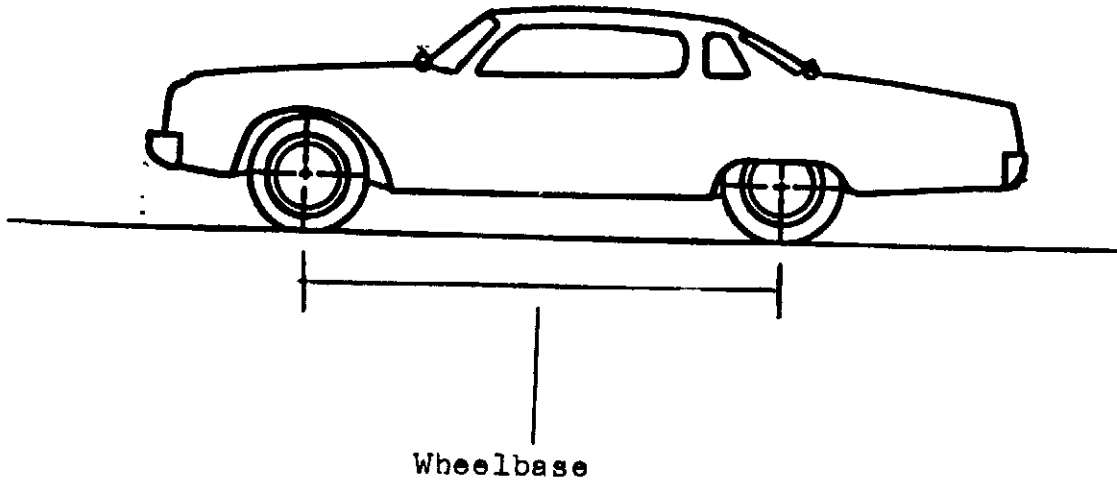
=====

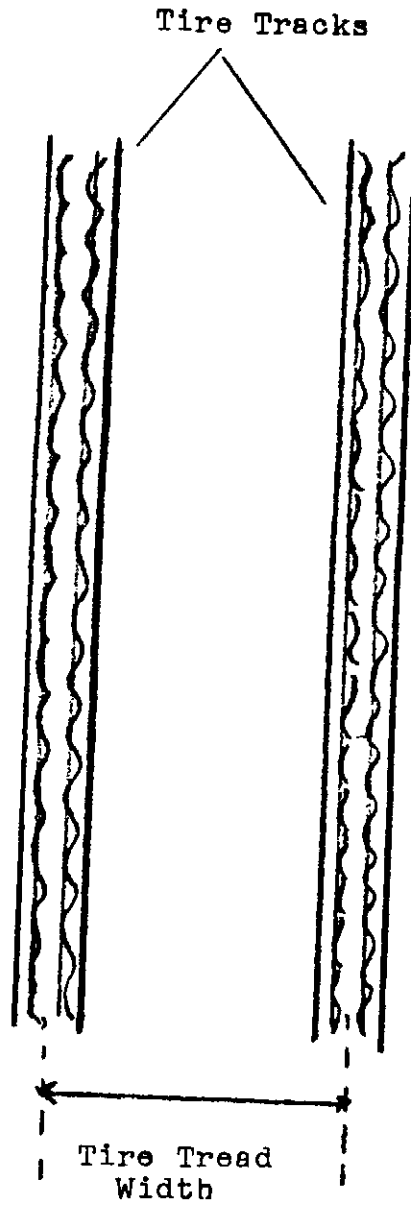
- (A) Adds Records To The File (ENTRY NOT PERMITTED)
 - (B) Edits Records In The File (ENTRY NOT PERMITTED)
 - (C) Inquiry on Wheelbase Measurements
 - (D) Inquiry on FTTS Measurements
 - (E) Inquiry on RTTS Measurements
 - (F) Inquiry on Multiple Measurements
 Must have (Wheelbase,FTTS,RTTS)
 - (G) Inquiry on Front Bumper Measurements
 - (H) Inquiry on Vehicle Length Measurements
 - (I) Inquiry on Vehicle Width Measurements
 - (J) Inquiry on Vehicle Make/Year Span
 - (K) Inquiry on Vehicle Make Alone
 - (L) Inquiry on Make/Model
 - (M) Inquiry on FTTS and RTTS Measurements
-
- (1) Reindex File
 - (R) Returns to Main Menu

=====

Press the Number or Letter Corresponding to Your Selection

=====





Minimum/Maximum FTTS: 57.3 / 57.7

PAGE NO. 00001
08/28/85

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COWL	Length	Width	Weight
AME	CONCORD	79	108.0	57.6	57.1	12.9	9.1	36.3	186.0	71.0	0
AME	CONCORD	81	108.0	57.5	57.0	12.1	8.7	35.6	187.2	71.1	0
AME	CONCORD	82	108.0	57.5	57.0	12.4	9.3	35.9	187.2	71.1	0
AME	CONCORD	83	108.0	57.6	57.1	12.8	8.4	36.1	187.3	72.0	0
AME	GREMLIN	71	96.0	57.4	57.0	0.0	0.0	0.0	161.3	70.6	0
AME	GREMLIN V6	76	96.0	57.5	57.1	0.0	0.0	0.0	169.4	70.1	0
AME	GREMLIN V8	76	96.0	57.5	57.1	0.0	0.0	0.0	169.4	70.1	0
AME	GREMLIN/6	72	96.0	57.5	57.0	0.0	0.0	0.0	161.3	70.6	0
AME	GREMLIN/6	73	96.0	57.5	57.0	0.0	0.0	0.0	165.5	70.6	0
AME	GREMLIN/6	74	96.0	57.5	57.0	0.0	0.0	0.0	170.3	70.6	0
AME	GREMLIN/6	75	96.0	57.5	57.0	0.0	0.0	0.0	170.3	70.6	0
AME	GREMLIN/V8	73	96.0	57.5	57.0	0.0	0.0	0.0	165.5	70.6	0
AME	GREMLIN/V8	74	96.0	57.5	57.0	0.0	0.0	0.0	170.3	70.6	0
AME	GREMLIN/V8	75	96.0	57.5	57.0	0.0	0.0	0.0	170.3	70.6	0
AME	HORNET V6	76	108.0	57.5	57.1	0.0	0.0	0.0	186.0	71.0	0
AME	HORNET V8	76	108.0	57.5	57.1	0.0	0.0	0.0	186.0	71.0	0
AME	HORNET/6	71	96.0	57.5	57.0	0.0	0.0	0.0	161.3	70.6	0
AME	HORNET/6	72	108.0	57.5	57.0	0.0	0.0	0.0	179.3	70.6	0
AME	HORNET/6	73	108.0	57.5	57.1	0.0	0.0	0.0	187.0	71.1	0
AME	HORNET/V8	75	108.0	57.5	57.1	0.0	0.0	0.0	187.0	71.1	0
AME	SPIRIT	80	96.0	57.5	57.0	13.9	9.5	36.9	169.2	71.9	0
AME	SPIRIT	81	96.0	57.5	57.0	13.9	9.5	36.9	169.2	71.8	0
AME	SPIRIT	82	96.0	57.5	57.0	13.9	9.5	36.9	169.2	71.9	0
AME	SPIRIT	83	96.0	57.6	57.1	14.0	9.4	37.0	169.2	72.0	0
BEN	BENTLEY F SERIES SEDAN	74	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.0	4634
BEN	BENTLEY T SERIES	71	119.5	57.5	57.5	0.0	0.0	0.0	203.5	71.0	4636
BEN	BENTLEY T SERIES SEDAN	73	119.5	57.5	57.5	0.0	0.0	0.0	203.5	71.0	4636
BEN	BENTLEY T SERIES SEDAN	72	119.5	57.5	57.5	0.0	0.0	0.0	203.5	71.0	4636
CHR	E CLASS	84	103.1	57.6	57.0	12.8	13.6	38.2	185.7	68.3	0
CHR	E CLASS	83	103.1	57.6	57.0	12.8	13.6	38.2	187.2	68.3	0
CHR	EXECUTIVE SEDAN	84	124.3	57.6	57.0	12.9	10.7	36.1	205.4	68.5	0
CHR	LASER	85	97.0	57.6	57.2	10.0	12.4	36.8	175.0	69.3	0
CHR	LEBARON	85	100.3	57.6	57.2	11.8	10.8	36.2	179.8	68.0	0
CHR	LEBARON	84	100.3	57.6	57.0	12.9	10.7	36.1	179.8	68.5	0
CHR	LEBARON	82	99.9	57.6	57.0	10.7	12.8	36.1	179.7	68.5	0
CHR	LEBARON	83	100.1	57.6	57.0	12.8	10.7	36.1	179.6	68.5	0
CHR	LEBARON/GTS	85	103.1	57.6	57.2	10.6	11.5	36.8	180.4	68.3	0
CHR	LIMOUSINE	85	131.3	57.6	57.2	13.0	12.2	36.6	210.8	68.0	0
CHR	NEW YORKER	85	103.3	57.6	57.2	12.5	11.4	36.0	185.1	68.0	0
CHR	NEW YORKER	84	103.1	57.6	57.0	12.9	13.6	38.2	187.4	68.3	0
CHR	NEW YORKER	83	103.1	57.6	57.0	12.8	13.6	38.2	187.2	68.3	0
DOD	400	82	99.9	57.6	57.0	12.8	10.7	36.1	179.7	68.5	0
DOD	600	85	100.3	57.6	57.2	11.8	10.8	36.2	179.8	68.0	0
DOD	600	83	103.1	57.6	57.0	12.9	13.6	38.2	185.6	68.3	0
DOD	600 SEDAN	84	100.3	57.6	57.0	12.9	10.7	36.1	179.8	68.5	0
DOD	600ES	83	103.1	57.6	57.0	12.9	13.6	38.2	185.6	68.3	0
DOD	AIRES	85	100.3	57.6	57.2	11.6	10.8	35.9	179.0	68.0	0
DOD	AIRES	83	100.1	57.6	57.0	13.1	10.3	35.9	176.2	68.6	0
DOD	ARIES	84	100.3	57.6	57.0	13.1	10.3	35.9	176.2	68.6	0
DOD	ARIES	81	99.6	57.6	57.0	12.2	10.1	35.9	176.0	68.0	0

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COWL	Length	Width	Weight
DOD	ARIES	82	99.9	57.6	57.0	13.1	10.3	35.9	176.0	68.6	0
DOD	CHALLENGER/6	72	110.0	57.7	61.5	0.0	0.0	0.0	191.3	76.3	0
DOD	DART DEMON/6	72	108.0	57.5	55.5	0.0	0.0	0.0	192.5	71.7	0
DOD	DART V8	72	111.0	57.4	55.6	0.0	0.0	0.0	196.2	69.6	0
DOD	DART/6	71	111.0	57.5	55.5	0.0	0.0	0.0	196.2	69.7	0
DOD	DART/6	72	111.0	57.4	55.6	0.0	0.0	0.0	196.2	69.6	0
DOD	DART/DEMON/6	71	108.0	57.5	55.5	0.0	0.0	0.0	192.5	71.6	0
DOD	DART/V8	71	111.0	57.5	55.5	0.0	0.0	0.0	196.2	69.7	0
DOD	DAYTONA	85	97.0	57.6	57.2	10.0	12.4	36.8	175.0	69.3	0
DOD	LANCER	85	103.1	57.6	57.2	10.6	11.5	36.8	180.4	68.3	0
FER	308 GTS	79	92.1	57.5	57.5	0.0	0.0	0.0	172.4	67.7	0
FER	308 GTS	78	92.1	57.5	57.5	0.0	0.0	0.0	172.4	67.7	0
FER	308GTB	79	92.1	57.5	57.5	0.0	0.0	0.0	172.4	67.7	0
FER	308GTB	78	92.1	57.5	57.5	0.0	0.0	0.0	172.4	67.7	0
FEU	505 SEDAN	84	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN	83	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN	82	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN	81	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN	80	107.9	57.5	56.4	0.0	0.0	0.0	186.6	68.3	0
FEU	505 SEDAN DIESEL	84	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN DIESEL	83	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN DIESEL	82	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN DIESEL	81	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 SEDAN DIESEL	80	107.9	57.5	56.4	0.0	0.0	0.0	186.6	68.3	0
FEU	505 TURBODIESEL	84	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 TURBODIESEL	83	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 TURBODIESEL	82	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 TURBODIESEL	81	107.9	57.5	56.5	0.0	0.0	0.0	186.7	68.4	0
FEU	505 TURBODIESEL	80	107.9	57.5	56.4	0.0	0.0	0.0	186.6	68.3	0
PLY	CARAVELLE	85	103.3	57.6	57.2	12.5	11.4	36.0	185.1	68.0	0
PLY	DUSTER	72	108.0	57.5	55.6	0.0	0.0	0.0	192.5	71.7	0
PLY	RELIANT	85	100.3	57.6	57.2	11.6	10.8	35.9	178.6	68.0	0
PLY	RELIANT	84	100.3	57.6	57.0	13.1	10.3	35.9	176.0	68.6	0
PLY	RELIANT	81	99.6	57.6	57.0	12.2	10.1	35.9	176.0	68.0	0
PLY	RELIANT	82	99.9	57.6	57.0	13.1	10.3	35.9	176.0	68.8	0
PLY	RELIANT	83	100.1	57.6	57.0	13.1	10.3	35.9	176.0	68.6	0
PLY	VALIANT SCAMP/V8	72	111.0	57.4	55.6	0.0	0.0	0.0	192.1	71.0	0
PLY	VALIANT/6	71	108.0	57.5	55.5	0.0	0.0	0.0	188.4	71.1	0
PLY	VALIANT/6	72	108.0	57.4	55.6	0.0	0.0	0.0	188.4	70.7	0
PLY	VALIANT/SCAMP/6	71	111.0	57.5	55.5	0.0	0.0	0.0	192.1	69.7	0
PLY	VALIANT/V8	71	108.0	57.5	55.5	0.0	0.0	0.0	188.4	71.1	0
PLY	VALIANT/V8	72	108.0	57.4	55.6	0.0	0.0	0.0	188.4	70.7	0
ROL	CORNICHE CONVERTIBLE	84	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	83	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	82	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	81	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	80	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	79	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	78	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE CONVERTIBLE	77	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	5305
ROL	CORNICHE CONVERTIBLE	76	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.7	5000

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COWL	Length	Width	Weight
ROL	CORNICHE CONVERTIBLE	74	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.0	4933
ROL	CORNICHE CONVERTIBLE	73	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.0	4700
ROL	CORNICHE CONVERTIBLE	72	119.5	57.5	57.5	0.0	0.0	0.0	203.5	72.0	4700
ROL	CORNICHE COUPE	81	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE COUPE	80	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE COUPE	79	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE COUPE	78	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	0
ROL	CORNICHE COUPE	77	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	4980
ROL	CORNICHE COUPE	76	119.0	57.5	57.5	0.0	0.0	0.0	207.5	72.7	5000
ROL	CORNICHE COUPE	74	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.0	4693
ROL	CORNICHE COUPE	73	119.5	57.5	57.5	0.0	0.0	0.0	207.5	72.0	4760
ROL	CORNICHE COUPE	72	119.5	57.5	57.5	0.0	0.0	0.0	203.5	72.0	4760
ROL	SILVER SHADOW	77	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.8	4980
ROL	SILVER SHADOW	76	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.8	4700
ROL	SILVER SHADOW II	80	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.8	0
ROL	SILVER SHADOW II	79	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.8	0
ROL	SILVER SHADOW II	78	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.8	0
ROL	SILVER SHADOW LONG W.B.	78	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.8	0
ROL	SILVER SHADOW LONG W.B.	77	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.8	5040
ROL	SILVER SHADOW LONG W.B.	76	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.8	4850
ROL	SILVER SHADOW LONG W.B.	74	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.0	4685
ROL	SILVER SHADOW LONG W.B.	73	123.5	57.5	57.5	0.0	0.0	0.0	207.5	71.0	4867
ROL	SILVER SHADOW LONG W.B.	72	123.5	57.5	57.5	0.0	0.0	0.0	207.5	71.0	4867
ROL	SILVER SHADOW SEDAN	74	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.0	4634
ROL	SILVER SHADOW SEDAN	73	119.5	57.5	57.5	0.0	0.0	0.0	207.5	71.0	4634
ROL	SILVER SHADOW SEDAN	72	119.5	57.5	57.5	0.0	0.0	0.0	203.5	71.0	4636
ROL	SILVER SHADOW SEDAN	71	119.5	57.5	57.5	0.0	0.0	0.0	203.5	71.0	4636
ROL	SILVER WRAITH II	80	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.8	0
ROL	SILVER WRAITH II	79	123.5	57.5	57.5	0.0	0.0	0.0	211.5	71.8	0
TOY	CAMRY 4 DR SEDAN	84	102.4	57.7	55.9	0.0	0.0	0.0	175.6	66.5	0
TOY	CAMRY 4 DR SEDAN	83	102.4	57.7	55.9	0.0	0.0	0.0	175.6	66.5	0
TOY	CAMRY 5 DR LIFTBACK	84	102.4	57.7	55.9	0.0	0.0	0.0	175.6	66.5	0
TOY	CAMRY 5 DR LIFTBACK	83	102.4	57.7	55.9	0.0	0.0	0.0	175.6	66.5	0
VLV	760 GLE SEDAN	84	109.1	57.5	57.5	0.0	0.0	0.0	188.4	68.9	0
VLV	760 GLE SEDAN	83	109.1	57.5	57.5	0.0	0.0	0.0	188.4	68.9	0
VLV	760 GLE SEDAN TURBO DIES	83	109.1	57.5	57.5	0.0	0.0	0.0	188.4	68.9	0
VLV	760 GLE SEDAN(TURBO DIES)	84	109.1	57.5	57.5	0.0	0.0	0.0	188.4	68.9	0
VLV	760 GLE TURBO	84	109.1	57.5	57.5	0.0	0.0	0.0	188.4	68.9	0

Front Bumper Measurement Inquiry

Minimum/Maximum Front Bumper Height: 14.0 / 15.0

PAGE NO. 00001
08/28/85

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COML	Length	Width	Weight
AMC	MATADOR/V8	77	118.0	58.1	60.6	14.3	10.4	39.5	216.5	77.3	0
AME	HORNET	77	108.0	57.9	57.1	14.0	7.8	35.7	186.1	71.0	0
AME	PACER	79	100.0	61.2	60.0	14.6	9.8	36.0	172.7	77.0	0
AME	PACER	79	100.0	61.2	60.0	14.9	10.2	36.0	177.7	77.0	0
AME	PACER WAGON/V8	78	100.0	61.4	60.0	14.6	9.9	36.0	177.0	77.0	0
AME	PACER/6	78	100.0	61.4	60.0	14.6	9.9	36.0	172.1	77.0	0
AME	SPIRIT	79	96.0	58.1	57.5	14.0	9.5	37.0	177.7	71.9	0
AME	SPIRIT	79	96.0	58.1	57.5	14.0	9.5	37.0	168.5	72.0	0
AME	SPIRIT	83	96.0	57.6	57.1	14.0	9.4	37.0	169.2	72.0	0
BUI	CENTURY	85	104.9	58.7	57.0	14.3	15.5	37.0	194.4	72.0	0
BUI	OPEL	79	94.3	51.4	51.4	14.5	12.4	34.3	168.0	61.8	0
BUI	RIVIERA	85	114.0	59.3	60.6	14.0	13.5	41.2	206.0	72.8	0
BUI	RIVIERA	84	114.0	59.3	60.6	14.0	13.5	41.2	206.6	72.8	0
BUI	SKYHAWK	85	101.2	55.5	55.2	14.6	15.0	37.2	177.9	66.6	0
BUI	SKYLARK	85	104.9	58.7	57.0	15.0	14.0	35.9	181.1	69.1	0
BUI	SKYLARK	83	101.2	55.4	55.2	14.5	13.7	38.2	175.3	66.3	0
BUI	SOMERSET REGAL	85	103.4	55.6	57.0	15.0	14.0	36.7	180.0	67.7	0
CAD	CIMARRON	85	101.2	55.5	55.2	14.6	15.0	37.2	177.9	66.6	0
CAD	DEVILLE	85	134.4	60.3	59.8	15.0	13.1	39.9	218.6	72.5	0
CAD	ELDORADO	85	114.0	59.3	60.6	14.0	13.5	41.2	206.0	72.8	0
CAD	ELDORADO	84	114.0	59.3	60.6	14.0	13.5	41.2	206.6	72.8	0
CAD	ELDORADO	83	114.0	59.3	60.6	14.0	13.5	39.9	206.6	72.8	0
CAD	FLEETWOOD	85	134.4	60.3	59.8	15.0	13.1	39.9	218.6	72.5	0
CAD	SEVILLE	85	114.0	59.3	60.6	14.0	13.5	41.2	206.0	72.8	0
CAD	SEVILLE	84	114.0	59.3	60.6	14.0	13.5	41.2	206.6	72.8	0
CHE	CAMARO	77	108.0	61.3	60.0	14.9	12.6	35.3	195.4	74.4	0
CHE	CAVALIER	85	101.2	55.5	55.2	14.6	15.0	37.2	177.9	66.6	0
CHE	CAVALIER	84	101.2	55.4	55.2	14.6	15.0	37.2	177.3	66.6	0
CHE	CELEBRITY	85	104.9	58.7	57.0	14.3	15.5	37.0	194.4	72.0	0
CHE	CELEBRITY	84	104.9	58.7	57.0	14.1	15.5	37.0	192.9	72.0	0
CHE	CITATION	85	104.9	58.7	57.0	15.0	14.0	35.9	181.1	69.1	0
CHE	CITATION	84	104.9	58.7	57.0	15.0	14.3	36.9	182.8	69.8	0
CHE	MONZA	77	97.0	54.8	53.6	14.8	13.5	35.1	179.3	65.4	0
CHR	5TH AVE	85	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
CHR	5TH AVENUE	84	112.7	60.0	59.5	14.3	11.2	37.1	206.0	74.2	0
CHR	5TH AVENUE	83	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
CHR	NEW YORKER	83	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
DOD	CHALLENGER	78	99.0	51.2	50.0	15.0	12.8	37.0	183.0	65.9	0
DOD	CHALLENGER	80	99.0	53.9	53.3	15.0	12.8	36.7	179.3	65.2	0
DOD	CHALLENGER	81	99.6	53.9	53.3	15.0	12.8	36.6	180.0	65.9	0
DOD	COLT	78	92.1	51.2	50.0	15.0	12.8	37.0	162.6	60.4	0
DOD	COLT COUPE	79	92.1	51.2	50.0	15.0	13.8	36.8	169.9	63.4	0
DOD	COLT SEDAN	79	92.1	51.2	50.0	15.0	13.8	36.8	169.9	63.4	0
DOD	COLT WAGON	80	99.0	53.9	53.3	15.0	12.8	36.7	179.3	65.2	0
DOD	DIPLOMAT	85	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
DOD	DIPLOMAT	84	112.7	60.0	59.5	14.3	11.2	37.1	206.0	74.2	0
DOD	DIPLOMAT	82	112.7	60.0	59.5	14.3	11.1	37.1	205.7	74.2	0
DOD	DIPLOMAT	83	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
FOR	ESCORT	85	94.2	54.7	56.0	14.2	12.0	36.0	163.9	65.9	0

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COWL	Length	Width	Weight
FOR	ESCORT	81	94.2	54.7	56.0	14.3	12.8	35.9	164.0	65.9	0
FOR	ESCORT	83	94.2	54.7	56.0	14.2	12.4	36.0	163.9	65.9	0
FOR	EXP	85	94.2	54.7	56.0	14.7	13.4	36.1	170.3	65.9	0
FOR	EXP	84	94.2	54.7	56.0	14.2	12.0	36.0	170.3	65.9	0
FOR	EXP	83	94.2	54.7	56.0	14.5	13.4	36.0	170.3	65.9	0
FOR	FIESTA	79	90.0	52.5	52.0	14.6	13.6	35.2	147.1	61.7	0
FOR	FIESTA	80	90.0	52.5	52.0	14.6	13.6	35.2	147.1	61.7	0
FOR	FORD	79	109.9	59.0	57.7	14.4	11.9	39.1	221.2	79.6	0
FOR	MUSTANG	77	96.2	55.6	55.8	14.4	12.6	36.4	175.0	70.2	0
FOR	MUSTANG	77	96.2	55.6	55.8	14.4	12.6	36.4	175.0	70.2	0
FOR	MUSTANG II/4	78	96.2	55.6	55.8	14.4	12.6	36.4	175.0	70.2	0
FOR	MUSTANG II/V8	78	96.2	55.6	55.8	14.4	12.6	36.4	175.0	70.2	0
FOR	TEMPO	85	99.9	54.7	57.6	14.9	12.7	36.6	176.2	68.3	0
FOR	THUNDERBIRD	82	108.4	58.1	57.0	14.0	12.9	37.4	200.4	74.1	0
LIN	CONTINENTAL	77	127.2	64.3	64.3	14.3	10.8	40.0	233.0	80.0	0
LIN	CONTINENTAL/MARK VII	85	108.5	58.4	59.0	14.9	14.9	39.1	202.8	70.9	0
LIN	CONTINENTAL/MARK VII	84	108.5	58.4	59.0	14.9	14.9	39.1	202.8	70.9	0
LIN	LINCOLN	79	127.2	64.3	64.3	14.4	11.0	40.2	233.0	79.9	0
MER	COUGAR/XR7	82	108.4	58.1	57.0	14.0	12.9	37.4	200.4	74.1	0
MER	LN7	83	94.2	54.7	56.0	14.5	13.4	36.0	170.3	65.9	0
MER	LYNX	85	94.2	54.7	56.0	14.2	12.0	36.0	163.9	65.9	0
MER	LYNX	84	94.2	54.7	56.0	14.2	12.0	36.0	163.9	65.9	0
MER	LYNX	81	94.2	54.7	56.0	14.3	12.8	35.9	164.0	65.9	0
MER	LYNX	83	94.2	54.7	56.0	14.2	12.4	36.0	163.9	65.9	0
MER	MERCURY	79	109.9	59.0	57.7	14.4	11.9	37.3	221.2	79.6	0
MER	TOPAZ	85	99.9	54.7	57.6	14.9	12.7	36.7	176.5	68.3	0
OLD	CALAIS	85	103.4	55.6	57.0	15.0	14.0	36.7	180.0	67.7	0
OLD	CUTLASS CIERA	85	104.9	58.7	57.0	14.3	15.5	37.0	194.4	72.0	0
OLD	FIRENZA	85	101.2	55.5	55.2	14.6	15.0	37.2	177.9	66.6	0
OLD	TORONADO	85	114.0	59.3	60.6	14.0	13.5	41.2	206.0	72.8	0
OLD	TORONADO	84	114.0	59.3	60.6	14.0	13.5	41.2	206.6	72.8	0
OLD	TORONADO	83	114.0	59.3	60.6	14.0	13.5	39.9	206.6	72.8	0
PLY	ARROW	79	92.1	51.2	50.0	14.4	13.0	35.6	162.6	60.4	0
PLY	ARROW	80	92.1	51.2	50.0	14.4	13.0	35.6	169.9	63.4	0
PLY	GRAN FURY	85	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
PLY	GRAN FURY	84	112.7	60.0	59.5	14.3	11.2	37.1	206.0	74.2	0
PLY	GRAN FURY	82	112.7	60.0	59.5	14.3	11.1	37.1	205.7	74.2	0
PLY	GRAN FURY	83	112.7	60.0	59.5	14.3	11.2	37.1	205.7	74.2	0
PLY	SAPPORO	79	99.0	53.9	53.3	15.0	12.8	36.6	179.3	65.2	0
PLY	SAPPORO	80	99.0	53.9	53.3	15.0	12.8	36.6	179.3	65.2	0
PLY	SAPPORO	81	99.6	53.9	53.3	15.0	12.8	36.6	180.0	65.9	0
PON	6000	85	104.9	58.7	57.0	14.3	15.5	37.0	194.4	72.0	0
PON	6000	84	104.9	58.7	57.0	14.1	15.5	37.0	192.9	72.0	0
PON	ASTRE	77	97.0	55.2	54.1	14.2	13.2	35.3	177.6	65.4	0
PON	GRAND AM	85	103.4	55.6	57.0	15.0	14.0	36.7	180.0	67.7	0
PON	PHOENIX	84	104.9	58.7	57.0	15.0	14.3	36.9	182.8	69.8	0
PON	SUNBIRD	85	101.2	55.5	55.2	14.6	15.0	37.2	177.9	66.6	0
PON	SUNBIRD	77	97.0	55.2	54.1	14.2	13.2	35.3	177.6	65.4	0
PON	SUNBIRD	84	101.2	55.4	55.2	14.6	15.0	37.2	177.3	66.6	0
PON	SUNBIRD HATCHBACK/V8	76	97.0	55.3	54.1	14.1	13.2	35.0	179.3	65.4	0

PAGE NO. 00003

08/28/85

Requested Information Follows

Make	Model	Yr	Wheelbase	Front Stance	Rear Stance	Front Bumper	Rear Bumper	COWL	Length	Width	Height
PON	SUNBIRD NOTCHBACK/4	78	97.0	55.3	54.1	14.1	13.2	35.0	177.8	65.4	0
PON	SUNBIRD WAGON/V6	78	97.0	55.3	54.1	14.1	13.2	35.0	177.6	65.4	0
VOL	RABBIT	80	94.4	54.7	53.5	14.3	14.7	35.6	154.5	63.4	0
VOL	RABBIT	81	94.5	54.5	53.5	14.0	10.8	34.7	155.3	63.4	0