U.S. Department of Justice
National Institute of Justice

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TAP

TECHNOLOGY ASSESSMENT PROGRAM

1987 Model Year Patrol Vehicle Testing

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PREFACE

We are very happy to have the opportunity to share with you the results of our evaluation of the new model "police patrol package" vehicles. The testing of the 1987 models represents our 11th year. Our goal has been to offer information that went beyond the "nice to know," but was practical and useful. We trust the data we have generated and made available over these 11 years has met that goal, and has been valuable to you in making your patrol vehicle purchasing decisions.

Many changes have occurred since the inception of the evaluation program. There have been significant advances over the years in brake, tire, and suspension technology which have resulted in improved overall pursuit capability, even though horsepower losses have resulted in reduced acceleration and top speed capabilities compared to 11 years ago. Also, when we started the program, we tested only 3 or 4 cars per year, while for the past several years we have tested all of the various "police package" vehicles offered by the American manufacturers. And finally, partially as a result of the above changes, we have had to alter our approach to our data collection methods, as well as to our preparation of the information for publication and distribution. Some of the changes will be obvious to you, and others will not, but we hope to continue to improve the report in future years.

As we have indicated in past years, if you intend to use the test data found in this report to assist you in your purchasing decision, we would urge you to first objectively evaluate the needs of your agency. Because acceleration from 0 - 100 mph is of great importance in our operation, doesn't necessarily mean that it is, or should be, in yours. Possibly 0 - 60 mph acceleration is more critical in effectively getting the job done in your locale. If used properly, the information contained in this report will help you to identify the car best suited to your needs.

In last year's test report, we noted the brakes on all four of the larger cars (Chevrolet Caprice, Dodge Diplomat, Ford Crown Victoria, and Plymouth Gran Fury) exhibited a tendency toward early rear wheel lockup on the impending skid stops. In this year's test, it was apparent all of the manufacturers had concentrated some effort in this area. The Chrysler and Ford products exhibited no such tendencies, and the Chevrolet showed only a slight tendency to lockup the rear brakes earlier than the front brakes, but not enough to present any problem.

We also noted last year that the brakes on the Ford Mustang were not well matched to the acceleration/top speed potential of the car. Ford has engineered a new (and much improved) brake package for the 1987 models, and they performed much better than last years during the Vehicle Dynamics portion of the evaluation, showing very little tendency to fade. They did not fare quite as well in the Brake Testing portion, as they exhibited a tendency toward premature rear lockup on the impending skid stops. This resulted in relatively low deceleration rate numbers for both Mustangs tested.

The Dodge Diplomat (318 [5.2L] 4BBL) failed to meet our established minimum acceleration requirements, and was consequently eliminated from our bid process. We did continue to evaluate the car in order to provide the data to other law enforcement agencies whose requirements for acceleration and/or top speed differ from ours.

In a preliminary letter sent to many agencies we indicated that a Ford Taurus would be tested. Prior to the testing, however, Ford Motor Company decided not to offer the Taurus in "police package" configuration for the 1987 model year and, consequently, withdrew the car from testing. We have been told it will be available for the 1988 model year.

We have received many inquiries regarding the proper inflation of the tires used on the patrol cars both during the evaluation procedure, and in normal patrol service. Upon the recommendation of Goodyear Tire and Rubber Company, our tires are kept at 35 psi cold inflation for both testing and patrol.

At the back of this report, you will find a listing of the people representing various agencies outside Michigan who came here to observe the vehicle evaluation. It is possible someone from your state or local area was in attendance. If you would like an independent observer's assessment of the evaluation process, we're sure any of the people listed would be willing to discuss with you what they observed.

We would like to extend our most sincere thanks to the National Institute of Justice (NIJ), who, through the Technology Assessment Program, provides assistance and monetary support for the continuation of the evaluation program. We are also most appreciative of the support of the vehicle manufacturers--Ford Motor Company, Chrysler Corporation, and the Chevrolet Division of General Motors, for the coordination and engineering efforts that are required to prepare and supply us with test cars.

Finally, we would like to thank the many people who represent law enforcement and purchasing agencies throughout the United States and Canada for their continued encouragement and support. We genuinely enjoy this opportunity to make a contribution to the law enforcement field, and hope we can continue to be responsive to your needs.

As always, if anything in this report requires further explanation or clarification, or if we can be of some other service to you, please feel free to contact us by phone or by mail.

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ABOUT THE TECHNOLOGY ASSESSMENT PROGRAM

The Technology Assessment Program (TAP) is an applied research project of the National Institute of Justice. TAP assists the Law Enforcement Standards Laboratory (LESL) of the National Bureau of Standards in establishing research priorities that are based on user needs.

TAP contracts with LESL-certified labs to conduct tests of criminal justice equipment in accordance wth LESL-developed performance standards. TAP then compiles the test results and disseminates the findings to criminal justice agencies.

TAP has four major tasks and goals:

Coordination of the Technology Assessment Program Advisory Council. Composed of nationally recognized practitioners, the Advisory Council gives directions for future standards and tests. TAP serves as the liaison between the Advisory Council, NIJ, and LESL.

Coordination of equipment testing. TAP develops RFP's to select testing subcontractors, evaluates proposals, coordinates the acquisition of equipment and actual testing, and together with NIJ and LESL ensures that the data are accurate and complete.

Compilation and dissemination of test results. TAP reviews the test results and creates consumer reports for distribution.

Operation of the Technology Assessment Program Information Center (TAPIC). The Information Center's goal is to expand the use of TAP resources. The TAP Alert, published periodically, announces the preliminary results of the latest testing. TAP then reviews the results and writes and distributes technical consumer reports.

For more information or to add your name to TAP's mailing list, call toll free 1-800-24-TAPIC. (In the Washington, D.C., metropolitan area call 301-251-5060).

James K. Stewart
Director
National Institute of Justice.

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BACKGROUND AND METHODOLOGY

Introduction

The Michigan State Police (MSP) have established a procurement policy that requires manufacturers to submit sealed bids for vehicles that will meet Michigan State Police vehicle specifications. Following the submission of bids, specific vehicles are road tested, and the interior environment of the vehicles are evaluated. The results are weighted to reflect the relative importance of each attribute as related to MSP operational requirements (see page 8), and the individual bids are adjusted to reflect overall performance. The contracts are awarded on the basis of the adjusted price.

The MSP testing program is conducted annually, with the assistance of the Technology Assessment Program (TAP) of the National Institute of Justice Assessment. This report, for the1987 model year, is the eighth in a series of TAP reports that presents the results of testing police patrol vehicles.

It should be noted that the categories and weights used by MSP are unique to its needs. Other departments wishing to employ this or a similar method are urged to carefully consider their own needs and to alter the weighting factors accordingly.

The 1987 police vehicles the Michigan State Police tested are:

Car	Engine*
Chevrolet Caprice	5.7L (350 cid) 4BBL
Chevrolet Caprice	4.3L (262 cid) TBI
Chevrolet Caprice (Canadian)	5.7L (350 cid) 4BBL
Dodge Diplomat	5.2L (318 cid) 4BBL
Ford Crown Victoria	5.8L (351 cid) VV
Ford Crown Victoria	5.OL (302 cid) PFI
Ford Mustang (AUTO)	5.OL (302 CID) PFI
Ford Mustang (MANUAL)	5.OL (302 cid) PFI
Plymouth Gran Fury	5.2L (318 cid) 4BBL
Plymouth Gran Fury	5.2L (318 cid) 2BBL
Plymouth Reliant	2.5L (153 cid) TBI

* PFI = Port fuel injection
TBI = Throttle body injection
VV = Variable Venturi
See Appendix A for a detailed description of each vehicle's hardware.

TESTING EQUIPMENT

The following test equipment is used during the acceleration, top speed, braking, and vehicle dynamics portion of the evaluation program.

LABORATORY EQUIPMENT CORPORATION (Labeco), Box 158, Mooresville, Indiana 46158

1. Tracktest Fifth Wheel
2. DD1.1 Digital Velocity Meter
3. DD2.1 Digital Distance Meter
4. Transmitter Assembly for DD1.1 and DD2.1
5. Digital-to-Analog Converter (two channel)
6. Astro-Med, Portable, Two-Channel, Strip Chart Recorder, Model "Dash-2"

   CHRONOMIX, Sunnyvale, California 94086

7. Multi-function Printing Timer - Compusport - 721

   MICRO SWITCH, Division of Honeywell, Freeport, Illinois 61032

8. Modulated L.E.D. Control (photoelectric micro switch) Model FE-MLS-3A

BID REQUIREMENTS

STATE OF MICHIGAN
DEPARTMENT OF MANAGEMENT AND BUDGET
OFFICE OF PURCHASING

Specifications for

Mich. 3905 - 0010
September 1986

POLICE CARS: PATROL
4-Door Sedan

MAKE:

Chevrolet Caprice
Dodge Diplomat
Ford Crown Victoria
Plymouth Gran Fury

BID REQUIREMENTS:

Prior to bidding, a car dealer, manufacturer, or representative will be required to furnish a "police package" vehicle for test purposes. All test vehicles shall be 1987 models which are equipped with the drive train, suspension, and brake components, as well as tires and interior appointments and instrumentation, as called for in the specification requirements on all vehicles in this requisition. Submitters of vehicles shall declare in writing any deviations from the specifications at the time of delivery of these test cars. Interior and exterior colors shall be the manufacturer's option. One extra set of engine belts and four (4) wheels and tires shall be supplied with each car submitted for testing. Vehicles submitted shall have undergone sufficient break-in to permit extended periods of maximum acceleration and high speed driving. Brakes on the test car shall have been burnished prior to delivery.

Test cars shall be delivered to the Michigan Department of State Police Headquarters, 714 South Harrison Road, East Lansing, Michigan no later than 5:00 p.m.,September 8, 1986. Each vehicle will be subjected to six competitive and qualification tests. Any vehicle which fails to meet the qualification tests found on page 6 of this specification will not be considered for this bid.

The State of Michigan shall not be responsible for any damage during the tests, or the condition of the vehicle when returned to the submitter after testing. Furthermore, all cars tested will be at the owner's risk for any damage occurring to the vehicles for any reason. The test vehicles will be tested and driven under the supervision of the Michigan Department of State Police, and will be tested and driven by employees of the department or personnel designated by the department.

Vehicles used for testing will be returned to the submitter no later than one (1) month following the completion of testing.

SCORING AND BID ADJUSTMENT FORMULA:

The vendor's bid for each vehicle which passes the qualification tests will be artificially adjusted based on the scoring and bid adjustment methodologies found on page seven of this specification. The vehicle to be purchased will be determined by the adjusted low bid price. Purchase price will be that quoted by the vendor.

SPECIFICATIONS:

Model - 1987 Current New - Standard Factory Equipped.

VEHICLES ARE TO BE FACTORY EQUIPPED WITH THE FOLLOWING ITEMS UNLESS DEALER INSTALLATION IS HEREIN PERMITTED:

Air-Conditioning:	System must be designed to prevent component damage due to high speed driving.
Alternator System:	Transistorized regulator, 100 amp minimum output capacity, minimum curb idle output of 45 amps (at manufacturer's recommended idle speed). Shall be of heavy duty design capable of surviving patrol car operation. Output ratings are for typical underhood ambient temperatures and not S.A.E. rating method.
Antenna:	Standard AM type, externally mounted or in the windshield type acceptable. (Dealer installation permitted.) Radio not to be included.
Anti-Freeze:	To be equipped with anti-freeze protection to -35°F minimum.
Ashtrays:	Front seat ashtray to be on instrument panel. Rear seat ashtrays shall be made inoperable. Rear seat ashtray alteration must be approved by Michigan State Police. (Dealer alteration permitted.)
Battery:	12 volt; minimum 500 cold cranking amps.
Body Side Molding:	Vehicle to be equipped with body side molding. Molding on front doors to be deleted. No holes to be on doors for moldings. (Dealer installation permitted.)
Brakes:	Power-assisted, low pedal position. Disc-type in front; drum-type in rear. Four wheel disc brakes are acceptable.
Cigarette Lighter:	To be located on instrument panel, wired independent of ignition system.
Cooling System:	Vehicle to have maximum size cooling system available; incorporating "coolant recovery" system.
Differential:	Heavy duty, limited slip required.
Engine:	Cubic inch displacement to be at manufacturer's option, providing that the car will meet or exceed the vehicle performance requirements found on page six of this specification.
Floor Mat:	Full floor mats, heavy duty rubber, front and rear.
Glass:	All windows shall be heat-absorbing (tinted) type.
Headlights:	To be equipped with high and low beam Quartz-Halogen headlights.
Hood Latch Release:	To be equipped with inside hood latch release.
Keys:	Four (4) keys to be furnished with each car. (Dealer may provide.)
License Plate Brackets:	Vehicle shall be equipped with front and rear license plate brackets.

Light, Combination Dome & Map:	Mounted on headliner on longitudinal center line of vehicle approximately 25" from windshield garnish molding. Dome light to be controlled by moving the instrument light intensity switch to maximum position. Operation to be independent of other lights. All door jamb switches to be made inoperative. Map lights to be controlled by individual integral switches, to direct a restricted beam of light to the driver and/or to the front seat passenger. Exact mounting position to be approved by Michigan State Police. If the combination dome and map light is unavailable, vehicle to be equipped with an auxiliary light mounted next to windshield garnish molding in center of vehicle, operation to be independent of other lights.
Light, Engine & Trunk Compartment:	To be equipped with engine and trunk compartment lights controlled with mercury switches.
Locks:	To be equipped with power door locks. All locks on a car to be keyed alike, different key for each car.
Mirrors - Inside:	Day/night type.
Outside:	Remote control type, installed on left-hand and right-hand doors. Controls to be within convenient reach of driver. Rectangular design approximate size 5" x 3"; minimum viewing area of 15 square inches.
Paint Color:	To be same as Dulux 93-032. Paint color code to be indicated on production code plate.
Pilot Inspection:	Prior to the initial delivery of patrol vehicles, the manufacturer shall schedule a pilot model inspection in order to determine compliance with the specifications. The inspection shall be conducted at the point of vehicle assembly or a location mutually agreed upon. The manufacturer shall be responsible for all costs incurred (not to exceed six representatives from the State of Michigan).
Predelivery Service:	Vehicles to undergo predelivery service as provided in the State of Michigan Vehicle Specification Book. (May be completed by dealer.)
Radio Noise Suppression:	Vehicle shall be equipped with standard AM and police radio noise suppression package, to include any optional grounding straps. The vehicle shall not interfere with signals received or transmitted by the mobile police radio system, nor shall the vehicle be affected by the operation of a police mobile transmitter.
Radio Speaker(s):	A permanent magnet speaker(s), either oval or round, to be mounted in the speaker opening(s) provided on the dash of the unit. Speaker(s) to be of a quality equal to automotive grade. Speaker leads connected to the speaker terminals, not grounded, shall extend one foot beyond the lower edge of the center of the dashboard.
One Speaker Installation:	Speaker to be located in the center of dashboard. Voice coil impedance 8 ohms, power handling capacity 8 watts, minimum.
Two Speaker Installation:	Speakers to be located on left and right sides of dashboard. Voice coil impedance 3.2 ohms, power handling capacity 8 watts, minimum.

Rear Window Defogger:	Electrical grid type. Control to be within convenient reach of driver, control switch to be clearly marked as to function.
Roof Top Reinforcement & Special Wiring:	Install a steel plate at least 1/8" thick x 10" wide to the underside of top, centered on the longitudinal centerline of the roof panel. Plate is to extend from the windshield header to the first top cross-member support and is to be welded at both ends. Plate to hold roof skin in its normal position for the purpose of supporting the overhead emergency light. Drill one 1/2" hole through roof panel and reinforcing plate, approximately 19" from windshield molding on longitudinal centerline. Exact placement of hole to be approved by Michigan State Police. Feed at least three insulated stranded wires (minimum of one #12 and two #16) through hole in roof, and route directly to either side of top at a right angle to the longitudinal centerline, thence to "A" pillar and down the inside of "A" pillar. Wires to extend 18" above roof hole and a minimum of 36" beyond where they emerge at bottom of "A" pillar. Top hole to be taped to prevent entry of water. Wires to be concealed between headlining and roof panel.
Seat Assembly, Front:	Split bench type, 60 (passenger side)/40 (driver's side) preferable, individually adjustable fore and aft, heavy duty interior construction designed for rugged police use, comfortable foam-padded seat cushions and backs.
Seat Belts:	Driver and right front passenger shoulder belt assembly to incorporate tension reliever and automatic release mechanism.
Service Manuals:	Vendor to supply four (4) service manuals at time of first vehicle delivery. (Dealer may provide.)
Spare Tire:	Tire and wheel to be mounted in trunk. Tire shall meet Michigan Specification 5260-S1, December 1985.
Speedometer:	Shall be calibrated to within ± 3 mph accuracy. Scale graduations to be linear and of 1 or 2 mph increments. 0-120 mph scale minimum.
Spotlights:	Unity Model #225 (equipped with Halogen spotlamp H7635) to be mounted on left- and right-hand "A" pillar. Left and right spotlights to be wired independent of ignition and individually fused with 10 to 20 amp capacity. Installation to be approved by Michigan State Police. (Halogen bulb installation by dealer permitted.)
Steering:	Power steering, manufacturer to provide steering gear which affords maximum firm "feel" and fast return characteristics, designed for high speed pursuit-type driving.
Steering Wheel:	Tilt type steering wheel required. Round with anti-slip surface.
Suspension System, Police:	To include heavy-duty springs, front and rear, in combination with heavy-duty shock absorbers, and front and rear heavy-duty stabilizer bars.
Technical Service Bulletin:	Manufacturer to supply four (4) copies of all technical service bulletins covering vehicles purchased under this contract.
Tires:	Tires to be Goodyear, Eagle GT/HR Radials, per State of Michigan Specification 5260-S1, December 1985.
Tools:	Wheel wrench and jack.

Transmission:	To be 3- or 4-speed, fully automatic, heaviest duty available. Must incorporate low-gear lockout to prevent manual shifting.
Trim:	Front and rear bumper valances to be color coordinated. Color to be approved by Michigan State Police.
Trunk Mat:	To be full floor.
Trunk Release, Remote:	To be equipped with electrically operated remote control trunk release. Control to be within convenient reach of the driver; in glove box not acceptable. Electric system wired independently of ignition switch. (Dealer may alter factory wiring to conform with this requirement.)
Upholstery:	Seats to be upholstered in heavy-duty cloth or combination of heavy-duty cloth and vinyl (blue). All vinyl not acceptable.
Wheels:	Fifteen-inch, heavy-duty construction designed for police use, black in color. Wheels to be equipped with hub caps.
Windshield Wipers/Washers:	Multiple speed electric, to include intermittent feature.
Wiring, Special:	One 14 gauge insulated wire running from center underdash to rear center trunk area, leaving 4 feet of this wire extending under the dash and 3 feet extending in the trunk for mounting rear shelf lights. Conduit not acceptable. (Dealer installation permitted.)

NOTE: No dealer advertising to be on vehicles.

QUALIFICATION TESTING

To qualify for bidding, all vehicles must meet each of the following performance standards:

1. **ACCELERATION**

   0 - 60 MPH - 12.9 seconds or less
   0 - 80 MPH - 23.0 seconds or less
   0 - 100 MPH - 42.3 seconds or less

   Each vehicle will make four acceleration runs, and the times for the four runs will be averaged.

2. A speed of 110 mph must be attained within 2 miles. After attaining the 110 mph minimum the vehicle will be accelerated to the maximum speed attainable within 14 miles.

3. **BRAKES**

   a. Test vehicles will be required to make four consecutive stops from 90 mph, with a constant deceleration rate of 22 feet per second/per second maintained from 90 to 0 mph. Immediately following this brake heat-up procedure, a controlled impending skid stop will be made from 60 mph.

   b. After a 4-minute wait, test "a" will be repeated. Immediately following, each vehicle is required to complete a panic (all wheel lock) stop from 60 mph. Evidence of brake fade and ability of the vehicle to stop in a straight line within its own lane will be evaluated.

COMPETITIVE TEST CATEGORIES

Each vehicle to be considered for the bid will be evaluated in the following weighted categories:

CATEGORY	WEIGHT (In Points)
Vehicle Dynamics	30
0 - 100 Acceleration	20
Braking	10
Top-Speed	20
Ergonomics/Communications	10
Fuel Economy	10
TOTAL	100 Points

SCORING METHODOLOGY

RAW SCORE: A raw score is developed for each vehicle by testing in each of the above categories. These scores are expressed in terms of seconds, miles-per-hour, feet-per-second- squared, points, and miles-per-gallon.

DEVIATION FACTOR: The best scoring vehicle in each test category receives a "0" as its deviation factor. The decimal equivalent of the percentage by which each of the other vehicles varies from the best scorer in that category is that vehicle's deviation factor.

WEIGHTED CATEGORY SCORE: Each vehicle's weighted category score is determined by multiplying its deviation factor (as determined above) by the category weight.

TOTAL WEIGHTED SCORE: The total weighted score for each vehicle is derived by adding together the six weighted category scores for that vehicle.

BID ADJUSTMENT METHODOLOGY

BID ADJUSTMENT FIGURE: The bid adjustment figure will be one percent (1%) of the lowest bid price received.

ACTUAL DOLLAR ADJUSTMENT: In order to determine the actual dollar amount by which each vehicle's bid price will be adjusted, the bid adjustment figure is multiplied by that vehicle's total weighted score.

ADJUSTED BID PRICE: The actual dollar adjustment amount arrived at for each vehicle is then added to that vehicle's actual bid price. The resultant figure is the adjusted bid price upon which the purchasing decision will be based.

INFORMATIONAL HARDWARE DESCRIPTION SUMMARY

MAKE MODEL	DODGE DIPLOMAT	FORD CROWN VIC	PLYMOUTH GRAN FURY	CHEVROLET CAPRICE
ENGINE DISPLACEMENT - CU. IN.	318	351	318	350
ENGINE DISPLACEMENT - LITERS	5.2	5.8	5.2	5.7
ENGINE FUEL SYSTEM	4BBL	VV	4BBL	4BBL
HORSEPOWER (SAE NET)	175	180	175	180
TORQUE - FT-LBS	250	285	250	285
COMPRESSION RATIO	8.0:1	8.3:1	8.0:1	8.6:1
AXLE RATIO	2.94:1	2.73:1	2.94:1	3.08:1
TURNING CIRCLE (CURB TO CURB)	40.7	39.1	40.7	38.7
TRANSMISSION	AUTOMATIC	AUTOMATIC	AUTOMATIC	AUTOMATIC
TRANSMISSION MODEL NUMBER	A999	PKA-AS	A999	700R4
LOCK UP TORQUE CONVERTER	YES	YES	YES	YES
TRANSMISSION OVERDRIVE	NO	YES	NO	YES
TIRE SIZE	P215/70	P225/70	P215/70	P225/70
RIM SIZE	15	15	15	15
GROUND CLEARANCE - INCHES - MIN	6.0	5.2	6.0	5.8
BRAKE - FRONT TYPE	DISC	DISC	DISC	DISC
BRAKE - REAR TYPE	DRUM	DRUM	DRUM	DRUM
FUEL CAPACITY - GALLONS	18	20	18	25
FUEL CAPACITY - LITERS	68.1	75.7	68.1	94.6
OVERALL LENGTH - INCHES	204.6	211	204.6	212.2
OVERALL HEIGHT - INCHES	55.1	55.3	55.1	56.4
WEIGHT - TEST	3885	4079	3924	3948
WHEELBASE - INCHES	112.7	114.3	112.7	116.0
HEAD ROOM - FRONT - INCHES	39.3	37.9	39.3	39.5
HEAD ROOM - REAR - INCHES	37.7	37.2	37.7	38.2
LEG ROOM - FRONT - INCHES - MAX	42.5	43.5	42.5	42.2
LEG ROOM - REAR - INCHES - MIN	36.6	39.3	36.6	39.1
SHOULDER ROOM - FRONT - INCHES	56.0	61.6	56.0	60.5
SHOULDER ROOM - REAR - INCHES	55.9	61.6	55.9	60.5
HIP ROOM - FRONT - INCHES	53.5	61.0	53.5	55.0
HIP ROOM - REAR - INCHES	53.2	56.9	53.2	55.3
INTERIOR VOLUME - FRONT - CU. FT.	54.1	57	54.1	58.1
INTERIOR VOLUME - REAR - CU. FT.	44.6	54	44.6	52.2
INTERIOR VOLUME - COMB - CU. FT.	98.7	111	98.7	110.3
TRUNK VOLUME - CU. FT.	15.6	21.4	15.6	20.9
E.P.A. MILEAGE - CITY	13	13	13	14
E.P.A. MILEAGE - HIGHWAY	15	18	15	20
E.P.A. MILEAGE - COMBINED	14	15	14	16

INFORMATIONAL HARDWARE DESCRIPTION SUMMARY

MAKE MODEL	FORD MUSTANG	FORD MUSTANG	CHEVROLET CAPRICE	PLYMOUTH GRAN FURY	FORD CROWN VIC	PLYMOUTH RELIANT
ENGINE DISPLACEMENT - CU. IN.	302	302	262	318	302	153
ENGINE DISPLACEMENT - LITERS	5.0	5.0	4.3	5.2	5.0	2.5
ENGINE FUEL SYSTEM	PFI	PFI	TBI	2BBL	PFI	TBI
HORSEPOWER (SAE NET)	225	225	140	140	160	100
TORQUE - FT-LBS	300	300	225	265	280	133
COMPRESSION RATIO	9.2:1	9.2:1	9.3:1	9.0:1	8.9:1	9.0:1
AXLE RATIO	2.73:1	3.08:1	3.08:1	2.26:1	3.08:1	3.22:1
TURNING CIRCLE (CURB TO CURB)	37.4	37.4	38.7	40.7	39.1	35.2
TRANSMISSION	AUTOMATIC	5 - SPEED	AUTOMATIC	AUTOMATIC	AUTOMATIC	AUTOMATIC
TRANSMISSION MODEL NO.	PKA-CY	REP-AK	700R4	A727	PKA-CN	A949
LOCK UP TORQUE CONVERTER	YES	N/A	YES	YES	YES	YES
TRANSMISSION OVERDRIVE	YES	YES	YES	NO	YES	NO
TIRE SIZE	P225/60	P225/60	P225/70	P215/70	P225/70	P185/70
RIM SIZE	15	15	15	15	15	14
GROUND CLEARANCE - INCHES - MIN	4.5	4.5	5.8	6.0	5.2	4.6
BRAKE - FRONT TYPE	DISC	DISC	DISC	DISC	DISC	DISC
BRAKE - REAR TYPE	DRUM	DRUM	DRUM	DRUM	DRUM	DRUM
FUEL CAPACITY - GALLONS	15.4	15.4	25	18	18	14
FUEL CAPACITY - LITERS	58.3	58.3	94.6	68.1	68.1	53.0
OVERALL LENGTH - INCHES	179.6	179.6	212.2	204.6	211	178.6
OVERALL HEIGHT - INCHES	52.1	52.1	56.4	55.1	55.3	52.9
WEIGHT - TEST	3270	3198	3803	3895	4051	2712
WHEELBASE - INCHES	100.5	100.5	116.0	112.7	114.3	100.3
HEAD ROOM - FRONT - INCHES	37.0	37.0	39.5	39.3	37.9	38.6
HEAD ROOM - REAR - INCHES	35.9	35.9	38.2	37.7	37.2	37.8
LEG ROOM - FRONT - INCHES - MAX	41.7	41.7	42.2	42.5	43.5	42.2
LEG ROOM - REAR - INCHES - MIN	30.7	30.7	39.1	36.6	39.3	35.4
SHOULDER ROOM - FRONT - INCHES	55.4	55.4	60.5	56.0	61.6	55.4
SHOULDER ROOM - REAR - INCHES	54.3	54.3	60.5	55.9	61.6	55.9
HIP ROOM - FRONT - INCHES	56.1	56.1	55.0	53.5	61.0	55.6
HIP ROOM - REAR - INCHES	47.1	47.1	55.3	53.2	56.9	56.3
INTERIOR VOLUME - FRONT - CU. FT.	50	50	58.1	54.1	57	52.2
INTERIOR VOLUME - REAR - CU. FT.	34	34	52.2	44.6	54	43.3
INTERIOR VOLUME - COMB. - CU. FT.	84	84	110.3	98.7	111	95.5
TRUNK VOLUME - CU. FT.	10	10	20.9	15.6	21.4	15.0
E.P.A. MILEAGE - CITY	18	16	18	15	17	21
E.P.A. MILEAGE - HIGHWAY	27	25	27	17	27	26
E.P.A. MILEAGE - COMBINED	21	19	21	16	21	23

VEHICLE DYNAMICS TESTING

TEST OBJECTIVE

Determine each vehicle's high-speed pursuit-handling characteristics and performance in comparison to the other vehicles in the test group. The course used is a road-racing-type course, containing hills, curves, and corners and is 1.635 miles in length. The course simulates actual conditions encountered in pursuit situations in the field, with the exception of other traffic. The evaluation will be a true test of the success or failure of the vehicle manufacturers in offering balanced packages in terms of their blending of suspension components, acceleration capabilities, and braking characteristics of their cars. Serious deficiencies in handling, acceleration, or braking will result in a relatively poor score on this test.

METHODOLOGY

Each vehicle will be driven over the course for at least 15 timed laps, using a minimum of three separate drivers. The final score for each vehicle will be the average of the fastest 12 timed laps.

VEHICLE DYNAMICS TESTING

VEHICLES	DRIVERS	LAP 1	LAP 2	LAP 3	LAP 4	AVERAGE *
	FLOATE	1:29.14	1:29.74	1:29.74	1:30.11	
DODGE	RING	1:30.03	1:30.37	1:29.91	1:30.05	
DIPLOMAT	STEENDAM	1:30.07	1:29.97	1:30.33	1:29.99	
318-4BBL	HALLIDAY	1:30.63	1:30.81	1:30.49	1:31.11	
OVERALL AVERAGE						1:29.95
	FLOATE	1:28.42	1:30.33	1:28.52	1:28.92	
FORD	RING	1:28.16	1:28.43	1:28.33	1:28.78	
CROWN VIC.	STEENDAM	1:29.28	1:29.00	1:29.83	1:29.39	
351-VV	HALLIDAY	1:28.07	1:28.59	1:28.66	1:29.15	
OVERALL AVERAGE						1:28.59
	FLOATE	1:29.91	1:29.71	1:30.06	1:29.79	
PLYMOUTH	RING	1:29.64	1:29.87	1:30.17	1:29.81	
GRAN FURY	STEENDAM	1:29.71	1:29.06	1:29.54	1:29.92	
318-4BBL	HALLIDAY	1:30.59	1:30.75	1:31.50	1:31.21	
OVERALL AVERAGE						1:29.77
	FLOATE	1:28.28	1:28.49	1:28.96	1:28.08	
CHEVROLET	RING	1:28.14	1:28.30	1:28.51	1:28.48	
CAPRICE	STEENDAM	1:28.56	1:28.83	1:28.66	1:28.15	
350-4BBL	HALLIDAY	1:28.51	1:28.66	1:28.38	1:28.01	
OVERALL AVERAGE						1:28.32

	FLOATE	1:23.52	1:22.96	1:23.79	1:24.09	
FORD	RING	1:22.96	1:22.84	1:23.33	1:23.99	
MUSTANG AUTO	STEENDAM	1:24.15	1:24.67	1:24.47	1:24.77	
302-PFI	HALLIDAY	1:24.55	1:25.02	1:25.02	1:25.26	
OVERALL AVERAGE						1:23.78
	FLOATE	1:21.79	1:21.70	1:21.69	1:21.83	
FORD	RING	1:22.53	1:22.23	1:22.38	1:22.39	
MUSTANG 5 SPD.	STEENDAM	1:22.89	1:22.97	1:22.79	1:22.66	
302-PFI	HALLIDAY	1:22.01	1:21.74	1:22.50	1:21.39	
OVERALL AVERAGE						1:22.02

	FLOATE	1:32.47	1:32.39	1:32.60	1:32.84	
PLYMOUTH	RING	1:33.40	1:33.30	1:33.29	1:32.98	
RELIANT	STEENDAM	1:33.38	1:33.28	1:33.06	1:32.99	
153-TBI	HALLIDAY	1:33.18	1:32.88	1:33.20	1:32.98	
OVERALL AVERAGE						1:32.90

All times in minutes, seconds, and hundredths of a second, i.e., 1.34.96 = 1 minute, 34 seconds, and 96/100 of a second.
All tests conducted on Michigan International Speedway road course.
* Calculated from 12 best laps.

ACCELERATION AND TOP SPEED TESTING

ACCELERATION TEST OBJECTIVE

Qualification Test: Determine the ability of each test vehicle to accelerate from a standing start to 60 mph, 80 mph, and 100 mph, within the time allowances contained in the patrol vehicle specifications.

Competitive Test: Determine each test vehicle's acceleration time to 100 mph.

METHODOLOGY

Using a fifth wheel in conjunction with an electronic digital speed meter and an electronic multi-function timer, each vehicle is driven through four acceleration sequences, two northbound and two southbound, to allow for wind direction. The four resulting times for each target speed are averaged and the averaged times used to derive scores on the competitive test.

TOP SPEED TEST OBJECTIVE

Qualification Test: Determine each vehicle's ability to attain a speed of 110 mph within a distance of 2 miles.

Competitive Test Determine the actual top speed attainable within a distance of 14 miles from a standing start.

METHODOLOGY

Following the fourth acceleration run, the vehicle shall continue to accelerate to the top speed attainable within 14 miles from the start of the run. The highest speed attained within the 14 mile distance will be the vehicle's score on the competitive test.

BRAKE TESTING

TEST OBJECTIVE

Qualification Test: Determine the acceptability of each vehicle's braking performance for pursuit service. The ability of a vehicle to make a straight lock-up stop within its own lane and evidence of brake fade will be evaluated.

Competitive Test: Determine the deceleration rate attained by each vehicle on two 60 - 0 mph impending skid stops. Vehicles will be scored on their average deceleration rate attained in comparison with the other vehicles in the test group.

METHODOLOGY

Each vehicle will first be required to make four decelerations at 22 ft./sec.^{2} from 90 - 0 mph, with the driver using a decelerometer to maintain the deceleration rate. The vehicle will then make one 60 - 0 mph impending skid. The exact initial velocity at the beginning of the deceleration and the exact distance required to make the stop will be recorded by means of a fifth wheel in conjunction with electronic digital speed and distance meters. From these figures, the average deceleration rate for the stop can be calculated. Following a four-minute cooling period, this sequence will be repeated. This second sequence will be followed by one 60 - 0 mph full four-wheel-lock stop, both to determine ability of the brakes to lock and ability of the vehicle to stop in a straight line within its lane.

DECELERATION RATE FORMULA

$$\text{Deceleration Rate (DR)} = \frac{\text{Initial Velocity* (IV) squared}}{\text{2 times Stopping Distance (S D)}} = \frac{(IV)^2}{2(SD)}$$

EXAMPLE:

Initial Speed 89.175 ft/sec (60.8MPH x 1.4667*)
Stopping Distance 171.4 ft.

$$DR = \frac{(IV)^2}{2(SD)} = \frac{(89.175)^2}{2(171.4)} = \frac{7952.24}{342.8} = 23.198 \text{ F/SEC}^2$$

Once a vehicle's average deceleration rate has been determined, it is possible to calculate the stopping distance from any given speed by utilizing the following formula:

Select a speed; translate that speed into feet-per-second; square the feet-per-second figure by multiplying it by itself; divide the resultant figure by 2; divide the remaining figure by the average deceleration rate of the vehicle in question.

EXAMPLE:

60 mph = 88.002 ft. per sec. x 88.002 = 7744.352 ÷ 2 = 3872.176 ÷ 23.198 ft. per sec. 2 = 166.9 feet.

*** Initial velocity must be expressed in terms of feet per second, with 1 mile per hour being equal to 1.4667 feet per second.**

SUMMARY OF ACCELERATION, TOP SPEED AND BRAKE TESTING

	DODGE DIPLOMAT 318-4BBL	FORD CROWN VIC. 351-VV	PLYMOUTH GRAN FURY 318-4BBL	CHEVROLET CAPRICE 350-4BBL
SPEED - 4 RUN AVERAGE				
0 - 20 MPH (Sec)	2.93	2.69	3.11	2.15
0 - 30 MPH (Sec)	4.76	4.42	4.78	3.43
0 - 40 MPH (Sec)	6.68	6.40	6.56	5.20
0 - 50 MPH (Sec)	9.50	8.82	9.33	7.59
0 - 60 MPH (Sec)	12.72	12.02	12.39	10.32
0 - 70 MPH (Sec)	16.77	15.79	15.99	13.84
0 - 80 MPH (Sec)	23.25	20.86	22.09	18.79
0 - 90 MPH (Sec)	30.64	28.25	29.70	25.30
0 - 100 MPH (Sec)	40.53	39.30	38.64	34.62
TOP SPEED	116.90	115.20	117.50	118.00
DISTANCE TO REACH				
100 MPH (Miles)*	0.76	0.73	0.72	0.67
110 MPH (Miles)*	1.37	1.56	1.25	1.08
QUARTER MILE (average)*				
Time (SEC)	19.35	18.93	19.18	17.85
Speed (MPH)	73.50	76.25	75.00	77.75
BRAKING PHASE I				
Initial Speed (MPH)	60.10	60.20	59.70	60.00
Stopping Distance (Ft)	146.20	147.50	139.60	150.80
Deceleration Rate (Ft/Sec^2)	26.57	26.43	27.46	25.68
BRAKING PHASE II				
Initial Speed (MPH)	60.30	60.30	59.80	61.00
Stopping Distance (Ft)	140.20	157.10	140.30	150.70
Deceleration Rate (Ft/Sec^2)	27.90	24.89	27.42	26.56
Deceleration Rate(Average)(Ft/Sec^2)	27.24	25.66	27.44	26.12

*** Obtained from Strip Chart Recordings of Acceleration Runs**

SUMMARY OF ACCELERATION, TOP SPEED AND BRAKE TESTING

	FORD MUSTANG 302 AUTO	FORD MUSTANG 302 5-SPD	CHEVROLET CAPRICE 262-TBI	PLYMOUTH GRAN FURY 318-2BBL	FORD CROWN VIC. 302-PFI	PLYMOUTH RELIANT 153-TBI
SPEED - 4 RUN AVERAGE						
0 - 20 MPH (Sec)	2.05	1.84	2.78	3.48	2.24	3.14
0 - 30 MPH (Sec)	3.33	3.00	4.50	5.76	3.80	5.07
0 - 40 MPH (Sec)	4.74	4.22	6.86	8.14	5.94	7.52
0 - 50 MPH (Sec)	6.19	5.92	10.13	10.84	8.55	10.84
0 - 60 MPH (Sec)	8.16	7.64	13.94	14.65	11.85	15.04
0 - 70 MPH (Sec)	10.45	10.33	19.17	19.48	15.83	21.25
0 - 80 MPH (Sec)	13.16	12.85	27.27	25.73	21.50	31.31
0 - 90 MPH (Sec)	17.44	15.95	38.57	34.88	29.78	47.84
0 - 100 MPH (Sec)	21.73	20.42	59.22	52.44	43.47	
TOP SPEED	139.10	139.60	106.00	113.30	109.20	100.40
DISTANCE TO REACH						
100 MPH (Miles)*	0.39	0.37	1.34	1.05	0.86	4.44
110 MPH (Miles)*	0.55	0.52		2.87		
QUARTER MILE (average)*						
Time (SEC)	16.33	16.00	19.90	20.63	18.55	20.38
Speed (MPH)	86.75	89.75	71.00	71.75	74.00	68.50
BRAKING PHASE I						
Initial Speed (MPH)	60.70	60.80				59.80
Stopping Distance (Ft)	169.10	169.80				150.90
Deceleration Rate (Ft/Sec^2)	23.44	23.42				25.49
BRAKING PHASE II						
Initial Speed (MPH)	60.50	60.00				60.90
Stopping Distance (Ft)	172.30	157.70				164.40
Deceleration Rate (Ft/Sec^2)	22.85	24.55				24.27
Deceleration Rate(Ave.)(Ft/Sec^2)	23.14	23.99				24.88

*** Obtained from Strip Chart Recordings of Acceleration Runs**

ACCELERATION & TOP SPEED TESTS

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

ACCELERATION

WIND VELOCITY 6 MPH WIND DIRECTION 290 degrees TEMPERATURE 54 degrees F

MAKE AND MODEL Dodge Diplomat 318-4BBL BEGINNING TIME 9:25 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60	12.9 SECONDS	12.72	12.82	12.57	12.76	12.72
0-80	23.0 SECONDS	23.92	23.25	23.15	22.68	23.25
0-100	42.3 SECONDS	41.44	40.32	40.10	40.25	40.53

DISTANCE TO REACH 110 MPH 1.37 MILES TOP SPEED ATTAINED 116.9 MPH

ACCELERATION

WIND VELOCITY 12 MPH WIND DIRECTION 290 degrees TEMPERATURE 58 degrees F

MAKE AND MODEL Ford Crown Victoria 351-VV BEGINNING TIME 10:05 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60	12.9 SECONDS	12.04	11.87	12.08	12.08	12.02
0-80	23.0 SECONDS	21.10	20.92	20.70	20.71	20.86
0-100	42.3 SECONDS	40.43	39.06	39.50	38.21	39.30

DISTANCE TO REACH110 MPH 1.56 MILES TOP SPEED ATTAINED 115.2 MPH

***Michigan State Police Minimum Requirements**

ACCELERATION & TOP SPEED TESTS

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

ACCELERATION

WIND VELOCITY 6 MPH WIND DIRECTION 270 degrees TEMPERATURE 60 degrees F

MAKE AND MODEL Plymouth Gran Fury 318-4BBL BEGINNING TIME 10:39 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60	12.9 SECONDS	12.09	12.41	12.57	12.48	12.39
0-80	23.0 SECONDS	21.62	22.39	21.99	22.34	22.09
0-100	42.3 SECONDS	38.86	38.08	39.17	38.44	38.64

DISTANCE TO REACH 110 MPH 1.25 MILES TOP SPEED ATTAINED 117.5 MPH

ACCELERATION

WIND VELOCITY 10 MPH WIND DIRECTION 290 degrees TEMPERATURE 61 degrees F

MAKE AND MODEL Chevrolet Caprice 350-4BBL BEGINNING TIME 11:07 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60	12.9 SECONDS	10.18	10.11	10.75	10.24	10.32
0-80	23.0 SECONDS	18.57	18.05	19.24	19.28	18.79
0-100	42.3 SECONDS	34.63	33.70	35.37	34.78	34.62

DISTANCE TO REACH 110 MPH 1.08 MILES TOP SPEED ATTAINED 118.0 MPH

*Michigan State Police Minimum Requirements

ACCELERATION & TOP SPEED TESTS

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

ACCELERATION

WIND VELOCITY 6 MPH WIND DIRECTION 270 degrees TEMPERATURE 51 degrees F

MAKE AND MODEL Ford Mustang Automatic 302-PFI BEGINNING TIME 8:58 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		8.35	7.97	8.11	8.21	8.16
0-80		13.36	12.86	13.03	13.37	13.16
0-100		22.29	21.48	21.46	21.69	21.73

DISTANCE TO REACH 110 MPH 0.55 MILES TOP SPEED ATTAINED 139.1 MPH

ACCELERATION

WIND VELOCITY 8 MPH WIND DIRECTION 280 degrees TEMPERATURE 62 degrees F

MAKE AND MODEL Ford Mustang 5 Speed 302-PFI BEGINNING TIME 11:37 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		7.48	7.73	7.68	7.67	7.64
0-80		12.41	13.23	13.04	12.72	12.85
0-100		20.00	20.75	20.46	20.46	20.42

DISTANCE TO REACH 110 MPH 0.52 MILES TOP SPEED ATTAINED 139.6 MPH

*Michigan State Police Minimum Requirements

ACCELERATION & TOP SPEED TESTS

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

ACCELERATION

WIND VELOCITY 4 MPH WIND DIRECTION 330 degrees TEMPERATURE 64 degrees F

MAKE AND MODEL Chevrolet Caprice 262-TBI BEGINNING TIME 2:58 pm

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		13.75	14.13	13.85	14.03	13.94
0-80		26.44	27.96	26.42	28.26	27.27
0-100		54.85	62.10	56.02	63.90	59.22

DISTANCE TO REACH 100 MPH 1.34 MILES TOP SPEED ATTAINED 106.0 MPH

ACCELERATION

WIND VELOCITY 8 MPH WIND DIRECTION 340 degrees TEMPERATURE 65 degrees F

MAKE AND MODEL Plymouth Gran Fury 318-2BBL BEGINNING TIME 2:30 pm

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		14.27	14.90	14.71	14.70	14.65
0-80		25.32	25.98	25.00	26.62	25.73
0-100		51.77	55.88	48.84	53.25	52.44

DISTANCE TO REACH 100 MPH 1.05 MILES TOP SPEED ATTAINED 113.3 MPH

***Michigan State Police Minimum Requirements**

ACCELERATION & TOP SPEED TESTS

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

ACCELERATION

WIND VELOCITY 6 MPH WIND DIRECTION 290 degrees TEMPERATURE 66 degrees F

MAKE AND MODEL Ford Crown Victoria 302-PFI BEGINNING TIME 2:00 pm

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		12.10	11.90	11.56	11.82	11.85
0-80		21.93	21.43	21.30	21.32	21.50
0-100		44.53	43.06	43.35	42.95	43.47

DISTANCE TO REACH 100 MPH 0.86 MILES TOP SPEED ATTAINED 109.2 MPH

ACCELERATION

WIND VELOCITY 4 MPH WIND DIRECTION 250 degrees TEMPERATURE 50 degrees F

MAKE AND MODEL Plymouth Reliant 153-TBI BEGINNING TIME 8:30 am

SPEEDS	TIME REQUIREMENT*	RUN #1	RUN #2	RUN #3	RUN #4	AVERAGE
0-60		15.29	15.25	14.70	14.93	15.04
0-80		32.24	30.95	31.63	30.40	31.31
0-100		0.00	0.00	0.00	0.00	0.00

DISTANCE TO REACH 100 MPH 4.44 MILES TOP SPEED ATTAINED 100.4 MPH

***Michigan State Police Minimum Requirements**

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Dodge **MODEL:** Diplomat **TEMPERATURE:** 61 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.1 mph Stopping Distance 146.2 ft.

Deceleration Rate 26.57 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.3 mph Stopping Distance 140.2 ft.

Deceleration Rate 27.90 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 27.24 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Ford **MODEL:** Crown Victoria **TEMPERATURE:** 64 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.2 mph Stopping Distance 147.5 ft.

Deceleration Rate 26.43 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.3 mph Stopping Distance 157.1 ft.

Deceleration Rate 24.89 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 25.66 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Plymouth **MODEL:** Gran Fury **TEMPERATURE:** 64 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 59.7 mph Stopping Distance 139.6 ft.

Deceleration Rate 27.46 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - .2 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 59.8 mph Stopping Distance 140.3 ft.

Deceleration Rate 27.42 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 27.44 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Chevrolet **MODEL:** Caprice **TEMPERATURE:** 65 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.0 mph Stopping Distance 150.8 ft.

Deceleration Rate 25.68 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 61.0 mph Stopping Distance 150.7 ft.

Deceleration Rate 26.56 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 26.12 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Ford **MODEL:** Mustang Automatic **TEMPERATURE:** 58 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.7 mph Stopping Distance 169.1 ft.

Deceleration Rate 23.44 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.5 mph Stopping Distance 172.3 ft.

Deceleration Rate 22.85 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 23.14 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds DATE: 9/13/86

MAKE: Ford MODEL: Mustang 5 Speed TEMPERATURE: 67 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.8 mph Stopping Distance 169.8 ft.

Deceleration Rate 23.42 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.0 mph Stopping Distance 157.7 ft.

Deceleration Rate 24.55 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 23.99 ft/sec^2

BRAKE TESTING

TEST LOCATION: Chrysler Proving Grounds **DATE:** 9/13/86

MAKE: Plymouth **MODEL:** Reliant **TEMPERATURE:** 55 degrees F

PHASE I

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 59.8 mph Stopping Distance 150.9 ft.

Deceleration Rate 25.49 ft/sec^2

PHASE II

BRAKE HEAT-UP (90 mph - 22 ft per sec^2)

TEST (60 mph - Impending skid - maximum deceleration rate attainable)

Initial Speed 60.9 mph Stopping Distance 164.4 ft.

Deceleration Rate 24.27 ft/sec^2

PHASE III

TEST (60 mph - full wheel lock-up)	YES/NO
Evidence of severe fading prior to locking?	NO
Brakes would lock?	YES
Vehicle stopped in straight line?	YES
Vehicle stopped within correct lane?	YES

AVERAGE SCORE 24.88 ft/sec^2

ERGONOMICS AND COMMUNICATIONS

TEST OBJECTIVE

Rate each vehicle's ability to: 1) provide a suitable environment for the patrol officer in the performance of his/her assigned tasks; and 2) accommodate the required communications and emergency warning equipment and assess the relative difficulty of such installations.

METHODOLOGY

Utilizing the ergonomics portion of the form, a minimum of four officers will independently and individually score each vehicle on comfort and instrumentation. The communications portion of the evaluation will be conducted by personnel from the Radio Installation and Garage Units, based upon the relative difficulty of the necessary installations. Each factor will be graded on a 1 to 10 scale, with 1 representing "totally unacceptable," 5 representing "average," and 10 representing "superior" scores. The scores will be averaged to minimize personal prejudice for or against any given vehicle.

ERGONOMICS AND COMMUNICATIONS

	DODGE DIPLOMAT	FORD CROWN VIC	PLYMOUTH GRAN FURY	CHEVROLET CAPRICE
1. ERGONOMICS				
FRONT SEAT				
Padding	7.40	7.20	7.40	4.40
Depth of Bench	6.60	7.20	6.60	7.00
Angle of Back	6.20	5.80	6.20	6.60
Adjustability-front to rear	6.00	5.80	6.00	6.80
Upholstery	7.40	7.20	7.40	6.50
Split Bench Design	7.20	7.80	7.20	7.00
Headroom	6.00	6.60	6.00	8.20
Seatbelts	6.80	7.20	6.80	7.80
Ease of Entry and Exit	6.80	6.80	6.80	8.40
REAR SEAT				
Legroom-front seat back	4.60	7.00	4.60	6.20
Ease of Entry and Exit	4.80	5.40	4.80	5.80
INSTRUMENTATION				
Clarity	7.60	7.40	7.60	7.00
Placement	7.60	6.80	7.60	7.40
VEHICLE CONTROLS				
Pedals, Size and Position	6.40	5.80	6.40	8.00
Position of Window Crank	7.00	6.80	7.00	6.60
Position of Inside Door Release	7.20	6.40	7.20	7.60
Position of Automatic Door Lock Switch	4.50	7.80	4.50	8.00
Position of Outside Rear-View Mirror Controls	5.40	7.60	5.40	7.60
Steering Wheel, Size/Tilt Release/Surface	8.40	6.40	8.40	8.40
Heater/AC Vent Placement and Adjustability	7.60	6.20	7.60	6.60
Auxiliary Dome/Map Light Placement/Visibility	6.50	8.70	6.50	8.00
VISIBILITY				
Front	8.20	8.00	8.20	8.60
Rear	7.60	7.20	7.60	8.20
Left Rear Quarter	7.80	6.20	7.80	7.60
Right Rear Quarter	7.20	5.60	7.20	7.60
Outside Rear-View Mirrors	6.80	6.40	6.80	7.40
2. COMMUNICATIONS				
Dash Accessibility	7.40	5.40	7.40	7.80
Trunk Accessibility	8.60	6.80	8.60	9.20
Engine Accessibility	8.30	3.70	8.30	9.00
3. TOTALS	199.90	193.20	199.90	215.30

ERGONOMICS AND COMMUNICATIONS

	PLYMOUTH RELIANT	FORD MUSTANG
1. ERGONOMICS		
FRONT SEAT		
Padding	6.20	7.40
Depth of Bench	5.80	6.60
Angle of Back	6.00	7.40
Adjustability-front to rear	6.00	6.40
Upholstery	7.00	6.80
Split Bench Design	6.40	6.80
Headroom	6.60	7.20
Seatbelts	7.20	7.00
Ease of Entry and Exit	4.80	6.00
REAR SEAT		
Legroom-front seat back	4.60	2.80
Ease of Entry and Exit	3.80	2.20
INSTRUMENTATION		
Clarity	6.40	8.00
Placement	6.20	7.60
VEHICLE CONTROLS		
Pedals, Size and Position	6.60	5.80
Position of Window Crank	6.40	7.50
Position of Inside Door Release	4.60	6.00
Position of Automatic Door Lock Switch	3.00	8.00
Position of Outside Rear-View Mirror Controls	5.60	6.20
Steering Wheel, Size/Tilt Release/Surface	7.40	7.80
Heater/AC Vent Placement and Adjustability	6.00	6.20
Auxiliary Dome/Map Light Placement/Visibility	5.80	5.20
VISIBILITY		
Front	8.20	8.20
Rear	7.40	7.20
Left Rear Quarter	7.40	6.80
Right Rear Quarter	7.00	6.60
Outside Rear-View Mirrors	7.60	6.40
2. COMMUNICATIONS		
Dash Accessibility	8.00	3.00
Trunk Accessibility	5.60	1.00
Engine Accessibility	6.30	1.30
3. TOTALS	179.90	175.40

FUEL ECONOMY

TEST OBJECTIVE

Determine the fuel economy potential of all vehicles being evaluated. The data used for scoring are both valid and reliable in a comparison sense, while not necessarily being an accurate predictor of actual economy.

METHODOLOGY

The vehicles will be scored based on estimates for city fuel economy to the nearest 1/10th mile per gallon developed from data supplied by the vehicle manufacturer.

VEHICLES MAKE/MODEL		E.P.A.MILES PER GALLON		
		CITY*	HIGHWAY	COMBINED
DODGE DIPLOMAT	318 4BBL	13 (12.7)	15	14
FORD CROWN VICTORIA	351 VV	13 (12.9)**	18**	15**
PLYMOUTH GRAN FURY	318 4BBL	13 (12.7)	15	14
CHEVROLET CAPRICE	350 4BBL	14 (13.9)**	20**	16**
FORD MUSTANG	302 PFI AUTOMATIC	18 (17.6)	27	21
FORD MUSTANG	302 PFI 5 SPD	16 (16.4)**	25**	19**
CHEVROLET CAPRICE	262 TBI	18 (18.3)**	27**	21**
PLYMOUTH GRAN FURY	318 2BBL	15 (14.8)	17	16
FORD CROWN VICTORIA	302 PFI	17 (17.5)	27	21
PLYMOUTH RELIANT	153 TBI	21 (21.2)	26	23

* Scored on city mileage only to the nearest 1/10 mpg.

** Projected figures - Not certified by EPA as of 9/8/86

SCORING AND BID ADJUSTMENT METHODOLOGY*

Any vehicle that fails to meet the minimum requirements of the purchase specification, as determined by inspection and testing, is eliminated from consideration. The Michigan State Police procedure for the final award of the contract for police vehicles involves several steps.

STEP 1 - RAW SCORES

Raw scores are developed, through testing, for each vehicle in each of six evaluation categories. The raw scores are expressed in terms of seconds, feet-per-second-squared, miles-per-hour, points, and miles-per-gallon.

VEHICLE DYNAMICS (secs)	ACCELERATION (secs)	BRAKING RATE (f/sec2)	TOP SPEED (mph)	ERGONOMICS & COMMUNICATIONS (points)	FUEL ECONOMY (mpg)
92.210	45.790	26.380	115.000	173.900	14.300

STEP 2- DEVIATION FACTOR

In each evaluation category, the best scoring vehicle's score is used as the benchmark against which the other vehicle's scores are compared. (In the Vehicle Dynamics and Acceleration categories, the lowest score is best, while in the remainder of the categories the highest is best.) The best scoring vehicle in a given category receives a "deviation factor" of "0". The "deviation factor" is then calculated by determining the absolute difference between each vehicle's raw score and the best score in that category. The absolute difference is then divided by the best score with the result being the "deviation factor."

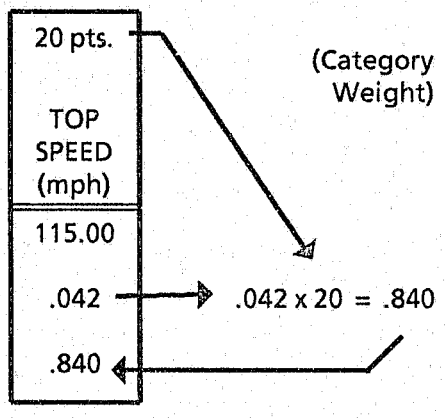
CAR MAKE MODEL	TOP SPEED
Car "A"	115.000 .042
Car "B"	118.800 .010
Car "C"	117.900 .018
Car "D"	120.000 0

EXAMPLE:

Best Score (Car "D")		Other Vehicle Score (Car "A")		Absolute Difference		Best Score		Deviation Factor (Car "A")
120.000	-	115.000	=	5	÷	120.000	=	.042

STEP 3- WEIGHTED CATEGORY SCORE

Each vehicle's weighted category score is determined by multiplying the deviation factor (as determined in Step 2), by the category weight.



*** All mathematical computations are to be rounded to the third decimal place.**

STEP 4 - TOTAL WEIGHTED SCORE

The total weighted score for each vehicle is derived by adding together the six weighted category scores for that vehicle. In the Vehicle Dynamics and Acceleration categories the lowest number is heat. In the remaining categories, the highest category is best.

CAR	30 pts VEH. DYN sec	20 pts ACCEL sec	10 pts BRAKE DECEL f/sec2	20 pts TOP SPEED mph	10 pts ERGO/ COMM. pts	10 pts FUEL ECON. mpg	TOTAL WTD. SCORE
Car "A"	92.210 .018 .540	45.790 .163 3.260	26.380 0 0	115.000 .042 .840	173.900 .184 1.840	14.300 0 0	6.480

STEP 5 - BID ADJUSTMENT FIGURE

The bid adjustment figure we have chosen to use is one percent (1%) of the lowest bid price received. For example, if the lowest bid price received was $9,966.13, the resulting bid adjustment figure is $99.66.

STEP 6 - ACTUAL DOLLAR ADJUSTMENT

The actual dollar adjustment is determined by multiplying the vehicle's total weighted score by the bid adjustment figure as shown at right.

TOTAL WTD. SCORE		BID ADJ. FIGURE		ACTUAL DOLLAR ADJ.
	X		=	
6.480		$ 99.66		$645.80

STEP 7 - ADJUSTED BID PRICE

The adjusted bid price is the sum of the actual dollar adjustment amount and the vehicle's bid price. Provided other necessary approvals are received, the vehicle with the lowest adjusted bid price will be the vehicle purchased. (The amount paid for the purchased vehicles will be the actual bid price.)

ACTUAL DOLLAR ADJ.		ACTUAL BID PRICE		ADJ. BID PRICE
	+		=	
$ 645.80		$10,015.25		$10,661.05

MICHIGAN STATE POLICE

RAW SCORES

CAR MAKE MODEL	30 POINTS VEHICLE DYNAMICS (seconds)	20 POINTS ACCELERATION (seconds)	10 POINTS BRAKING RATE (f/sec^2)	20 POINTS TOP SPEED (mph)	10 POINTS ERGONOMICS & COMMUNICATIONS (points)	10 POINTS FUEL ECONOMY (city epa)
DODGE DIPLOMAT 318-4BBL	89.95	40.53	27.24	116.9	199.9	12.7
FORD CROWN VIC. 351-VV	88.59	39.3	25.66	115.2	193.2	12.9
PLYMOUTH GRAN FURY 318-4BBL	89.77	38.64	27.44	117.5	199.9	12.7
CHEVROLET CAPRICE 350-4BBL	88.32	34.62	26.12	118.0	215.3	13.9

MICHIGAN STATE POLICE

COMPETITIVE PATPOL VEHICLE EVALUATION

CAR MAKE MODEL	30 pts VEH DYN sec	20 pts ACCEL sec	10 pts BRAKE DECEL f/sec2	20 pts TOP SPEED mph	10 pts ERGO/ COMM pts	10 pts FUEL ECON mpg	TOTAL WTD SCORE X	BID ADJ. FIGURE =	ACTUAL DOLLAR ADJ. +	ACTUAL BID PRICE =	ADJ. BID PRICE
FORD	88.59	39.3	25.66	115.2	193.2	12.9					
CROWN VIC.	.003	.135	.065	.024	.103	.072					
351-VV	.090	2.700	.650	.480	1.030	.720	5.670				
PLYMOUTH	89.77	38.64	27.44	117.5	199.9	12.7					
GRAN FURY	.016	.116	0.0	.004	.072	.086					
318-4BBL	.480	2.320	0.0	.080	.720	.860	4.460				
CHEVROLET	88.32	34.62	26.12	118.0	215.3	13.9					
CAPRICE	0.0	0.0	.048	0.0	0.0	0.0					
350-4BBL	0.0	0.0	.480	0.0	0.0	0.0	.480				

APPENDIX A
INFORMATIONAL HARDWARE DESCRIPTION

MAKE	DODGE	**MODEL**	DIPLOMAT	**SALES CODE NO.**	MGL-41
ENGINE DISPLACEMENT	318 CU. IN.		5.2 LITERS		
CARBURETOR	4 BBL			**EXHAUST**	SINGLE
HORSEPOWER (SAE NET)	175 @ 4000 RPM				
TORQUE	250 FT. LBS. @ 3200 RPM				
COMPRESSION RATIO	8.0:1				
AXLE RATIO	2.94:1				
STEERING	POWER - FIRM FEEL (15.7:1 GEAR RATIO)				
TURNING CIRCLE (CURB TO CURB)	40.7 FT.				
TIRE SIZE	P215/70R15				
SUSPENSION TYPE, FRONT	INDEPENDENT, LATERAL, NON-PARALLEL CONTROL ARMS/TRANSVERSE TORTION BARS, HD SHOCKS, ANTI-ROLL BAR				
SUSPENSION TYPE, REAR	SEMI ELLIPTICAL, ASYMETRICAL LEAF SPRINGS,HEAVY DUTY SHOCKS, ANTI-ROLL BAR				
GROUND CLEARANCE, MIN.	6.0 IN. / **LOCATION** EXHAUST CROSSOVER PIPE				
BRAKE, FRONT	**TYPE**	DISC		**SWEPT AREA**	204.5 SQ. IN.
BRAKE, REAR	**TYPE**	DRUM		**SWEPT AREA**	165.9 SQ. IN.
FUEL CAPACITY	18.0 GALLONS		68.1 LITERS		
OVERALL LENGTH	204.6 IN	**TRANSMISSION** MODEL NO. A999 AUTOMATIC 3 SPEED			
OVERALL HEIGHT	55.1 IN.				
TEST WEIGHT	3885 LBS.	LOCK UP TORQUE CONVERTER YES			
WHEELBASE	112.7 IN.	OVERDRIVE NO			
HEAD ROOM	**FRONT**	39.3 IN.		**REAR**	37.7 IN.
LEG ROOM	**FRONT**	42.5 IN. (MAX.)		**REAR**	36.6 IN. (MIN.)
SHOULDER ROOM	**FRONT**	56.0 IN.		**REAR**	55.9 IN.
HIP ROOM	**FRONT**	53.5 IN.		**REAR**	53.2 IN.
INTERIOR VOLUME	**FRONT** **COMB.**	54.1 CU. FT. 98.7 CU. FT.		**REAR** **TRUNK**	44.6 CU. FT. 15.6 CU. FT.
EPA MILEAGE EST. (MPG)	13 CITY	15 HIGHWAY		14 COMBINED	

INFORMATIONAL HARDWARE DESCRIPTION

MAKE FORD	MODEL CROWN VIC.	SALES CODE NO. P73	
ENGINE DISPLACEMENT	351 CU. IN.	5.8 LITERS	
CARBURETOR	VARIABLE VENTURI-VV EED-7200	EXHAUST DUAL	
HORSEPOWER (SAE NET)	180 @ 3600 RPM		
TORQUE	285 FT. LBS. @ 2400 RPM		
COMPRESSION RATIO	8.3:1		
AXLE RATIO	2.73:1		
STEERING	RECIRCULATING BALL AND NUT WITH INTEGRAL POWER (CONSTANT RATIO)		
TURNING CIRCLE (CURB TO CURB)	39.1 FT.		
TIRE SIZE	P225/70R15		
SUSPENSION TYPE, FRONT	INDEPENDENT SLA WITH BALL JOINT AND COIL SPRING		
SUSPENSION TYPE, REAR	FOUR BAR LINK WITH COIL SPRINGS ON AXLE		
GROUND CLEARANCE, MIN.	5.2 IN. / LOCATION BRACKET-RIGHT. SUSP. LOWER ARM		
BRAKE, FRONT	TYPE DISC	SWEPT AREA 228.7 SQ. IN.	
BRAKE, REAR	TYPE DRUM	SWEPT AREA 155.9 SQ. IN.	
FUEL CAPACITY	20.0 GALLONS	75.7 LITERS	
OVERALL LENGTH	211.0 IN.	TRANSMISSION MODEL NO. PKA-AS AUTOMATIC 4 SPEED	
OVERALL HEIGHT	55.3 IN.		
TEST WEIGHT	4079 LBS.	LOCK UP TORQUE CONVERTER YES	
WHEELBASE	114.3 IN.	OVERDRIVE YES	
HEAD ROOM	FRONT 37.9 IN.	REAR 37.2 IN.	
LEG ROOM	FRONT 43.5 IN. (MAX.)	REAR 39.3 IN. (MIN.)	
SHOULDER ROOM	FRONT 61.6 IN.	REAR 61.6 IN.	
HIP ROOM	FRONT 61.0 IN.	REAR 56.9 IN.	
INTERIOR VOLUME	FRONT 57.0 CU. FT. COMB. 111.0 CU. FT.	REAR 54.0 CU. FT. TRUNK 21.4 CU. FT.	
EPA MILEAGE EST. (MPG)	13* CITY	18* HIGHWAY	15* COMBINED

* NOT CERTIFIED BY E.P.A. AT TIME OF PUBLICATION

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	PLYMOUTH	MODEL	GRAN FURY	SALES CODE NO.	MBL-41
ENGINE DISPLACEMENT		318 CU. IN.		5.2 LITERS	
CARBURETOR		4 BBL		EXHAUST	SINGLE
HORSEPOWER (SAE NET)		175 @ 4000 RPM			
TORQUE		250 FT. LBS. @ 3200 RPM			
COMPRESSION RATIO		8.0:1			
AXLE RATIO		2.94:1			
STEERING		POWER - FIRM FEEL (15.7:1 GEAR RATIO)			
TURNING CIRCLE (CURB TO CURB)		40.7 FT.			
TIRE SIZE		P215/70R15			
SUSPENSION TYPE, FRONT		INDEPENDENT, LATERAL, NON-PARALLEL CONTROL ARMS/TRANVERSE TORTION BARS, HD SHOCKS, ANTI-ROLL BAR			
SUSPENSION TYPE, REAR		SEMI ELLIPTICAL, ASYMETRICAL LEAF SPRINGS,HEAVY DUTY SHOCKS, ANTI-ROLL BAR			
GROUND CLEARANCE, MIN.		6.0 IN. / LOCATION	EXHAUST CROSSOVER PIPE		
BRAKE, FRONT		TYPE	DISC	SWEPT AREA	204.5 SQ. IN.
BRAKE, REAR		TYPE	DRUM	SWEPT AREA	165.9 SQ. IN.
FUEL CAPACITY		18.0 GALLONS		68.1 LITERS	
OVERALL LENGTH		204.6 IN.		TRANSMISSION	
OVERALL HEIGHT		55.1 IN.		MODEL NO. A999 AUTOMATIC 3 SPEED	
TEST WEIGHT		3924 LBS.		LOCK UP TORQUE CONVERTER	YES
WHEELBASE		112.7 IN.		OVERDRIVE	NO
HEAD ROOM		FRONT	39.3 IN.	REAR	37.7 IN.
LEG ROOM		FRONT	42.5 IN. (MAX.)	REAR	36.6 IN. (MIN.)
SHOULDER ROOM		FRONT	56.0 IN.	REAR	55.9 IN.
HIP ROOM		FRONT	53.5 IN.	REAR	53.2 IN.
INTERIOR VOLUME		FRONT COMB.	54.1 CU. FT. 98.7 CU. FT.	REAR TRUNK	44.6 CU. FT. 15.6 CU. FT.
EPA MILEAGE EST. (MPG)		13 CITY		15 HIGHWAY	14 COMBINED

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	CHEVROLET	MODEL	CAPRICE	SALES CODE NO.	1BL69
ENGINE DISPLACEMENT		350 CU. IN.		5.7 LITERS	
CARBURETOR		4 BBL		EXHAUST	SINGLE
HORSEPOWER (SAE NET)		180 @ 4000 RPM			
TORQUE		285 FT. LBS. @ 2400 RPM			
COMPRESSION RATIO		8.6:1			
AXLE RATIO		3.08:1			
STEERING		POWER, INTEGRAL, RECIRCULATING BALL NUT			
TURNING CIRCLE (CURB TO CURB)		38.7 FT.			
TIRE SIZE		P225/70R15			
SUSPENSION TYPE, FRONT		INDEPENDENT, SLA TYPE WITH COIL SPRINGS			
SUSPENSION TYPE, REAR		LINK TYPE, 2 UPPER AND 2 LOWER COIL SPRINGS			
GROUND CLEARANCE, MIN.		5.8 IN. / LOCATION		FRONT SUSPENSION	
BRAKE, FRONT		TYPE	DISC	SWEPT AREA	273.0 SQ. IN.
BRAKE, REAR		TYPE	DRUM	SWEPT AREA	138.2 SQ. IN.
FUEL CAPACITY		25.0 GALLONS		94.6 LITERS	
OVERALL LENGTH		212.2 IN.			
OVERALL HEIGHT		56.4 IN.			
TEST WEIGHT		3948 LBS.			
WHEELBASE		116.0 IN.			
HEAD ROOM		FRONT	39.5 IN.	REAR	38.2 IN.
LEG ROOM		FRONT	42.2 IN. (MAX.)	REAR	39.1 IN. (MIN.)
SHOULDER ROOM		FRONT	60.5 IN.	REAR	60.5 IN.
HIP ROOM		FRONT	55.0 IN.	REAR	55.3 IN.
INTERIOR VOLUME		FRONT	58.1 CU. FT.	REAR	52.2 CU. FT.
		COMB.	110.3 CU. FT.	TRUNK	20.9 CU. FT.
EPA MILEAGE EST. (MPG)	14* CITY	20* HIGHWAY		16* COMBINED	

TRANSMISSION
MODEL NO. 700R4
AUTOMATIC 4 SPEED

LOCK UP TORQUE CONVERTER YES

OVERDRIVE YES

*** NOT CERTIFIED BY E.P.A. AT TIME OF PUBLICATION**

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	FORD	**MODEL**	MUSTANG	**SALES CODE NO.**	P40
ENGINE DISPLACEMENT	302 CU. IN.		5.0 LITERS		
CARBURETOR	MULTI PORT FUEL INJECTION (PFI)		**EXHAUST**	SINGLE-1 CONVERTER, 2 MUFFLERS & 2 PIPES	
HORSEPOWER (SAE NET)	225 @ 4000 RPM				
TORQUE	300 FT. LBS. @ 3200 RPM				
COMPRESSION RATIO	9.2:1				
AXLE RATIO	2.73:1				
STEERING	RACK AND PINION WITH INCREASED EFFORT				
TURNING CIRCLE (CURB TO CURB)	37.4 FT.				
TIRE SIZE	P225/60R15				
SUSPENSION TYPE, FRONT	HYBRID MACPHERSON STRUT WITH SPRING MOUNTED ON LOWER ARM				
SUSPENSION TYPE, REAR	FOUR BAR LINK WITH QUADRA SHOCKS				
GROUND CLEARANCE, MIN.	4.5 IN. / **LOCATION**		CONVERTER GRASS SHIELD		
BRAKE, FRONT	**TYPE**	DISC		**SWEPT AREA**	217.0 SQ. IN.
BRAKE, REAR	**TYPE**	DRUM		**SWEPT AREA**	99.0 SQ. IN.
FUEL CAPACITY	15.4 GALLONS		58.3 LITERS		
OVERALL LENGTH	179.6 IN.		**TRANSMISSION** MODEL NO. PKA-CY AUTOMATIC 4 SPEED		
OVERALL HEIGHT	52.1 IN.				
TEST WEIGHT	3270 LBS.		LOCK UP TORQUE CONVERTER		YES
WHEELBASE	100.5 IN.		OVERDRIVE		YES
HEAD ROOM	**FRONT**	37.0 IN.		**REAR**	35.9 IN.
LEG ROOM	**FRONT**	41.7 IN. (MAX.)		**REAR**	30.7 IN. (MIN.)
SHOULDER ROOM	**FRONT**	55.4 IN.		**REAR**	54.3 IN.
HIP ROOM	**FRONT**	56.1 IN.		**REAR**	47.1 IN.
INTERIOR VOLUME	**FRONT COMB.**	50.0 CU. FT. 84.0 CU. FT.		**REAR TRUNK**	34.0 CU. FT. 10.0 CU. FT.
EPA MILEAGE EST. (MPG)	18 CITY	27 HIGHWAY		21 COMBINED	

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	FORD	**MODEL**	MUSTANG	**SALES CODE NO.**	P40
ENGINE DISPLACEMENT	302 CU. IN.		5.0 LITERS		
CARBURETOR	MULTI PORT FUEL INJECTION (PFI)		**EXHAUST** SINGLE-1 CONVERTER, 2 MUFFLERS & 2 PIPES		
HORSEPOWER (SAE NET)	225 @ 4200 RPM				
TORQUE	300 FT. LBS. @ 3200 RPM				
COMPRESSION RATIO	9.2:1				
AXLE RATIO	3.08:1				
STEERING	RACK AND PINION WITH INCREASED EFFORT				
TURNING CIRCLE (CURB TO CURB)	37.4 FT.				
TIRE SIZE	P225/60R15				
SUSPENSION TYPE, FRONT	HYBRID MACPHERSON STRUT WITH SPRING MOUNTED ON LOWER ARM				
SUSPENSION TYPE, REAR	FOUR BAR LINK WITH QUADRA SHOCKS				
GROUND CLEARANCE, MIN.	4.5 IN. / **LOCATION** CONVERTER GRASS SHIELD				
BRAKE, FRONT	**TYPE**	DISC	**SWEPT AREA**	217.0 SQ. IN.	
BRAKE, REAR	**TYPE**	DRUM	**SWEPT AREA**	99.0 SQ. IN.	
FUEL CAPACITY	15.4 GALLONS		58.3 LITERS		
OVERALL LENGTH	179.6 IN.	**TRANSMISSION** MODEL NO. REP-AK MANUAL 5 SPEED			
OVERALL HEIGHT	52.1 IN.				
TEST WEIGHT	3198 LBS.	LOCK UP TORQUE CONVERTER N/A			
WHEELBASE	100.5 IN.	OVERDRIVE YES			
HEAD ROOM	**FRONT**	37.0 IN.	**REAR**	35.9 IN.	
LEG ROOM	**FRONT**	41.7 IN. (MAX.)	**REAR**	30.7 IN. (MIN.)	
SHOULDER ROOM	**FRONT**	55.4 IN.	**REAR**	54.3 IN.	
HIP ROOM	**FRONT**	56.1 IN.	**REAR**	47.1 IN.	
INTERIOR VOLUME	**FRONT COMB.**	50.0 CU. FT. 84.0 CU. FT.	**REAR TRUNK**	34.0 CU . FT. 10.0 CU. FT.	
EPA MILEAGE EST. (MPG)	16* CITY	25* HIGHWAY	19* COMBINED		

*** NOT CERTIFIED BY E.P.A. AT TIME OF PUBLICATION**

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	CHEVROLET	**MODEL**	CAPRICE	**SALES CODE NO.**	1BL69
ENGINE DISPLACEMENT		262 CU. IN.		4.3 LITERS	
CARBURETOR		THROTTLE BODY INJECTION (TBI)		**EXHAUST**	SINGLE
HORSEPOWER (SAE NET)		140 @ 4200 RPM			
TORQUE		225 FT. LBS. @ 2000 RPM			
COMPRESSION RATIO		9.3:1			
AXLE RATIO		3.08:1			
STEERING		POWER, INTEGRAL, RECIRCULATING BALL NUT			
TURNING CIRCLE (CURB TO CURB)		38.7 FT.			
TIRE SIZE		P225/70R15			
SUSPENSION TYPE, FRONT		INDEPENDENT, SLA TYPE WITH COIL SPRINGS			
SUSPENSION TYPE, REAR		LINK TYPE, 2 UPPER AND 2 LOWER WITH COIL SPRINGS			
GROUND CLEARANCE, MIN.		5.8 IN. / **LOCATION**		FRONT SUSPENSION	
BRAKE, FRONT		**TYPE**	DISC	**SWEPT AREA**	273.0 SQ. IN.
BRAKE, REAR		**TYPE**	DRUM	**SWEPT AREA**	138.2 SQ. IN.
FUEL CAPACITY		25.0 GALLONS		94.6 LITERS	
OVERALL LENGTH		212.2 IN.		**TRANSMISSION** MODEL NO. 700R4 AUTOMATIC 4 SPEED	
OVERALL HEIGHT		56.4 IN.			
TEST WEIGHT		3803 LBS.		LOCK UP TORQUE CONVERTER	YES
WHEEL BASE		116.0 IN.		OVERDRIVE	YES
HEAD ROOM		**FRONT**	39.5 IN.	**REAR**	38.2 IN.
LEG ROOM		**FRONT**	42.2 IN. (MAX.)	**REAR**	39.1 IN. (MIN.)
SHOULDER ROOM		**FRONT**	60.5 IN.	**REAR**	60.5 IN.
HIP ROOM		**FRONT**	55.0 IN.	**REAR**	55.3 IN.
INTERIOR VOLUME		**FRONT**	58.1 CU. FT.	**REAR**	52.2 CU. FT.
		COMB.	110.3 CU. FT.	**TRUNK**	20.9 CU. FT.
EPA MILEAGE EST. (MPG)		18* CITY		27* HIGHWAY	21* COMBINED

*** NOT CERTIFIED BY E.P.A. AT TIME OF PUBLICATION**

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	PLYMOUTH	MODEL	GRAN FURY	SALES CODE NO.	MBL-41
ENGINE DISPLACEMENT		318 CU. IN.		5.2 LITERS	
CARBURETOR		2 BBL		EXHAUST SINGLE	
HORSEPOWER (SAE NET)		140 @ 3600 RPM			
TORQUE		265 FT. LBS. @ 2000 RPM			
COMPRESSION RATIO		9.0:1			
AXLE RATIO		2.26:1			
STEERING		POWER - FIRM FEEL (15.7:1 GEAR RATIO)			
TURNING CIRCLE(CURB TO CURB)		40.7 FT.			
TIRE SIZE		P215/70R15			
SUSPENSION TYPE, FRONT		INDEPENDENT, LATERAL, NON-PARALLEL CONTROL ARMS/TRANSVERSE TORTION BARS, HD SHOCKS, ANTI-ROLL BAR			
SUSPENSION TYPE, REAR		SEMI ELLIPTICAL, ASYMETRICAL LEAF SPRINGS,HEAVY DUTY SHOCKS, ANTI-ROLL BAR			
GROUND CLEARANCE, MIN.		6.0 IN. / LOCATION EXHAUST CROSSOVER PIPE			
BRAKE, FRONT		TYPE	DISC	SWEPT AREA	204.5 SQ. IN.
BRAKE, REAR		TYPE	DRUM	SWEPT AREA	165.9 SQ. IN.
FUEL CAPACITY		18.0 GALLONS		68.1 LITERS	
OVERALL LENGTH		204.6 IN.		TRANSMISSION	
OVERALL HEIGHT		55.1 IN.		MODEL NO. A727 AUTOMATIC 3 SPEED	
TEST WEIGHT		3895 LBS.		LOCK UP TORQUE CONVERTER	YES
WHEELBASE		112.7 IN.		OVERDRIVE	NO
HEAD ROOM		FRONT	39.3 IN.	REAR	37.7 IN.
LEG ROOM		FRONT	42.5 IN. (MAX.)	REAR	36.6 IN. (MIN.)
SHOULDER ROOM		FRONT	56.0 IN.	REAR	55.9 IN.
HIP ROOM		FRONT	53.5 IN.	REAR	53.2 IN.
INTERIOR VOLUME		FRONT COMB.	54.1 CU. FT. 98.7 CU. FT.	REAR TRUNK	44.6 CU. FT. 15.6 CU. FT.
EPA MILEAGE EST. (MPG)		15	CITY	17 HIGHWAY	16 COMBINED

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	FORD	**MODEL**	CROWN VIC.	**SALES CODE NO.**	P73
ENGINE DISPLACEMENT		302 CU. IN.		5.0 LITERS	
CARBURETOR		MULTI PORT FUEL INJECTION (PFI)		**EXHAUST**	DUAL
HORSEPOWER (SAE NET)		160 @ 3400 RPM			
TORQUE		280 FT. LBS. @ 2200 RPM			
COMPRESSION RATIO		8.9:1			
AXLE RATIO		3.08:1			
STEERING		RECIRCULATING BALL AND NUT WITH INTEGRAL POWER (CONSTANT RATIO)			
TURNING CIRCLE (CURB TO CURB)		39.1 FT.			
TIRE SIZE		P225/70R15			
SUSPENSION TYPE, FRONT		INDEPENDENT SLA WITH BALL JOINT AND COIL SPRING			
SUSPENSION TYPE, REAR		FOUR BAR LINK WITH COIL SPRINGS ON AXLE			
GROUND CLEARANCE, MIN.		5.2 IN. / **LOCATION** BRACKET-RIGHT. SUSP. LOWER ARM			
BRAKE, FRONT		**TYPE**	DISC	**SWEPT AREA**	228.7 SQ. IN.
BRAKE, REAR		**TYPE**	DRUM	**SWEPT AREA**	155.9 SQ. IN.
FUEL CAPACITY		18.0 GALLONS		68.1 LITERS	
OVERALL LENGTH		211.0 IN.		**TRANSMISSION** MODEL NO. PKA-CN AUTOMATIC 4 SPEED	
OVERALL HEIGHT		55.3 IN.			
TEST WEIGHT		4051 LBS.		LOCK UP TORQUE CONVERTER	YES
WHEELBASE		114.3 IN.		OVERDRIVE	YES
HEAD ROOM		**FRONT**	37.9 IN.	**REAR**	37.2 IN.
LEG ROOM		**FRONT**	43.5 IN. (MAX.)	**REAR**	39.3 IN. (MIN.)
SHOULDER ROOM		**FRONT**	61.6 IN.	**REAR**	61.6 IN.
HIP ROOM		**FRONT**	61.0 IN.	**REAR**	56.9 IN.
INTERIOR VOLUME		**FRONT** 57.0 CU. FT. **COMB.** 111.0 CU. FT.		**REAR** 54.0 CU. FT. **TRUNK** 21.4 CU. FT.	
EPA MILEAGE EST. (MPG)		17	CITY	27 HIGHWAY	21 COMBINED

INFORMATIONAL HARDWARE DESCRIPTION

MAKE	PLYMOUTH	MODEL	RELIANT	SALES CODE NO.	KPL-41
ENGINE DISPLACEMENT		153 CU. IN.		2.5 LITERS	
CARBURETOR		THROTTLE BODY INJECTION (TBI)		EXHAUST	SINGLE
HORSEPOWER (SAE NET)		100 @ 4800 RPM			
TORQUE		133 FT. LBS. @ 2800 RPM			
COMPRESSION RATIO		9.0:1			
AXLE RATIO		3.22:1			
STEERING		POWER - RACK AND PINION, FIRM FEEL (14:1 GEAR RATIO)			
TURNING CIRCLE (CURB TO CURB)		35.2 FT.			
TIRE SIZE		P185/70R14			
SUSPENSION TYPE, FRONT		INDEPENDENT, HEAVY DUTY, ISO-STRUT WITH ANTI-ROLL BAR			
SUSPENSION TYPE, REAR		TRAILING ARM AXLE WITH INTEGRAL ANTI-ROLL BAR, TRACK BAR, HD COIL SPRINGS & SHOCK ABSORBERS			
GROUND CLEARANCE, MIN.		4.6 IN. / LOCATION FRONT SUSP. "C" MEMBER BRACKET			
BRAKE, FRONT		TYPE	DISC	SWEPT AREA	197.8 SQ. IN.
BRAKE, REAR		TYPE	DRUM	SWEPT AREA	85.2 SQ. IN.
FUEL CAPACITY		14.0 GALLONS		53.0 LITERS	
OVERALL LENGTH		178.6 IN.		TRANSMISSION	
OVERALL HEIGHT		52.9 IN.		MODEL NO. A949 AUTOMATIC 3 SPEED	
TEST WEIGHT		2712 LBS.		LOCK UP TORQUE CONVERTER	YES
WHEELBASE		100.3 IN.		OVERDRIVE	NO
HEAD ROOM		FRONT	38.6 IN.	REAR	37.8 IN.
LEG ROOM		FRONT	42.2 IN. (MAX.)	REAR	35.4 IN. (MIN.)
SHOULDER ROOM		FRONT	55.4 IN.	REAR	55.9 IN.
HIP ROOM		FRONT	55.6 IN.	REAR	56.3 IN.
INTERIOR VOLUME		FRONT COMB.	52.2 CU. FT. 95.5 CU. FT.	REAR TRUNK	43.3 CU. FT. 15.0 CU. FT.
EPA MILEAGE EST. (MPG)		21	CITY	26 HIGHWAY	23 COMBINED

INFORMATIONAL HARDWARE DESCRIPTION SUMMARY

MAKE MODEL	DODGE DIPLOMAT	FORD CROWN VIC	PLYMOUTH GRAN FURY	CHEVROLET CAPRICE
ENGINE DISPLACEMENT - CU. IN.	318	351	318	350
ENGINE DISPLACEMENT - LITERS	5.2	5.8	5.2	5.7
ENGINE FUEL SYSTEM	4BBL	VV	4BBL	4BBL
HORSEPOWER (SAE NET)	175	180	175	180
TORQUE - FT-LBS	250	285	250	285
COMPRESSION RATIO	8.0:1	8.3:1	8.0:1	8.6:1
AXLE RATIO	2.94:1	2.73:1	2.94:1	3.08:1
TURNING CIRCLE (CURB TO CURB)	40.7	39.1	40.7	38.7
TRANSMISSION	AUTOMATIC	AUTOMATIC	AUTOMATIC	AUTOMATIC
TRANSMISSION MODEL NUMBER	A999	PKA-AS	A999	700R4
LOCK UP TORQUE CONVERTER	YES	YES	YES	YES
TRANSMISSION OVERDRIVE	NO	YES	NO	YES
TIRE SIZE	P215/70	P225/70	P215/70	P225/70
RIM SIZE	15	15	15	15
GROUND CLEARANCE - INCHES - MIN	6.0	5.2	6.0	5.8
BRAKE - FRONT TYPE	DISC	DISC	DISC	DISC
BRAKE - REAR TYPE	DRUM	DRUM	DRUM	DRUM
FUEL CAPACITY - GALLONS	18	20	18	25
FUEL CAPACITY - LITERS	68.1	75.7	68.1	94.6
OVERALL LENGTH - INCHES	204.6	211	204.6	212.2
OVERALL HEIGHT - INCHES	55.1	55.3	55.1	56.4
WEIGHT - TEST	3885	4079	3924	3948
WHEELBASE - INCHES	112.7	114.3	112.7	116.0
HEAD ROOM - FRONT - INCHES	39.3	37.9	39.3	39.5
HEAD ROOM - REAR - INCHES	37.7	37.2	37.7	38.2
LEG ROOM - FRONT - INCHES - MAX	42.5	43.5	42.5	42.2
LEG ROOM - REAR - INCHES - MIN	36.6	39.3	36.6	39.1
SHOULDER ROOM - FRONT - INCHES	56.0	61.6	56.0	60.5
SHOULDER ROOM - REAR - INCHES	55.9	61.6	55.9	60.5
HIP ROOM - FRONT - INCHES	53.5	61.0	53.5	55.0
HIP ROOM - REAR - INCHES	53.2	56.9	53.2	55.3
INTERIOR VOLUME - FRONT - CU. FT.	54.1	57	54.1	58.1
INTERIOR VOLUME - REAR - CU. FT.	44.6	54	44.6	52.2
INTERIOR VOLUME - COMB - CU. FT.	98.7	111	98.7	110.3
TRUNK VOLUME - CU. FT.	15.6	21.4	15.6	20.9
E.P.A. MILEAGE - CITY	13	13	13	14
E.P.A. MILEAGE - HIGHWAY	15	18	15	20
E.P.A. MILEAGE - COMBINED	14	15	14	16