POLICE TEST THE 66s

CHEVROLET DODGE
FORD OLDSMOBILE
PLYMOUTH

Are you faced with the problem of choosing a new car? Do you want to be sure you are getting the vehicle best-suited to your needs, one which delivers the most value for the money? Are you pre-eminently concerned with both safety and performance and highly conscious of the problems of serviceability and durability? Is yours a position of trust where you are using someone else's money for the purchase?

If so, you are in a spot which duplicates that of the procurement officers of the country's law enforcement agencies, except, of course, that they purchase as many as several hundred cars at a time and must buy again each model year.

How do these buyers satisfy their requirements? What procedures do they use to analyze the vehicles offered? How do the various makes stand up and what do the findings of these agencies mean to the average car owner?

The methods used by the Los Angeles City Police and County Sheriff's Departments are outstanding examples of a conscientious approach to the problem which goes much deeper than merely selecting the low bid as was once the case.

"Permanently pensioning a young policeman could cost the Department $150,000" says Ray Wynne, Transportation Superintendent, "So we have to put him in the best possible vehicle for what is essentially hazardous duty . . . even if he never encounters a criminal with a gun."

This "best possible vehicle' 'is admittedly hard to define and difficult to evaluate. But, to satisfy themselves that some high standards are met, these departments run the cars offered to them through stringent road tests after first specifying many chassis and drive train components that must be included. Only those models which pass the tests are acceptable for bid submission. The modifications the police have found necessary are interesting in themselves and the test procedure is notable in that it reveals weaknesses which the manufacturers' proving grounds fail to disclose.

INTERIOR APPOINTMENTS

In addition to numerous "heavy duty" upholstery items specified to withstand constant abuse, the interior requirements include a full-circle or semi-circle hornring; seats to be secured to the floor so that they will not come loose in collisions; emergency brake warning lights and non-glare paint on the dashboard. Current factory-installed seat belts are not acceptable for police service. These departments prefer to install shoulder-and-belt harnesses in all "Freeway" patrol cars and metal-to-webbing buckle lap belts in the others. Seat belts have been used for five years and Wynne says that many times after an officer has an accident while wearing a seat belt, he will ask for a shoulder harness. As to the value of the shoulder harness, Wynne says that this device almost insures that the driver will not be in a state of shock after the accident and thus be better able to take care of

himself in the ensuing emergency situation. "We've never had a man even miss a day's work after an accident in which he was wearing the shoulder harness," says Wynne.

Several other items in the General Service Administration's "safety package" which were adopted by manufacturers for inclusion as standard equipment for 1966 do not suit these departments' needs, particularly the mounted outside mirror which is placed too close to the driver and requires too-great an eye or head movement. These departments are happy to see a concern for safety equipment being brought home to Detroit, however, inasmuch as the inclusion of them on all cars can make purchasing easier. Not all vehicles are "black and white" cars or "pursuit" machines. Hundreds of plainclothes vehicles are in service and they should be indistinguishable from any other car on the street. Heavy duty suspension and brakes make them different to a certain degree, however.

TIRES, BRAKES & STEERING

Four-ply rated, two-ply tires won't get the job done as far as these departments are concerned and neither will the "heavy-duty red-line" type of tire which is being sold with the sporty, big-engined intermediate size cars. This is largely because the suspension necessary for good handling requires a maximum sidewall strength tire. Tire pressures of 35 psi are employed and it takes rugged rubber to satisfy the requirements. "Freeway" cars must be equipped with 126-level tires, nothing less.

The brakes must be the largest size available for the vehicle and manually adjustable. If self-adjusting mechanism is employed it must be made inoperable without lessening brake efficiency. Moreover, brakes must pass a stringent use test which is the final arbiter regardless of design. Power brakes are not acceptable to these departments. Disc brakes, which must be power assisted, have, for this reason, not been considered. Likewise, power steeering is taboo. Instead the fastest-ratio manual steering available must be fitted.

One reason for deleting the power equipment is to lessen the chances of mechanical failure in an emergency. Another is that these devices add a few pounds to the already too-heavy front end, as far as this handling-conscious group is concerned. However, the biggest factor is undoubtedly that this makes two fewer items which call for service and the ministrations of an expert. Keeping the cars on the road with as few garage-hours as possible is a goal to be kept in sight at all times.

A simple service procedure, one that can be followed by a mechanic working on several different makes and models on each shift, is necessary. This has led to one of the unusual specifications: all cars bought by the Los Angeles Police (for use in City limits only) must have automatic transmissions which will perform to the full extent of regular warranty using

SAE 20 lubricating oil (2140A-Series #1) rather than automatic transmission fluid.

This concept, developed by the L.A.P.D., has been highly successful. Since started, there have been no transmission failures or malfunctions. The lubricant is drained and changed every 9,000 miles and any time the car have been involved in an all-out high speed chase.

The department cars are serviced routinely every 3,000 miles. This is "over-service, as far as a civilian car would be concerned," Wynne believes, "but it pays off in few field problems."

THE TEST PROGRAM

The goal of fewer field problems is largely responsible for the character of the test program.

Brakes, (or bad brakes, to put it more accurately) were the major item which caused cars be so exhaustively tested. Brakes on cars bought by the department in 1956 were so inadequate and caused so many problems that the whole automobile came under severe scrutiny.

A brake test was devised and its severity was increased until complains from field officer stopped. The test now consists of four 90 mph stops at 20 ft./sec^2 rate of deceleration plus a 60 mph full panic stop, all at two minute intervals. After a five minute wait the cycle is repeated. Problems are often encountered when cars are equipped with standard organic lining of the heavy duty type. Metallic linings seem to be the answer and these linings are presently in use on L.A.P.D. high performance vehicles. However, linings alone will not do the job. These departments will not pass a car which suffers from rear axle hop. So, suspension must also be revamped to provide the control necessary for severe brake applications.

About ten years ago, it became apparent that the so-called "Emergency Vehicles" which were offered to police were not conspicuously better than production cars and for a time the Los Angeles departments had their automobiles specially modified. Now, manufacturers are anxious to conform to the specifications and be in on the eventual bidding to supply cars for the 1200-odd vehicle fleet. Consequently, the manufacturers make repeated changes on the cars submitted for testing in order to make them pass the requirements.

"The object of the tests is not to fail cars," says Wynne, "and we will re-test automobiles as long as our time permits."

Outstanding evidence of the results of suspension and chassis changes can be found in the slow-motion movies which fully document every yearly test program. In these scenes, the effects of stiffer springs, heavier shocks or stiffer anti-sway bars on the handling and controllability of the vehicles is crystal clear.

"The reason we have to re-test every model year," Wynne says, "is because the manufacturers make production line changes on the chassis which have

an effect on our 'special package' cars, even though they may not realize it. We found considerable difference in performance between the 1965 and 1966 cars although the AMA specifications don't reveal the cause."

HOW ARE THE 1966 CARS?

Five major manufacturers submitted vehicles conforming to the basic requirements for the 1966 test program: Ford, Chevrolet, Plymouth, Dodge and Oldsmobile.

In addition to the braking tests mentioned, the cars were evaluated by four experienced drivers from the two departments on the basis of roadability and performance. This test takes place at the Los Angeles County Fairgrounds at Pomona where a frequently-used sports car track is laid out in the vast parking lot. The two-mile course offers all types of turns generally found on roads in the area and its surface is quite similar to the local paving.

The ability and consistency of the drivers is noteworthy. Lap time variations for all were only around .6 of a second and average speeds were within 3 miles per hour in a given car. This proficiency is the result of a year of training and over 500 miles of high speed driving before becoming part of the test staff . . . and their evaluations are given considerable weight.

ROAD TEST staff members witnessed this year's tests and were impressed both with the methods and the results. Our observations on the cars to follow must be read with an important thought in mind, however: These are not showroom stock cars, they are submitted as special service vehicles. Moreover, the trials are not held to eliminate all but one car; it is not a process of elimination. In fact most cars tested eventually pass. The tests are performed so that a good Police car can be found. As Ray Wynne says, "The most satisfactory by-product of these tests is the advanced police vehicle design we now enjoy."

PLYMOUTH

The Plymouth Belvedere with 383 cubic inch engine (330 hp) failed its first braking test with locking rear wheels and finally a blown tire on the fourth "warm up" stop from 90 mph. Also on its initial roadability evaluation, the driver found brake chatter. The second driver discovered a loose right front wheel, and a right rear grease seal failed after two laps of the road course.

The second brake test went a little better but the car still failed to make the grade on the basis of wheel hop during the first panic stop.

After further brake and suspension modifications (stiffer springs and torsion bars) the car passed the roadability and brake test with flying colors . . . with only slightly high pedal pressure in the brake test.

On the second roadability test, considerable leaning (body roll) could be observed but front adhesion and tracking appeared to be excellent. Some rear-end drift was noted but it appeared to be easily control-

lable. Horsepower was evidently satisfactory for general police requirements.

Best average lap speed for this car was 83.07 mph with 82.77 as the everage for all drivers.

OLDSMOBILE

Oldsmobile, having furnished the department with some cars the previous year used the same Moraine metallic lining and suspension on the 330 cubic inch, 320 hp F-85 submitted in 1966 and it passed the brake test in good shape. However lap speeds were down by 3 mph from 1965. It was felt by the staff without any other evidence that this may have been largely dué to the State of California-required anti-smog device (exhaust emission control) on the engine.

It was also noted that the valves floated at about 65 mph in low gear and when shifted into high range at 65, the car didn't seen to accelerate as fast as the '65. Transmission ratios appear to be too widely spaced for best results and a lack of acceleration at 100 mph and up was evident. However, handling was excellent, the car was stable in corners and the overall evaluation was good.

The location of the Olds speedometer, door handles and lack of instruments were items of possible criticism for this kind of application, but its other features appear to be satisfactory.

Best average lap speed was 82.17 mph and 79.57 was the slowest, for an overall average of 80.54.

The big Oldsmobile 88, with 425 cubic inch, 370 hp engine, was not surprisingly faster than the intermediate cars tested as far as average lap speeds and times are concerned. This was due in some measure to the length of the test circuit. On the open highway the 88 would come more into its own environment. Two of the testers were critical of some aspects of the 88's handling. But, in the overall picture, it rated considerable enthusiasm. The suspension package used is caled B.O.-7 by Olds, incidentally.

While under hard cornering the 88 remained level but with considerable oversteer causing the rear end to be a little slippery. Other than this characteristic, the vehicle appeared to be excellent. The gear ratios in relation to engine output seemed to be well chosen and the Olds seemed to handle itself well for a big car. Brakes, in particular, were noted to be excellent.

Aside from the comment that this car, too, needs gages instead of warning lights, the interior appointments and room were rated as good.

Average lap speeds included one driver's 84 mph. The slowest was 80.32 with an average for all drivers at 82.17.

CHEVROLET

The Chevrolet Biscayne with 396 cubic inch, 325 horsepower engine actually got around the track under the hands of one driver as fast as the Olds 88 with an identical lap average of 84 mph. But, the average for all drivers was down somewhat, to 81.44, and one tester spun the car off the course during his laps.

All observers commented on the excellent brakes (Moraine metallic) which exhibited consistently minimum required pedal pressures and straight, smooth stopping power. Another comment from all was the improvement noted over previous Chevrolets submitted for testing. The front end suspension has been improved greatly as compared to former years. The car oversteers slightly and its back end swings out moderately but seems relatively easy to control. The Chevy does not roll in turns as in previous years and is acceptable as patrol car.

This change from earlier examples submitted is credited to Chevy engineers who have been pressed by the fleet sales department to come up with suspension packages which will pass the L.A. police tests.

DODGE

Dodge, perennially at the tests and suppliers of many cars to the department, submitted a 383 cubic inch, 330 horsepower Coronet basically like the Plymouth but with enough differences in performance to make it clear that the cars come from different divisions of the Chrysler Corp.

They were alike in respect to braking problems, but the Dodge passed on the first round, albeit with several comments about chatter and lock up. The car didn't get by on its handling, however. During the first driver's test the right front wheel lug bolts became loosened. Then during the second driver's four laps, the wheel came off. This condition, together with the excessive smoking of front tires which could be observed at trackside, indicated that the suspension was not working properly and that high loading was being shifted to wheels and tires.

This failure caused Dodge to revise its suspension and another series of tests was conducted. This time, erratic brakes caused a rejection and a third series was necessary to finally establish an accepable performance pattern.

With the right combination, however, the Coronet was approved. Some staff comments were: "Appears to handle very satisfactorily with the exception that it understeers in some turns." "Corners well on sharp turns but tends to go into understeering condition on long turns" . . . "Shock absorber rate and steering ratio appear to be good" . . . Engine evidently produces ample power" . . . "Brakes were excellent" . . . Carburetion good, no starving in turns."

Average lap speeds were 83.07, 82.17 and two drivers matched at 80.32 mph for an overall average of 81.47.

FORD

Ford, whose cars were acceptable in 1965, did not get past the first time. The car understeered badly and was exteremely hard on tires. And, although several modifications were made, the vehicles were not brought up to the standards during the time when tests were conducted and Ford engineers went back to work. Observers commented that the basic problem seemed to be in chassis design and noted that this was the fifth frame or chassis revision tested since the advent of the perimeter frame. With new suspension the Ford has now passed satisfactorily, we are told.

PRODUCES BETTER VEHICLES

The test program certainly produced better vehicles for the department's use and it clearly indicates that there is a gap somewhere both in the bastion of proving ground testing and the defense of "total-performance' 'improvement through racing. It would seem that the repeated suspension and brake revisions would be wholly unnecessary coming from a racing-oriented organization or one whose engineering and proving facilities are so staggering in size and scope. Only Oldsmobile seemed to be wholly prepared with the right combination the first shot.

At any rate, the vehicles are improved, the parts are now in the catalogs and, hopefully, some of the knowledge patiently compiled by the Los Angeles law enforcement agencies will be applied to building better handling, safer cars for thee and me.