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The Missing Link.

Until now, there were two distinct types of stock cars.

There was the street stock. And, indeed, it was just that. Despite the acquisition of big-displacement engines and ferocious nicknames, it was basically a boulevard car. The emphasis was on luxury: expensive interiors, lavish adornments, and lots of brightwork.

Then there was the other type—the Grand National stocker. You couldn't buy it, and even if you could, your name would have to be Petty or something to get it started on a cold morning.

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Obviously there was a need for a car that combined some of the civilized comforts of the street stock with the integrity of the Grand National type.

So we created the Missing Link. It's called the Road Runner, and you'd better believe it's one hairy-idling, stiffly-sprung, squat-sitting, wide-tired, de-chromed automobile.

Unlike most stocks, Road Runner doesn't sport an interior of hand-rubbed, fake Ukembeki wood. It doesn't even have Buck Rogers signature-model seats. Like a real stocker, it's all-business inside: a couple of gauges, a big Hurst gear lever and clutch, brake and accelerator pedals. The exterior is similarly functional.

The standard engine is an exclusive high-output version of Plymouth's 383 cu. in. V-8. Optional, and very fitting, is the big 426 Hemi.

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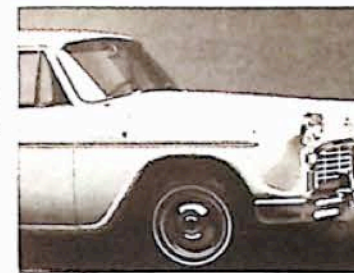
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FOR YOU AND YOUR CAR

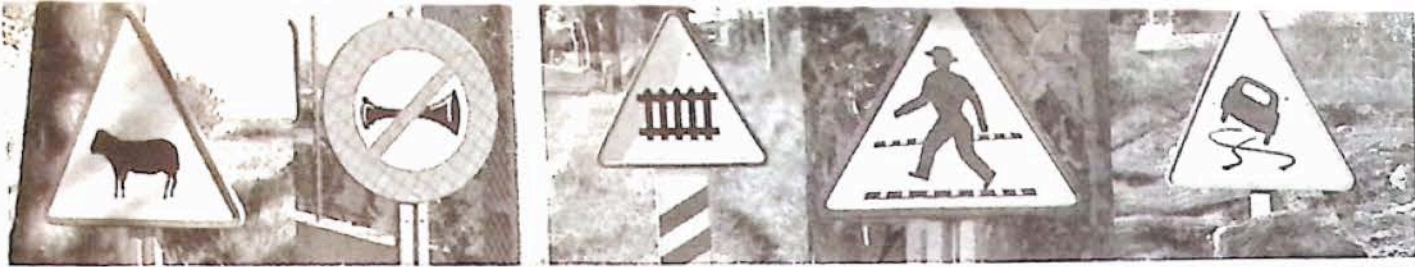
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OPINION & COMMENT

from the publisher

Help Stamp Out Non-Uniformity

THIS IS THE AGE OF NON-CONFORMITY. Right? It's way out or gauche to conform. Right? We all abhor uniformity of any kind. Right? Wrong. We disagree that uniformity of all kinds is bad. For example:

Isn't it better that all cars built in this country have their steering wheels on the left and that we all drive on the right side of the road? Can you imagine the chaos that would exist if from state to state some of us drove on the right, while others drove on the left? It's too gruesome to contemplate. The Swedes finally saw the light and have switched over to driving on the right—in an attempt to make driving in other European countries less of a trauma in the lives of their natives traveling abroad and of tourists visiting within their borders.

A number of years ago most European countries also adopted a fairly uniform sign system that allows a person to drive from one country to the next and be able to understand the road signs—even without understanding the language of that particular country. There is no mistaking a pedestrian crossing for a train crossing—and you don't have to read any language. (See photos above.)

Over the years there have been several attempts to standardize signs in the U.S., but the efforts always seem to bog down on three points: (1) the independence of the individual states ("states' rights, you know!"); (2) agreement on how the signs should be standardized; and, (3) the cost of changing over to the new system, whatever it is. Now, with the President and Congress behind highway improvement—as part of the Highway Safety Act of 1966—maybe we will see a bit more action, as well we should.

Over the past few years there has been, admittedly, some movement in the direction of standardization, particularly toward the pictorial type of sign. Some states have adopted pictographs for school crossings and other more obvious purposes, while more are being installed as tests. The most dramatic proof of what easily-legible signs can do was reported recently by Time magazine: "After California installed (the European-style no-entry sign with a white hori-

zontal bar on a red circle) on its freeway exits two years ago, the number of fatalities caused by drivers heading up the down ramps was cut in half."

An organization dedicated to unraveling the confusion caused by the variety of highway signs extant is the National Joint Committee on Uniform Traffic Control Devices in the U.S. Dept. of Transportation. It is that committee's belief that if signs are hard to read, they cause confusion in the minds of motorists, in turn contributing to accidents. There certainly can be no dissension on this score, yet we continue to have a proliferation of signs, all different, yet all with the same purpose in that they are trying to instruct or warn the motorist. If motorists are to be instructed or warned properly, they should be told the same every time, regardless of where they drive.

At this point, we don't know what the Uniform Traffic Control Devices Committee will recommend in toto, or after they do, what the Dept. of Transportation will do about it. We do know that they are behind uniform symbols (such as the European pictographs) and a wider use of specific colors for specific uses, i.e., besides red for danger, yellow for caution, etc., they are recommending purple signs for school zones, orange for road construction, and brown for public recreation areas. With this, we feel they're headed in the right direction and we are behind them in this.

While we're on the subject of uniformity, we'd like to bring out some other areas of highway construction that should also be standardized so as to present a consistent driving environment, for YOUR benefit.

Last year, SAAB and New York University sponsored a seminar on safety, with the theme being "Safety Through Standardization." In the area of traffic engineering and highway construction, Edmund Ricker (Pres., Institute of Traffic Engineers and Director, Traffic Engineering Bureau, Penn. State Dept. of Highways) presented his views. His underlying theme for all suggestions was uniformity and consistency, and he used the Interstate System as a good example. "Good design of highways,"

he said, "can contribute to driving safety and comfort, and in avoiding surprises."

How many times have you been on the right to make an exit then found at the last minute that the exit was to the left? And how many kooks have you seen backing out of an exit because they took the wrong turn, or backing along an expressway because they went past their intended exit? The ratio of these could possibly be cut down if there was more consistency in exits and signs.

Ricker points out that troubles on freeways and expressways "are generally associated with non-uniform situations, as at temporary endings, left-hand off ramps, confusing interchanges, weaving areas, or lack of capacity." He suggests (and we heartily endorse): 1. Consistent design of interchanges, not one left-hand exit in midst of right-hands, no half cloverleaf mixed in with diamonds. 2. Only one decision at a time presented to the driver, with distance between successive decisions. 3. Adequate capacity to avoid lane changes, slow-downs and stops. 4. Consistent design standards for lane width, shoulders, sight distance.

We're all for continuing improvement in signs, highways, traffic signals and everything to do with traffic engineering and highway construction, but they must be approached with a consistent plan. As Ricker pointed out: "Many people, even professional traffic engineers, keep inventing new devices or modified uses of existing devices which are non-uniform. Initial tests, largely depending on the novelty of the device, may show favorable effects on traffic movement." Later, they are found lacking, he points out, adding one more inconsistency to the total spectrum.

You can tell (isn't it obvious?!) that we feel strongly about this subject. If you feel as we do, write your Senator, Congressman or State Representative. State your views. Write us. Speak out! Highways are built for you and me—with OUR money. We have a vested interest in seeing that they are built, if not completely to our liking, then at the very least the best way possible. —Walter A. Woron



The safe tire.

The original Super Sports
Wide Oval tire.
Anything less is less.



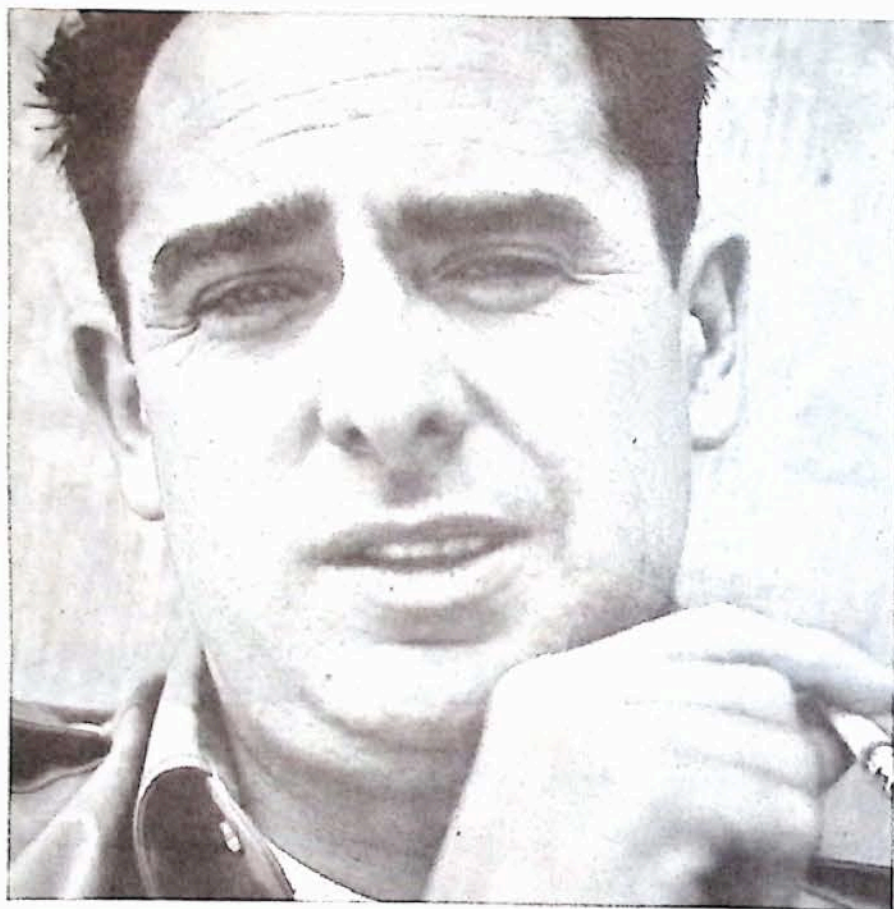
Nearly two inches wider
than your present tire.

Have you noticed? How tires are getting lower, wider? This is the tire that started it all. The Firestone Super Sports Wide Oval tire. We introduced it more than a year ago. The world of wheels hasn't been the same since. It's a new kind of tire. Built wider. Nearly two inches wider than regular tires. To grip better. Corner easier. Run cooler. Stop 25% quicker. It's built with rugged nylon cord for extra safety. And like all the Safe Tires from Firestone. Wide Ovals are custom-built, one by one. And they're personally inspected for an extra margin of safety. Get the original—the Super Sports Wide Oval. At any of the 60,000 Firestone Safe Tire Centers nationwide.



Firestone

"No, I never finished school. But I've had a lot of jobs. Even been out to California a couple times. I get around okay, even if I haven't got a car right now. I'm 36, eat regular and nobody bugs me. The lady where I room even lets me watch the TV sometimes."



Nobody bugged him to stay in school, either. Too bad. That's why we'd like to "bug" you now. Stay in school. Get a good education. That's the only way to get rolling in a worthwhile career. And, speaking of careers, we've written a short booklet about one that might interest you. It's called "Your Career in the Retail Automobile Industry." We'll be happy to mail you one free. Send us a postcard with your name, address and the word "Career" on it. Send it now. You deserve more out of life than "TV sometimes."



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We've made changes in the new Citroën.



But don't get the idea we're just another pretty face

Sure. Even when you've got a good thing going for you, you still work at making it even better. So this year, we've got quad headlights, relocated air scoops, and replaced the generator with an alternator.

Better, sure. A lot better than pushing chrome around, or changing a curve here and there, or dreaming up crazy reasons why it's supposed to make you the most popular guy on the road.

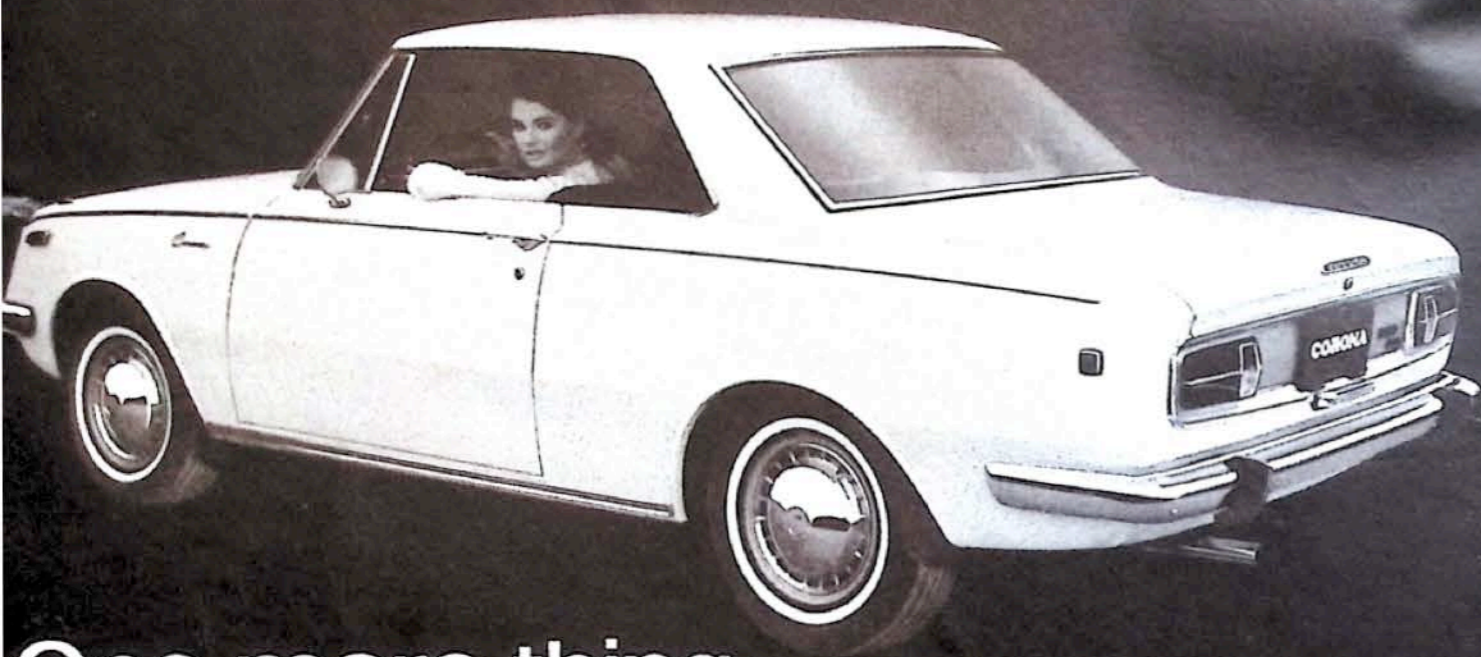
You can't miss seeing Citroën's amazingly aerodynamic design. And once you drive it, you won't miss feeling the comfort

of Citroën's smooth Hydropneumatic suspension. Or the road-hugging traction of front wheel drive. Or the safety of the instant-acting disc braking system to match the high performance of the rugged "hemi" engine.

The fact is, you just can't separate outstanding performance and outstanding safety. That's why we built our car from the road up. And that's why we had to come out looking pretty extraordinary.

Which is O.K. with us. After all, we wouldn't want you to think of us as just another pretty face.

Sales and Service throughout the United States and Canada. For Dealer List, literature, or European Delivery brochure, write:
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Toyota gives you
is 4-on-the-floor[®]
and bucket seats



\$2055* Now they're standard in America's lowest priced 2-door hardtop! Grip the stick of a Toyota Corona. Power it through 4 synchromesh gears, and then get a grip on yourself. Because 90 hp never felt so good! 0-to-60 in 16 seconds! Tops 90. And still delivers 25 miles or more per gallon! One more thing Toyota offers (as optional equipment) is a fully automatic transmission. And, you get two mirrors to admire your following in.



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Parts and service available coast to coast.

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*White sidewall tires, accessories, options, freight and taxes extra.

INSIDE DETROIT

Gripes Over '70 Smog Standards

The automakers have reluctantly admitted they can meet the federal government's proposed 1970 air pollution standards—but with important qualifications. As reported earlier, the manufacturers object particularly to the requirement for controlling evaporative emissions from the fuel system. In formal papers presented to the government, they want this requirement dropped except in California. If it is dropped, they say they can meet the new standards covering exhaust emissions of carbon monoxide and unburned hydrocarbons. The new standards reduce by one-third the amount of such emissions allowed under the current regulations. The companies also want major changes in the proposed testing procedures. While they obviously want to avoid a fight similar to that involving the safety standards last year, they have carefully prepared their legal position should this be necessary by telling Washington that if the industry's changes aren't adopted, the regulations as proposed violate the Clean Air Act, under which the anti-smog rules are published.

New Insurance Tried

Motorists in two Illinois counties are the subjects of an experimental auto insurance plan. Several insurance companies are trying the new system of paying accident victims in DuPage and Kane counties. Motorists in the counties are being offered settlements of up to \$12,500 per person on a guaranteed basis, without any determination of which driver was at fault, if they are involved in accidents. The experiment was approved by Illinois Insurance Director John F. Bolton Jr., who said it may reduce insurance costs by cutting some of the red tape. If successful, it will be tried in other states. It's patterned after a plan advocated by two law school professors. (See MT, March 1967, Pg. 94).

Socialized Transportation

The Transportation Department is trying to find ways of replacing the automobile and says free bus service in the cities may be an answer. Transportation Secretary Alan S. Boyd puts it this way: "We may be approaching the point where someone near San Diego, Calif., hits the rear bumper of another car and starts a chain reaction ending when someone else dents his

radiator near Portland, Ore. We are doing all that can be done to find alternatives to the car. We are examining the idea of providing free bus transportation in the cities—what the impact will be to the cities and people living there." Can't you just see Cadillac building a luxury bus to transport all those auto executives from Bloomfield Hills to the GM Building each morning? Or how about Henry Ford II waiting at the corner bus stop in Grosse Pointe?

Ford In Your Future? No!

The standard-size Buick served as the design target for the 1969 full-size Ford and Mercury models. Thus, while they will be all-new, the packaging and engineering concepts come from Buick. This means both the Ford and the Mercury will be longer and lower than at present. Styling is said to be sensational.

Improved Ford Tailgate

FoMoCo, which got the jump on the industry with its 2-way tailgate for station wagons, will have an improved version for 1969. You will be able to keep the window rolled up when you open the tailgate from the side, as on a conventional car door. Up to now, you had to roll down the window to operate the tailgate either way. You will still have to roll down the window, naturally, when you use it as a tailgate. Incidentally, General Motors is finally getting around to introducing the 2-way tailgate on its station wagons. Word is, though, that the GM tailgate for 1969 is based on the original Ford patent and thus Dearborn will still have the edge on GM in this department.

Safety Costs To Be Itemized

Hearings will be held later this year on a bill to require automakers to list all their costs on cars they sell to the federal government. The proposed legislation submitted by Senator Abraham Ribicoff, D-Conn., would have the effect of making the manufacturers show the real cost of the safety items they are putting on automobiles. Such cost data has traditionally been a closely-guarded secret in the industry.

Hidden Headlights Must Appear

The automakers found that some of the fine print in the proposed 1969 safety standards spelled trouble. They

RUMOR MILL

Radical styling change set for the 1969 Mustang... False. One Ford man who's seen it says the new Mustang "doesn't look that much different from this year's." There will be a major change in 1971, though.

Those new shoulder belts cost only \$3 per set... False. "If you can find them at that price, you've got a job," says GM President Edward N. Cole.

Uniroyal has a puncture-proof tire... Partly true. Its new version of the Uniroyal Master is a "near hazard-proof tire," the company says. The tire has a rubber impregnated mat of steel wire under the tread which Uniroyal says is "capable of withstanding most punctures from spikes, bolts, sharp glass, stones and other road objects."

The auto safety standards are giving suppliers headaches... True. GM's "Spear" project calls for strict quality control standards for suppliers producing parts that could affect a car's safety. Production records on such parts must be kept for five years. It sounds more like the shaft than the spear, according to one supplier. But the automakers have little choice since they must certify to the federal government that the entire car meets U.S. safety standards.

New Ford President Bunkie Knudsen is feuding with some top company executives... False. But there have been hints of some barbed comments one VP had for Knudsen. As the story goes, the exec, Robert Stevenson, in charge of international operations, was showing Knudsen designs for future Ford of Britain and Ford of Germany cars. The designs are quite similar although the cars will be built from separate tooling. Since different tools will be used, Knudsen wondered why Ford stylists didn't make the designs more distinctive. "We don't do it that way at Ford," Stevenson is supposed to have replied. This illustrates one reason why Bunkie was hired, for Knudsen's point was well made. The similarity of its car lines has long been a Ford problem. The Mercury, which has become more distinctive of late, was for many years little more than a dolled-up Ford. Likewise, the Comet in relation to the Fairlane. On the other hand, one of GM's strong points is that it's able to make cars look different although they come from common tooling. That's one reason GM dominates the medium-priced field.

Because of Bunkie Knudsen's defection to Ford, General Motors is thinking of equipping executives with self-destruction devices... False.

Cadillac is planning to stop making convertibles... False. Company sources say they are in production plans until at least 1971.

"And finishing 1st and 2nd in the NASCAR Grand Stock Drags are..."



Dan Smoker and Tom Sneden. Dan driving "Big Red," above, and Tom, the "Bob Banning Dodge."

Placing at all in this tough circuit is a great testimonial to driver and car. But coming in first and second means extra-special car care and driving skill.

It indicates a good oil was used, too. It was. Quaker State Racing Oil—refined from 100% Pure Pennsylvania Grade Crude Oil to exceed the needs of Up-Front finishers. Quaker State Racing Oil provides maximum bearing protection, prevents piston scuffing and minimizes foaming. Its quality really stands out under the grueling conditions of the Drag Circuit.

See how much more performance you can coax out of your car—when you use Quaker State Racing Oil.

Quaker State your car to keep it running young.



INSIDE DETROIT continued

complained about the technicalities of a standard dealing with disappearing headlights. The government wanted them to guarantee a "fail-safe" system to prevent the lights from disappearing when in use at night. The manufacturers objected. The government also wanted a 3-second opening cycle whether the temperature was 20 below or 120 degrees above zero. The manufacturers suggested a 7-second cycle instead.

Car Life Spans Shortened

About 7 million cars will be junked this year. In 1967, a record 6.9 million were not reregistered and are presumed to have been scrapped, according to R.L. Polk & Co. In 1968, if 9 million cars are sold as predicted, there will still be an increase of only 2 million on the road because so many are discarded each year.

The Bunkie Joke

Bunkie Knudsen's defection from General Motors to Ford set off a barrage of jokes, the sort not heard around Detroit in years. Samples: Ford is going to come out with a new camper vehicle called the "Bunkie." Ed Cole says "that talk about Ford having a better idea is a lot of bunk." Ford is going to come out with a Wide Track Cougar. One of Ford's 1969 car models is going to be called the "Vendetta." The first thing the UAW did when it heard the news was to begin organizing Ford VPs. A new version of the kids' game "Simon Says" is being played by Ford execs who call it "Simon Says."

Auto observers say the real reason Bunkie quit was that GM wouldn't give him another six minutes washup time. There's even a "Knock-Knock" joke going around GM. It runs like this:

"Knock, knock."

"Who's there?"

"Bunkie."

"Bunkie who?"

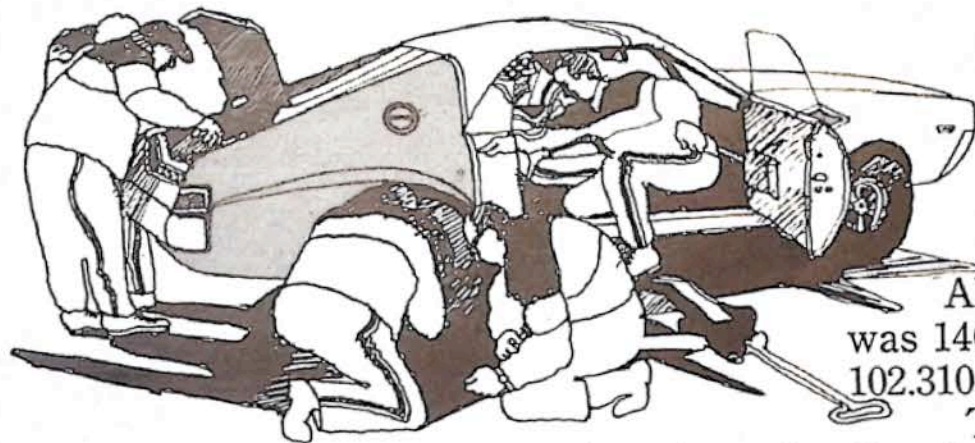
"You mean you've forgotten him already?"

Commented one auto exec: "I don't think these will last as long as the Polish jokes."

Socialized Insurance

The Social Security system ought to help automobile accident victims. That's the suggestion of Prof. Alfred T. Conard, of the University of Michigan Law School. Conard says something should be done to provide pensions for the permanently and totally disabled victims of highway crashes. Survivors of people killed in accidents also need to be cared for if the victims are not covered by Social Security. The only practical way to supply these

Mr. and Mrs. Breedlove went for a nice, long, Sunday drive in an AMX.



AMX's average speed for 24 hours was 140.790 m.p.h. The old mark was 102.310.

The AMX also broke 16 records in Class B (with a modification of the optional 390 CID engine bored out to 397 CID).

For 1,000 kilometers standing start the AMX averaged 156.548 m.p.h. The old record was 148.702.

For 75 miles flying start it averaged 174.295 m.p.h. The old record was 172.160.

Every record set by the specially prepared and modified AMX's was sanctioned by USCA and FIA.

And this is just the beginning.

They drove right into Monday and 3,380 miles later they broke 77 speed records.

On Thursday and Saturday they came back and broke 13 more records.

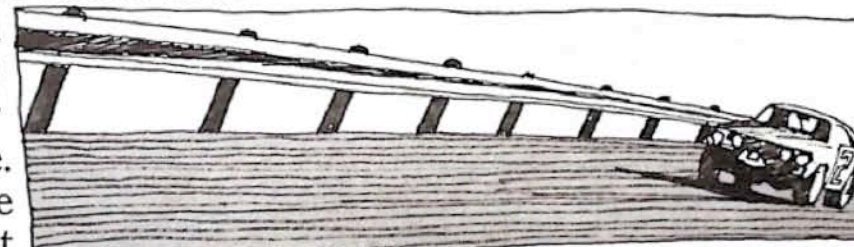
And on the following Tuesday, they broke 16 more. All in all the Breedloves set

a total of 106 records in the 1968 AMX.

90 Class C records were broken (with a modification of the standard AMX 290 CID engine bored out to 304 CID).

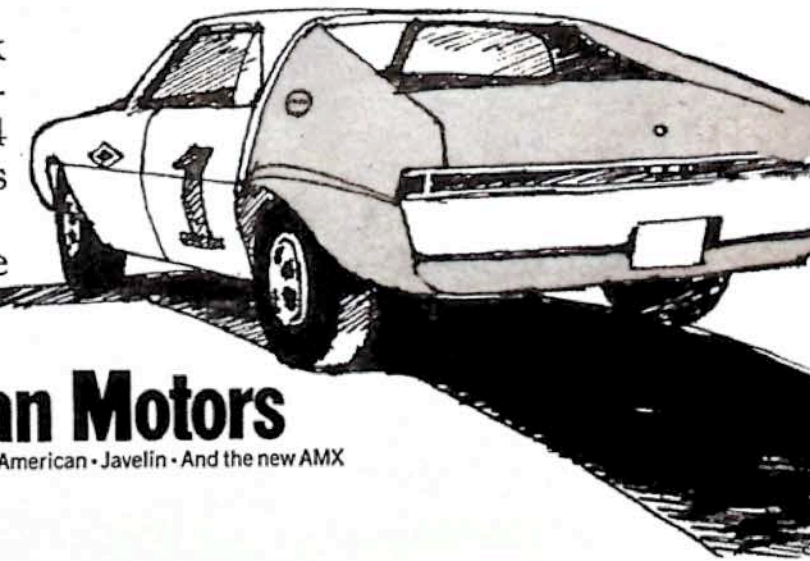
That's every record in the book from 25 kilometers to 5,000 kilometers. From 1 hour to 24 hours. From standing starts and flying starts.

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INSIDE DETROIT *continued*

pensions, he said, is "a slight extension of the coverage of survivors' and disability insurance under the Social Security system."

Computerized Traffic

Using computers to control traffic signals can result in important savings for motorists. IBM, which installed in San Jose, Calif., and Wichita Falls, Tex., the only two such units in the United States, has some estimates that the system saves San Jose motorists \$882 per day—in total, not for each car—and reduces traffic delays by 12%. Fed information from detectors buried in the roadway, the computers adjust signals for the best traffic flow.

GM Still Won't Race

Despite all the rumors, there'll be no changes in the General Motors policy on auto racing. GM President Edward N. Cole reaffirmed the firm's stand against competition at a recent news conference. But in so doing, he still managed to convey the feeling that he would like to see GM back on an official basis, but that this isn't possible because of the chance of arousing the ire of federal safety officials in Washington.

'69 Price Hike

General Motors has joined Ford in hinting car prices will go up again when the 1969 models come out. The industry has come under fire for the \$116 hike last fall and the \$23 hike in January when shoulder belts were made standard equipment by government edict. The industry, faced with a congressional investigation of its pricing policies, particularly as they relate to safety, insists prices should have gone up even more. GM Chairman James M. Roche says they "actually could have gone up substantially more." Roche and other auto officials cite higher labor and material costs. Does this mean another hike in 1969? "We are no magicians," Roche replied. Headrests alone could boost prices \$40. They will be required after next Jan. 1 by the federal government. They now cost about \$40 a pair as optional equipment. The car firms, of course, could simply build seats higher, but they're not expected to do that at least for a couple of years.

Electrics — Further Than You Think

New evidence that both Ford and General Motors are masking the true proportions of their efforts in the electric or part electric field arose when a Ford research executive admitted that more than 50 scientists are working full-time on problems relating to the

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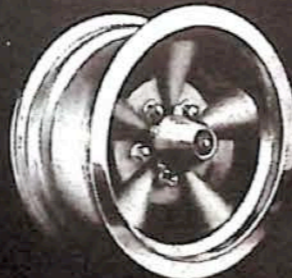
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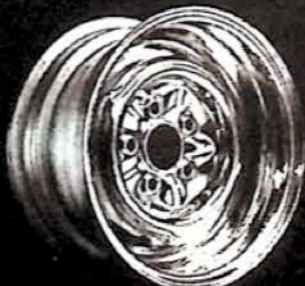
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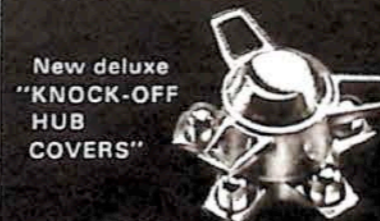
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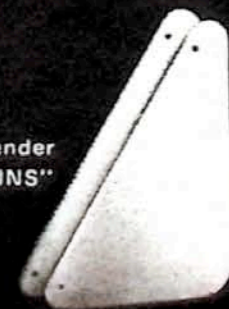
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INSIDE DETROIT *continued*

electric vehicle. This is said to be more than on any other single project at the Ford tech center.

And at the winter meeting of the Institute of Electrical and Electronic Engineers, two GM scientists described a lightweight vehicular electric drive system featuring a variable speed induction motor drive à la Electrovaïr. While this system also can be used for off-highway vehicles, torpedo and marine propulsion and even servo systems, the scientists admitted it was equally suitable either for another Electrovaïr or a part-gasoline part-battery car.

Most important, the system has been simplified and improved so that ratio of the size and weight to power and torque is improved vastly. Weight of controls, for instance, has been reduced by 25%.

GM, which should unveil a part-electric vehicle sometime this year according to some sources, remains committed to high-temperature, potentially dangerous electrochemical interactions as the ultimate battery solution for the electric, like lithium-chlorine.

It's An Accessory Market

Price increases apparently haven't prevented many people from loading their cars with extras. Ford said that installation of optional equipment has increased at a phenomenal rate. For example, air conditioning is being installed on almost half of the standard-size 1968 Fords, up 16% over 1967.

Steel Strike Looms Evil

The 1969 models could be in short supply if there is any prolonged steel strike this year. The auto firms have started stockpiling steel to make sure they can start the 1969 model run even if there is a walkout. "We are aiming for a 2-month supply," says GM Chairman James M. Roche. Ford's in a better position because it makes about half its steel—the only auto firm to do so. This is one reason Ford was able to beat Chevy in sales about 10 years ago. A steel strike then crippled GM production. There are no plans to end 1968 model production ahead of schedule to begin an early changeover and start-up of 1969 production.

Anti-Skid On Horizon

The year 1970 has been mentioned by one auto company executive as the time when anti-skid devices will find their way onto American passenger cars. "There are still problems to be worked out but I don't see why they can't make it in a year and a half," he said. Others are not so sure about the timetable.

/MT



Finally.

The Jaguar XKE is the kind of car you dream about owning. And its price is a real sleeper.

\$5372.

This includes prime hide leather upholstery, reclining bucket seats, 8 hand-rubbed coats of paint, adjustable steering column, real wire wheels, radial-ply tires, 4-wheel independent suspension, and 4-wheel disc brakes.

The 1968 XKE is more power-

ful than any imported car selling under \$10,000. Yet, for all its power, the XKE can cover about 20 miles of turnpike on a gallon of gas.

All 1968 cars sold in the United States had to meet a long list of safety requirements. Jaguar engineering not only met these requirements. It exceeded them.

The XKE comes in three models: Roadster (shown above),

Coupe and 2+2 Family Coupe. The 2+2 has more passenger and luggage space, and offers optional automatic transmission.

Isn't it great someone still makes a car that lives up to your dreams?

Jaguar

ALFA ROMEO's exciting new 1750 range stands as good a chance of having an equally impressive impact on the performance/quality-conscious public as the legendary 1929 version did. Included in the group is a newly designed sedan model, a slightly modified GT coupe by Bertone, and a more powerful Spider Duetto whose body remains the same.

One of the most unusual considerations of the new range is that the 1750 is obviously more roomy than previous models, a quality that hasn't been evident from the outside of Alfas after model changes. The sedan's trunk is larger, too, and general comfort has been improved substantially compared to the Giulia. The engine is now a 1779cc unit fitted with two double Weber carburetors and has the power reserve and torque of a 2-liter car.

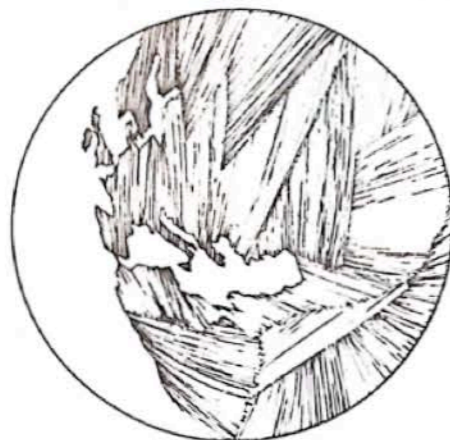
Outside, the car appears longer and lower than its Giulia sister; the front grille looks very much like that of the old 2600 — meaning that the four lights are separated further from each other than on the Giulia.

Inside, one seems to first notice the seats, which are very well designed to provide any of the five passengers with a maximum of comfort and support. Legroom is very good in the rear, even when the front seats are set all the way back. An interesting innovation is a convenient glove compartment between the two rear seats. This naturally restricts the car to a true 4-place, but a pillow can be used on the glove compartment for fine comfort for the fifth passenger. Further comfort is given by the increased length mentioned earlier — 172 inches instead of the 162 of the Giulia. Wheelbase has also been increased by 2.36 inches.

Directly in front of the driver's eyes are two clear, easy-to-read instruments: the tachometer on the left and the speedometer on the right. In the center of the front compartment is a wooden console on which the gear shift is mounted, as well as four control instruments (oil pressure, water temperature, fuel gauge and clock), plus three buttons which command the dash light, the 2-speed ventilator, and the 2-speed wipers. All controls are right at hand. Some room was spared on the side of the console for two front loudspeakers that can be mounted for a stereo installation.

As is typical of the Alfa tradition, the driver's position is excellent. The front passenger, however, must keep his feet slightly to the right side because of the large console.

The *raison d'être* of the car is the double-overhead-cam engine that gives 132 hp SAE at 5500 rpm. The power-to-weight ratio is excellent since the car weighs only 2447 pounds. With its 137.42 lbs.-ft., the torque is out-



EUROPEAN HOT LINE

standing, and very useful, especially with a 5-speed gearbox. Top speed of the 1750 is announced for 180 kph (112 mph), a speed which is easily reached on the speedometer. To further improve the powerplant, an alternator has been fitted in the electrical system. The suspension remains the same, except for an additional stabilizer at the rear and more flexible springs. The power-assist brake system uses a weight compensator on the four discs.

When the engine is started, it is immediately noticeable how Alfa has accomplished a substantial noise reduction with a better exhaust and more thought to sound proofing. The passenger compartment has a thick insulation material which seems efficient, but if you are missing that typical, attractive Alfa noise, keep the engine at 5000 rpm and it will soon reappear in all its petulance. Though the gearbox is a bit hard on the new model, it is still extremely precise, and that is a main factor.

During the initial drive, the torque makes a great impression, and one soon becomes anxious to see what he can do, and how far he can go in playing with it. For example, 5th accelerates from 1300 rpm with ease and smoothness. The quarter-mile is covered in 18.3 seconds from a standing start, and the kilometer in 32.8 seconds. Especially impressive is the 18.4-second quarter-mile done in 4th gear beginning at 40 kph. The 4-wheel disc brakes are very smooth, precise and well-balanced.

Road holding is also in the Alfa tradition, being safe and predictable, although with a certain amount of body roll. The car has a slight tendency to understeer, but without making any surprises. On fast curves it becomes neutral, and you can relax and enjoy the precision of its smooth, direct

steering. On especially bad-surfaced roads and curves, however, the old Alfa suspension makes itself known with no little amount of agony—even though this car stands as the highest standard for this type of suspension. One can't help but feel that soon they will be forced, for several reasons, to come to a more comprehensive, more efficient independent rear suspension.

Along with their sedan, Alfa introduced the 1750 engine in the Bertone GT coupe, whose body is unchanged except for the front grille, which is slightly modified and now has double headlights.

"WITHIN FIVE YEARS," said an executive for a European car maker which now does not offer Americans any kind of automatic or semi-automatic transmission, "the clutch pedal will be as obsolete in Europe as it is in America. The only reason for desiring a clutch shift now or a sedan is that one can't afford anything better."

Yet, despite the Fichtel & Sachs semi-automatic, the Borg-Warner, Ferlec, ZF and other automatics, no one to this day has solved the problem of a fully automatic transmission for the vehicle of small displacement. Renault would dispute this with its electric pushbutton system, but the executive points to the obvious fact that no other company has seen fit to utilize this electromagnetic device.

He thinks the Variomatic belt drive of the DAF offers a better solution. ("Actually," he says, "it's the only completely European solution. All the others borrow liberally from American practice, even, I believe, the electromagnetic system which I understand Packard once tried.")

Volkswagen, which settled on the F & S semi-automatic, still may be experimenting with an all-electronic transmission utilizing solid-state components to replace the gearbox. Apparently the company has not been able to engineer the cost down to reality for an economy car. This has been one of the more hush-hush projects at Wolfsburg, according to our informants.

However, the company is not alone in transmission R&D. Indications are that this part of the automobile has had—and will continue to get—high priority at Daimler-Benz, BMW, Fiat and BLMC.

Experts seem to feel that, unless there is a break-through in electronic transmissions, the semi-automatic of the F & S type will dominate the small car field because it robs less power from a power situation that is none too plentiful already. American-type torque convertor or planetary gear or rotary vane-type automatics are much less efficient in getting power to the driving wheels. In fact,

a certain amount of slippage is necessary in some cases, not very important when one is losing maybe 10 out of 300 bhp but equate that 10 against 50 or 60 bhp.

The European executive repeated the story of how Rolls engineers bought an American transmission and were appalled by the fact that there was so much slippage. They polished and honed all the parts to much closer tolerances—and the transmission wouldn't work at all. The American company told them why and they then installed its products as delivered.

The Renault pushbutton automatic retains gears but shifts them automatically by electrically actuating a magnetic powder. It, however, has three gears and reverse rather than the four and reverse of the standard shift car. The company has been working on the problem of smoothness of shift since early automatics of this type had a tendency to pause, then jump into the gear selected.

The advantage of the Renault system is that it robs no power, something none of the other automatics can say.

The new MGC and MGC/GT can be had, at least in Europe, with BMH's very fine 4-speed automatic. This unit uses a torque convertor, but backwards, because torque is fed into the

convertor end farthest from the engine and comes out the end nearest. Gears on the BMH system are changed by locking parts of the differential.

Only Mercedes-Benz and Rolls-Royce have 4-speed automatics besides BMH. However, the old idea that automatics of this type can't be tried on tiny engines is smashed by Honda, which has something called Hondamatic for its 600cc car.

Honda changes gears via a complex system of constant mesh gearing and multi-plate clutches. Hondamatic works but Europeans question its repairability should anything go wrong.

VW's automatic for the 1600 (fast-back, squareback and wagon), not yet available stateside, involved separating the convertor from the rest of the gearbox. This forced the modification from a simple independent rear suspension to a semi-trailing link system, since the final drive output shafts are pushed forward.

Some proposed electronic transmissions—none in production use to our knowledge—involve units which could "decide" which wheel gets how much power, utilizing oil forced through a rotor system to transmit the power. It is somewhat like an advanced version of the old Buick Dynaflo as explained.

The Porsche Sportomatic (see test

on page 80) is in reality a semi-automatic since it retains a clutch and gearbox but moves actuation of the clutch to the hand. This is the same as the basic F & S which relies upon electric switches in the gear shift to do the clutching and upon a convertor to make the shifts smooth.

All of these automatics but one are complicated and expensive. That one is the DAF belt drive, which by using various size belts obtains an infinite number of ratios. Improvements on the system used on the DAF 44 are said to make the system even more foolproof. Strangely no one else has attempted the system.

Another European trend in transmissions is the 5-speed gearbox. Porsche, Alfa and Fiat are key converts but the most interesting of these is the box on the 124 Spyder. All of these are, in fact, overdrives. However, only Fiat chooses to put the 5th gear in an auxiliary casing. Yet they are a better solution than the conventional overdrive unit which may be smoother but certainly adds weight and cost.

RENAULT may soon be importing cars from Canada. The company has given its Canadian affiliate La Societe de Montage d'Automobile (SOMA) of St. Bruno, Quebec a trial order of 400. The cars would then come into



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EUROPEAN HOT LINE

continued

the U.S. duty free. However, at least 50% will have to be from Canadian-built parts by August 1st. SOMA also assembles Peugeots. If the trial is successful, eventually several thousand Renaults a year will come from Canada.

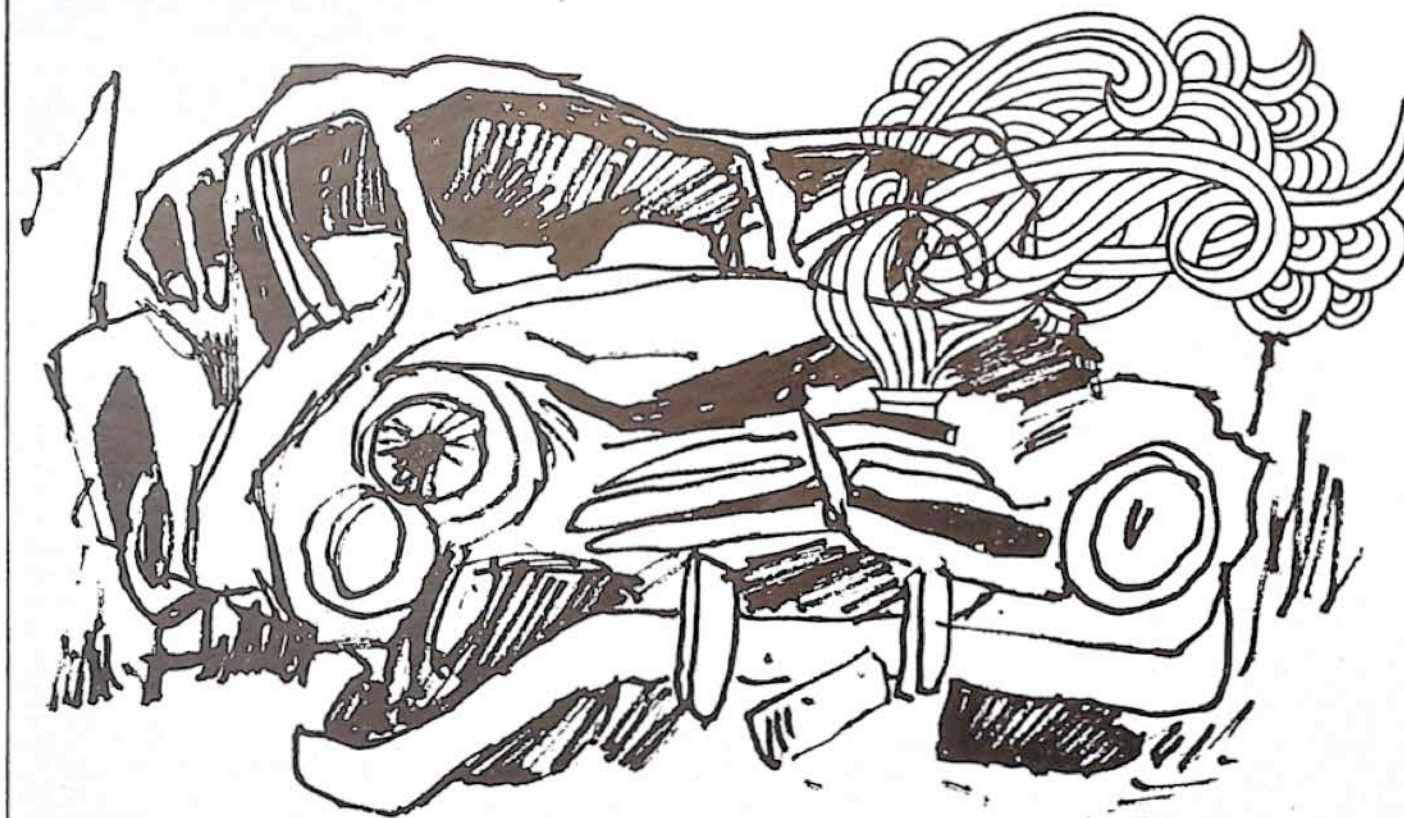
THE FERGUSON All-Wheel Control anti-skid system has been tested successfully on a Mustang, and Sweden and the British company are considering offering the 4-wheel drive with anti-spin and anti-brake lock features for similar V-8 models. At a production of 50,000 systems a year, the company estimates a retail price of \$480 per car. Preliminary reports at this writing say a Mustang so equipped will outhandle \$6000 European sports cars.

VOLKSWAGEN has acquired a 25% interest in Industrias del Motor, SA (Imosa), Spanish manufacturer of small trucks, who will take over distribution of VW in Spain. VW is behind an appeal to the Franco government to allow construction of a plant capable of making 125,000 cars a year. Government has refused VW so far but may allow Imosa to do so. Reason: lower labor costs and equally excellent shipping location for overseas points.

IF PORSCHE HAS ITS WAY, the next member of the constabulary to nail you for a ticket will be mounted in a specially equipped Targa convertible with 5-speed transmission, built-in roll bar, blinker, siren and loudspeaker. The company showed what eight European countries use — or selected police do anyway. Those attending any of the major shows this year will see a tangerine and white Dutch police car. A man at the Porsche exhibit in Washington declared he had "several towns interested." The roll bar comes in handy to handcuff prisoners to something solid.

IF YOUR AREA doesn't already have one, it probably will soon. We're talking about rental and lease operations for foreign cars. Several import companies are interested but Saab is most aggressive in trying to interest its dealers in getting into the rental-lease business. This way you can lease a BMW one month, then — because you have to make the big impression — get an XK-E Jag the next. Incidentally, did you know that Avis and Hertz are in the overseas delivery business? That makes things about even between the dealers and the rent-a-car people.

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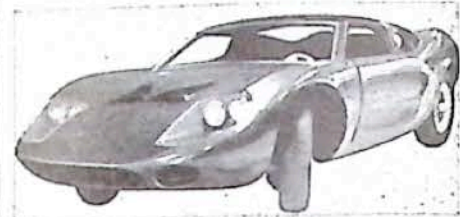
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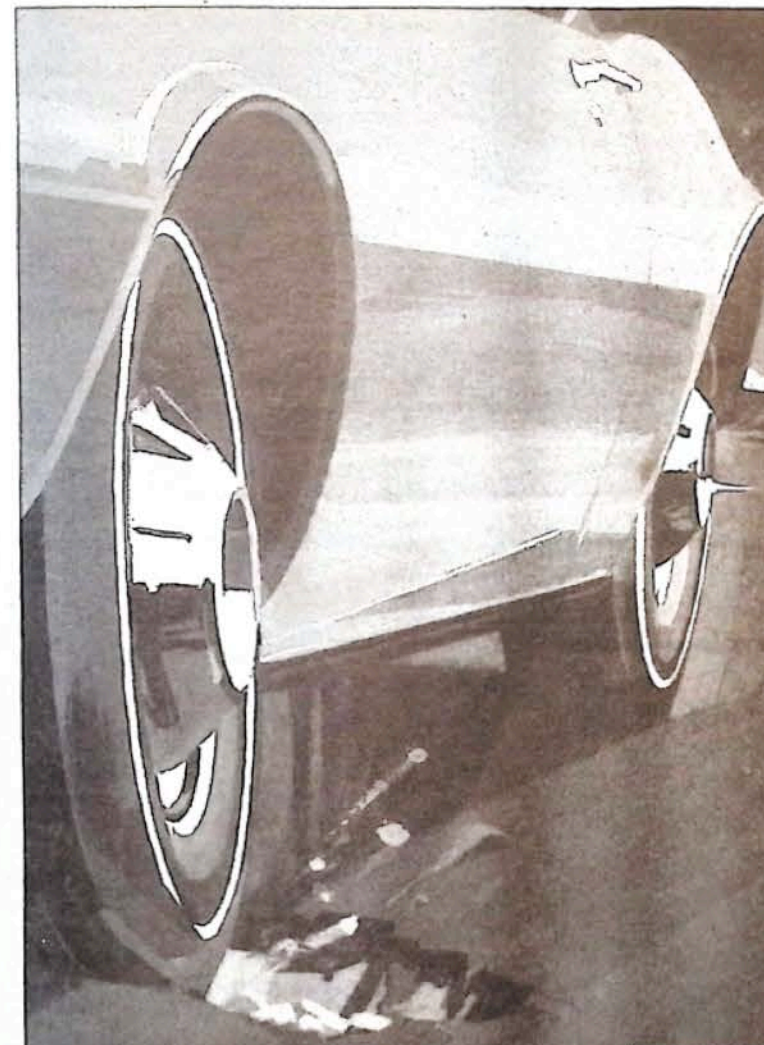
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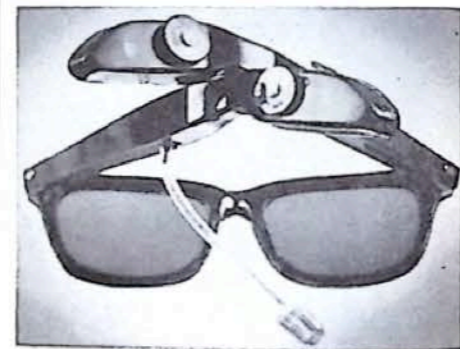
car somewhere. So what are you waiting for, one thin quarter sent to P.O. Box No. 6373, Fairgrounds Station, St. Louis, Mo. 63107 will fetch you two colorful Carter decals.

in stopping power...

Everything's going high-performance, heavy-duty and wide-oval, right? Well, if you can get the cars going faster more reliably what about getting them stopped? Better brakes, right? Sure, everybody knows that discs are the hot-setup but when you start upgrading the capabilities of something like brakes, the whole system has to be upgraded. Even the brake-fluid? Especially the brake-fluid. Prestone Division of Union Carbide Corp. announces the new plateau in brake-fluid technology—Prestone HSP (High Stopping Power) Supreme. Proven in the crucible of competition from Daytona to Indy to Pikes Peak, HSP Supreme meets or exceeds SAE standards for brake fluids and possesses a boiling point of about 225 degrees higher than regular heavy-duty fluids.

in the H. G. Wells department...

Just put on these sunglasses and tune in your favorite radio program—just like you see in Dick Tracy. Ingeniously designed, most people will have no idea your handsomely fashioned sunglasses conceal a powerful but tiny radio receiver. It's better than having a bug on your telephone. Distinctly not a toy—but a precision-made electronic instrument—the radio has three space-age transistors and a diode powered by an energy cell (battery) about the size



of a dime. Through the lightweight plastic ear plug you have excellent pickup range and true fidelity and tone. The tuning dial and volume control with on-off switch are inconspicuously located on the glasses' arms or bows. The sunglasses are fitted with high-quality optical lenses that effectively screen out glare or, if you wish, your optician can insert prescription lenses into the frames.

What's this got to do with cars? Well, really not very much unless you ride in a car-pool where everyone else likes Bach and you dig "soul." Then too, for \$19.95 it's a lot cheaper than a regular car radio. Write Frank H. Decker, Dept 144, 55 Crestwood Drive, Newport News, Va. 23601—maybe he's got some other ideas.

in Walter Mitty land

If you've ever been a racing driver, out on the track, looking for your pit signals and unable to see them—or ever been a crew member, waiting in vain for the chalk-

"If J/Wax Kit doesn't give you a shine as good as any paste wax and a lot easier, I'll turn in my trophies."

There's nothing ordinary about Kit. This is the paste wax that's pre-softened—so it doesn't take a lot of muscle to put it on. Kit liquefies as it hits your car's surface, practically slides on. And does a deep, thorough cleaning job as it waxes.

You can forget the old hard buffing routine, too. Just let Kit dry to a haze, then easily buff it off. You get a shine that's deep and lustrous, and hard as nails. Try it. J/Wax Kit. In the yellow tub with high-speed applicator or convenient tin.

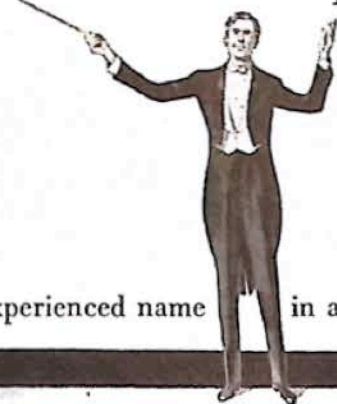
Stirling Moss



©1968 S. C. Johnson & Son, Inc.

From JOHNSON WAX, Sponsor of the CAN-AM Championship Fund

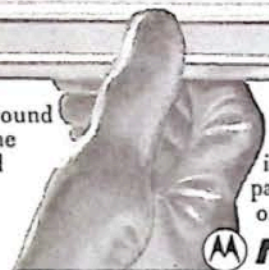
Drive to the magnificent sound of the Motorola car stereo tape player



From the most experienced name in automotive sound



Pamper yourself with the year-round luxury of stereo in your car. The car's interior is a superb "sound chamber." Balance control adjusts for ideal stereo effect. • Uses 8-track cartridges that play up to 80 minutes • Solid state—



instant play, no tubes to burn out • Two 5 1/4" speakers install under dash, in side panels or in doors • Automatic or manual track selection

MOTOROLA

SAFETY IS NO ACCIDENT!

Prevent the accident - Don't just survive it . . .



28 times louder than standard horns; switches off for city driving. Under-the-hood installation for every car.

Hadley automotive air horns — today's safest driving accessory — alert the other driver at a safe, stoppable distance. Accepted by every major manufacturer. With

windows up, radio and air conditioning operating, your standard horns cannot be heard. For more effective defensive driving, mail coupon today for latest catalog.

Hadley Manufacturing Company
2222 Albion Street, Toledo, Ohio 43606
Please forward complete information on Hadley air horns.

NAME _____
STREET _____
CITY _____ STATE _____ ZIP _____



PRODUCT TRENDS continued

board to dry—you've wanted a product like this new one from Ridgeland Industries! The Professional Pitboard is a full 21" x 30", made from reinforced steel of riveted, unit construction with a black, baked-enamel finish. It is scuff, scratch and chip resistant. All letters and numbers are high-visibility yellow, a full 6" high with a 1 1/4" stroke.

All numbers are permanently attached to the board on husky hinge clips. Number flaps are flipped over to change the numbers, and are securely held by spring clips so that they cannot be shaken or blown loose. Number cards are of plastic, so they will not break, chip, or take a set if accidentally bent.

Laps (L), Position (P) and Time (T) read from "blank" to "99." "Plus" or "minus" time can be indicated with a permanently-attached, pivoted indicator. Space at top of board is large enough to permit driver's name, car number, etc., for identification.

The board has been tested for readability at speeds over 130 mph. It works! Priced at just \$29.95 postpaid or, send 25c for descriptive literature to Ridgeland Industries, Box 1176, Oak Park, Ill. 60304.

in new moves . . .

Change for the mere sake of change is not the policy of Checker Motors Corporation. In introducing the new Checker Marathon, the Kalamazoo, Mich. automotive manufacturer continues the basic styling which has identified this increasingly popular car since its inception. However, increased visibility in both front and rear and new interior fabrics and colors set the latest model apart from previous models. Built on a 120-inch wheelbase, the Checker is less than 17 feet long, yet interior spaciousness is 30% greater than the average 4-door sedan. With its two optional fold-away rear seats, the Marathon seats eight adults in comfort. The Checker Marathon station wagon, with the same wheelbase and over-all length, offers 93 cubic feet of usable cargo space, and the absence of the floor hump and rear-wheel wells makes it ideal for wide loads.

Yet another intrinsic value of the Checker is the competitive edge one may gain by choosing certain selected color schemes. For instance the businessman who travels frequently by air will discover an immediate advantage at the terminal with a paint job similar to the airport limousine. The ideal motif in New York is yellow.

The standard 4-door sedan carries a list price of \$3220.50, f.o.b. Kalamazoo, Mich. The station wagon is priced at \$3490.76.

in feet . . .

Wide feet that is . . . for wide-boots. Everything is getting bigger and better in America, that's the way it's always been. Now you can get a strong Original Equipment Manufacture (OEM to you car buffs)-type steel wheel a full seven inches wide to fit today's wider tires. It comes in 14- and 15-inch sizes to fit all popular cars and even a 6-lug configuration for Chevy pickups. Honest Charley, Inc., P.O. Box WF 8535, Chattanooga, Tenn. 37411 gets \$23.95 for the chrome version and \$14.95 for anodized gray.

/MT

With a \$50,000 racing car, they weren't about to scrimp on the ignition coil.

So they got an Autolite coil. Almost a carbon copy of the one you buy.

For under \$10.



This car was built to race in the Indianapolis 500. Built to win, regardless of cost. It's got a \$20,000 engine. A \$2,000 fuel-injection system.

And the ignition coil?

It's an Autolite coil. Almost a carbon copy of the one you buy. For under \$10.

How come a low-price Autolite coil in a high-price racing car? Because there is no better coil. Not at any price. Every Autolite coil is vacuum-heated for three and a half hours to do away with even the tiniest trace of moisture. Then sealed in a seamless drawn steel can, and topped by an alkyl resin tower that totally eliminates carbon tracking.

Put this kind of coil . . . this kind of complete ignition system in your car. Whatever kind you drive.

Autolite . . . the one name for spark plugs, batteries, filters, shock absorbers and complete ignition systems.

Autolite 





MARK OF EXCELLENCE



Toronado: One-of-a-kind car in a carbon-copy world.

If a run-of-the-mill machine is all it takes to light you up, you're in luck. You have hundreds to choose from.

If, on the other hand, you're after something as different and individual as you are, you're looking at it.

Toronado, the FRONT-WHEEL-DRIVE youngmobile from Oldsmobile.

There really is no alternative.

ENGINE

Type.....	Rocket V-8
Bore x stroke, inches.....	4.125 x 4.25
Displacement, cubic inches.....	455
Compression ratio.....	10.25-to-1
Bhp.....	375 at 4600 rpm
Torque, lb.-ft.....	510 at 3000 rpm
Carburetion.....	4-bbl.
Built-in Combustion Control System provides constant carb air temperature.	
Battery.....	75 amp-hr.

Available: Force-Air Induction System. Includes high-output cam, dual exhausts, 400 bhp at 4800 rpm.

DRIVE TRAIN

Transmission..... Turbo Hydra-Matic 3-speed with higher output torque converter, 180° forward power transfer.

Available: Floor shift mounted on full-size console.

Differential..... Low-friction bevel gears.

Axle ratio..... 3.08-to-1 standard

CHASSIS

Suspension..... Front stabilizer, rear leaf springs, four rear shocks.

Steering ratio..... 17.5-to-1

Tires..... 8.85x15"

Brakes..... Power, self-energizing, self-adjusting.

OTHER AVAILABILITIES

Power front disc brakes. UHV Transistorized Ignition. Chrome Open-Spider Wheels. Custom Interior. G.T. pinstriping. Bucket seats. Vinyl top. Stereo tape player. Many more.

GENERAL

Wheelbase.....	119.0"
Overall length.....	211.4"
Overall width.....	78.8"
Overall height.....	52.8"
Curb wt. (lb.).....	4472
Tread.....	front 63.5", rear 63.0"

SAFETY

And all the new GM safety features are standard, including energy-absorbing steering column, seat belts for all passenger positions, many more.

Olds Toronado: The front-wheel-drive youngmobile.

After all others failed, one individual's common sense has finally designed a cooling system for the Sixties; a time when most people don't realize that temperatures inside radiators are dangerously above boiling.

A cooling system that works

BY JULIAN G. SCHMIDT

Just a couple of months ago we criticized that fleet of 1968 sedans we used on a cross-country test for not having adequate cooling systems to cope with modern automotive demands. Now, suddenly, what amounts to a sort of mechanical-minded Messiah—a Mr. W. C. "Pete" Avrea of Placentia, Calif.—has appeared with an imaginative solution that he devised all by himself and then filed for patent, after Detroit's hundreds of thousands of red-tape-encrusted mighty-minds have failed.

Several facts stimulated him. First, he saw a Work Injuries List released by California's Dept. of Industrial Relations that shows 14% of all lost-time injuries in service stations result from burns and scalds, almost all from overheated radiators. Next, he noticed that a new safety regulation requires that all cars be equipped with "safe" radiator caps. Third, automobile cooling systems operate ridiculously below their capacity—a debility that can be attributed almost completely to the haste and neglect of mass-production techniques. But, most important, Pete's own car overheated once too often, burst a hose, and required him to embark on several half-mile peregrinations for refill water before he could drive on.

His invention is known as the Coolant Recovery System. Being scientifically cynical, we weren't about to be wimply by either a patent office or

Detroit, should both deign to adopt it, so we asked Mr. Avrea if we could evaluate it under the most demanding conditions possible—namely, on a staff member's personal car used daily in Los Angeles commuter traffic. He didn't wince at this agonizing ordeal, but went right to work and installed the system on a '66 Olds Cutlass with a 350-cu.-in., 250-hp., 4-bbl. V-8.

A neat panel of gauges—one for temperature, one for pressure—was attached to the bottom of the dash. First, readings were taken for the normal cooling system. Then, the Coolant Recovery System was connected, and readings were recorded for it. Results were amazing, and every gauge on the car attested to the logic behind the Coolant Recovery System.

Essentially, the logic is this. When the cooling system is topped up, as it should be, high pressures are both necessary and desirable to cope with the high temperatures of the water. However, these high pressures are an obvious disadvantage to the thousands of people scalded and disfigured each year when they remove the radiator cap to check coolant levels. And when considering the inadequacies of modern cooling systems, the problem grows vastly more complex.

For example, let's examine a conventional system on a cold engine, the radiator of which is filled to the top. Start the engine, the coolant expands and pressure increases, opening the exhaust valve in the radiator cap and expelling enough water to bring the system to equilibrium. By the time an optimum operating temperature is reached, the coolant lost can amount to as much as two quarts. When the engine is stopped, the coolant contracts, and the two quarts of coolant that were expelled are now replaced with air.

This new condition is detrimental to proper cooling in several ways. The amount of coolant has been reduced, so it cannot carry off the heat as efficiently. The coolant is aerated, so it cannot conduct heat directly from the

metal. Pressure build-up and ultimate pressure are both reduced drastically, as are boiling point and temperature control. Finally, with air in the system, rust will occur.

As simple as it may be, Mr. Avrea's Coolant Recovery System eliminates all these problems, and all it consists of is an overflow recovery reservoir of approximately 2-quart capacity (such as a windshield washer reservoir), an air tight connection between the radiator overflow and the recovery reservoir, and a short, transparent section of durable plastic tubing spliced into the return radiator hose. Fabricated into this transparent section is a common air valve stem.

After these pieces are installed, and all hoses are lowered, if necessary, so that the overflow is—as it should be—the highest point in the system, the installation is complete, sealed and air tight.

To fill the system, one simply connects a common air chuck to a water hose and uses the valve stem installed in the radiator hose for inserting the water under pressure.

Now, when the engine is operated and the normal pressure build-up and expulsion of coolant occurs, the coolant simply transfers into the recovery reservoir, rather than onto the ground, so that when the engine is stopped and coolant contraction begins, the same coolant that was expelled is now drawn back into the system. No air has entered, and the system's optimum capacity, pressure and efficiency has been retained.

All of the previously mentioned dangers are thus eliminated. Plus, with the transparent slicing section, coolant level can be checked visually and immediately; some can even be added without removing the radiator cap.

The system is proven, and we can attest to that. In fact, one installation has operated for more than 20,000 miles without requiring coolant to be added, and it is still doing so without even a faint indication of rust. Simplicity... it works every time. /MT

TYPICAL READINGS TAKEN FROM MOTOR TREND RECORDS

WITHOUT COOLANT RECOVERY SYSTEM

MILES	MINUTES	MAXIMUM PRESSURE	MAXIMUM TEMPERATURE	TRAFFIC CONDITIONS
2	9	10 lb.	170	heavy
8	30	7	280	heavy traffic jam
2	10	5	260	heavy city traffic
3	6	0	180	light
2	20	11	265	heavy traffic jam
7	30	11	165	moderate

WITH COOLANT RECOVERY SYSTEM ATTACHED

11	30	14	160	moderate
15	50	13	160	heavy traffic jam
3	20	12	155	heavy city traffic
8	45	14	155	very heavy
5	60	14	160	very heavy
9	25	14	150	heavy city traffic

Closest thing to a Corvette yet.

Special order Z/28 and you get a Camaro that comes on like Corvette... for a lot less.

Dual exhausts with 2 1/4" diameter pipes and deep tone mufflers.

3.73 rear axle. (Ratios up to 4.88 available when you specify Positraction.)

Big, bold stereo rally stripes. (No mechanical function, but having great psychological value.)

Air spoiler available on request.

15" x 6" wheels and E70 x 15 special nylon cord "Wide Tread GT" high-performance tires.

Limited production 302-cu.-in. V8. 4.0 bore, 3.0 stroke. 11.0:1 compression ratio. 290 rated bhp at 5800 rpm. 290 rated torque at 4200 rpm. Carburetion: 1x4 Holley rated 800 cfm mounted on special tuned aluminum manifold. Special cam. Solid lifters. Curb weight: 3220 lb.

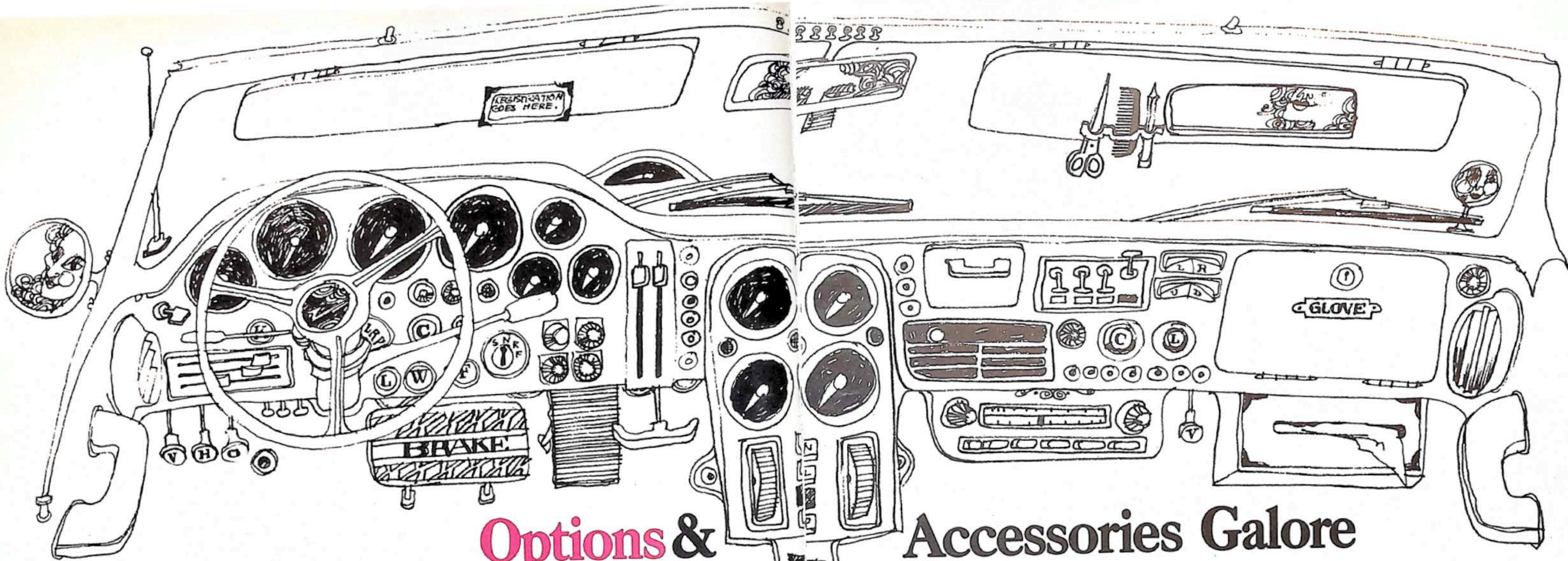
Heavy-duty radiator. Temperature-controlled fan with dual pulleys for fan and water pump.

4-speed and power disc brakes for you to order.

21.4:1 quick-ratio steering. 17.9:1 fast ratio also available.

The Z/28 **CAMARO** 





Options & Accessories Galore

linings, undercoating, economy rear axle and so forth. There are loads more items along this line, all costing amazingly little—\$3-\$20 each.

The bigger, more common accessories, though, do have the built-in advantage of making your car more valuable at trade-in time, while the little ones usually don't. Some actually pay back more when you sell your car than you paid new. For example, power steering, which costs \$84 initially in a 1966 Mustang, adds \$165 to that car's used value today (according to the latest available Kelley Blue Book). Power steering is one option that almost always returns more than you invested. Air conditioning can return 90% (in a 2-year-old Imperial) to about 40% (in a 2-year-old Chevrolet), but in all cases this accessory levels off at an average of about 33% after three years. In other words, on a yearly, pro-rated basis, you pay relatively little for this initially expensive option. Same goes for automatic transmission, 4-speed, radio, and even the now-popular vinyl roof. Then too, these items make a used car that much easier to sell outright if you're of that mind.

When you walk into a new-car show-

room, the salesman will logically try to steer you to one of the cars his agency has in stock at the moment. It might not list precisely the options you'd choose if you were given carte blanche, but the salesman "can make you a better deal" on an in-stock car than on one he has to order from the factory specially for you.

His claim about a "better deal" contains a certain grain of truth, because his agency already has money invested in a car in stock. Thus he's more anxious to dispose of it—more willing to deal. Still, unless the agency has a car with just what you want, make a special order anyway. You'll have to wait 6-8 weeks for delivery, but the wait can well be worth it. Why pay several hundred dollars for things you don't want just because they're there? Conversely, why take a car that doesn't have what you do want just because it's there?

Ordering just the right options, though, takes a good deal more thought than most people realize. Take a case in point:

A young bachelor we know recently had his cap set on a particular make of 1968 sports-personal car. He valued all-

out performance above most other considerations, so he ordered his new ponycar with the biggest engine offered, with the close-ratio 4-speed gearbox, a 4.44 rear axle, fast-ratio manual steering, disc brakes and the handling package. All this sounded great on paper, but he was grossly disappointed after he'd driven the car awhile.

Not only did the engine scream at 60 mph on the freeway (because of the low rear axle), not only did it drink unbelievable amounts of gas, but he found he had so much low-speed torque that the big engine actually hurt his quarter-mile times. His street tires merely smoked off the line. He couldn't break 15 seconds, whereas identical cars with smaller engines and automatic transmissions could and did. An automatic would have helped his acceleration, too, because the close-ratio box was all but useless in 2nd gear—he could leave it in 2nd for only a 13-mph span.

Our friend found, too, that his quick manual steering made turning (with the heavy engine) uncomfortably difficult. Power steering would have given him the same overall ratio and saved him a

lot of muscle in the process. The front disc brakes couldn't do their job in hard stops because the rear drums continually locked up due to the heavy engine up front. Ride with the handling package turned out to be much rougher than he'd expected.

In other words, this young man spent some \$1500 tailoring an elaborate dud. Nothing went with anything else. Had he ordered a smaller engine, stickier tires, a higher rear axle, another transmission, or power steering, his purchase would have turned out happier.

The lesson to be learned from all this is that you shouldn't buy an optionized car until you've actually driven one (a demonstrator or a friend's) that contains what you're contemplating ordering. Drive this car for at least a day if you can so you can really make up your mind.

On the average, you pay the same markups on optional equipment as you do on the car itself. In other words, compacts, which have average markups between wholesale and retail of 19%, have an average option markup of 19% as well. Luxury cars are marked up about 25% between wholesale and list—both the car and its options. So you can expect a higher-priced car to

come with more accessories at a proportionately lower cost.

Dealers often tell you they make no profit on accessories, that they toss them in at cost just so you'll buy the car itself. This usually isn't true; they do make a profit on accessories, but it's often less in percentage than on the car.

And in cases where what we normally consider optional becomes standard (air conditioning in the 1968 Ambassador, for example, or the swing-away steering wheel in the Thunderbird), don't kid yourself—you pay for these, too.

It's interesting to note from a purely theoretical standpoint how certain options have grown in popularity these last few years. To put it into tabular form, here are percentages* of specific types of equipment ordered with new cars in the given years:

OPTION	1961	1964	1967
Automatic transmission	72.8%	77.5%	86.9%
V-8 engine	52.9%	69.0%	84.2%
Power steering	38.4%	51.9%	74.7%
Power brakes	22.8%	25.6%	38.5%
Air conditioning	8.1%	17.1%	38.4%
Power windows	6.9%	13.0%	16.7%

For 1968 these figures promise to soar at an even faster rate. Through the first

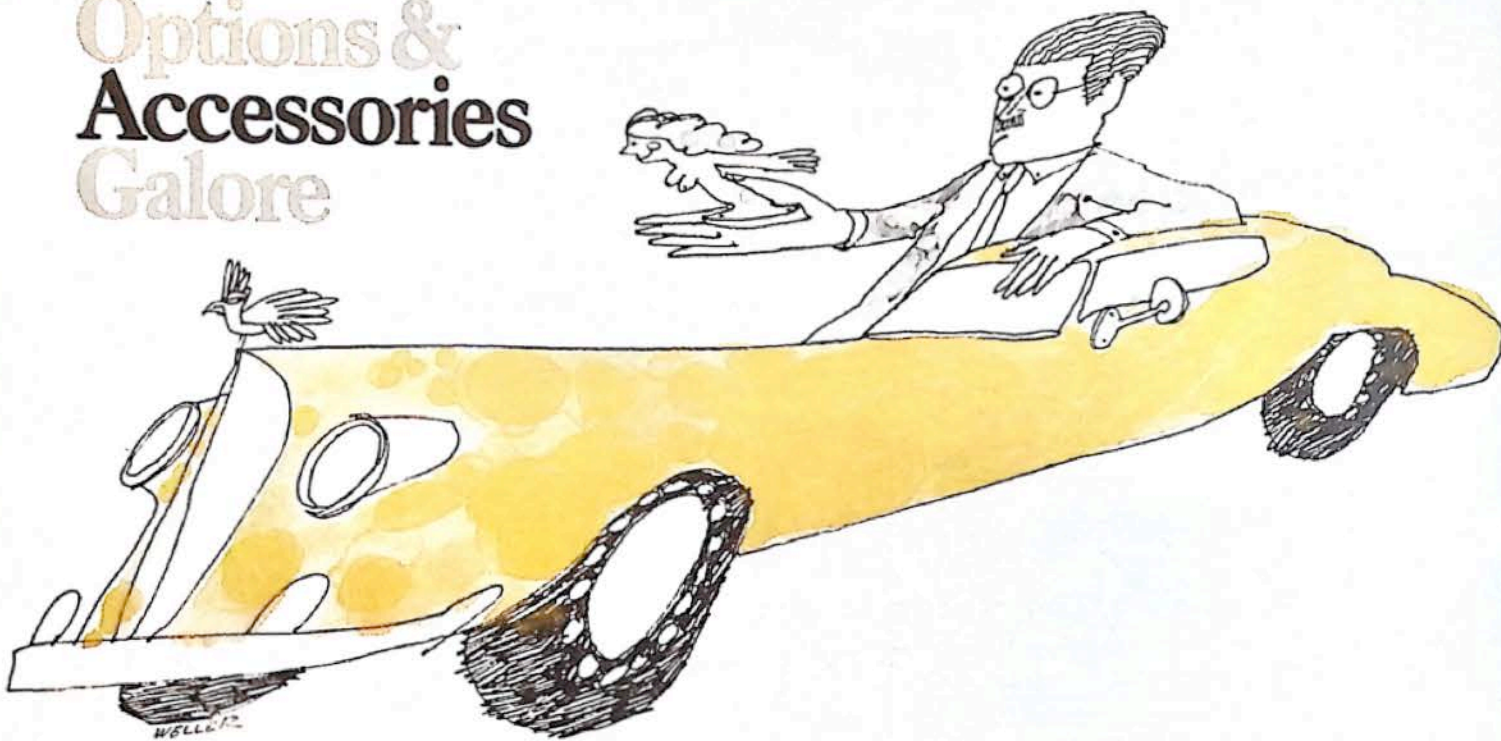
quarter of Ford's '68 model production, for example, automatic transmissions were installed on 97% of all Fords. Power steering optional choice increased 30% over the same period in the previous year, and power brakes—on 43% of all Ford cars—were up 14%. Air conditioning was ordered on almost half of all standard-size Fords, up 16% over '67.

You can see from all this that we're becoming an increasingly option-conscious nation. Black as the only color will never do again. And as it happens, automakers are forever busily adding new options to an already fantastically complicated array. Stereo tape systems, rear-window washers and collapsible spare tires are only the latest in what looks like a never-ending spiral of choices.

To cope with this spiral, 1) know what's offered, 2) choose carefully, basing this choice on your needs, your budget, and what you think you'll get back at trade-in time, and 3) don't settle for a packaged car-with-options just because the dealer happens to have it.

*Figures courtesy AUTOMOTIVE INDUSTRIES Magazine, Chilton Publications, Philadelphia.

Options & Accessories Galore



What options are to a new car, accessories are to an old one. In many ways this oversimplified comparison is valid, because the same basic human drives are involved: the desire to add pride to possession, the wish to self-indulge in comfort and convenience, the urge to taste the thrill of improved performance.

If a new-car buyer is sure he knows what he wants when he signs the contract, then he's well on his way to wheeled happiness. But if he is governed by economics or will power at the emotional peak of purchase, then he may join the ranks of accessory buyers later—and give in to some aftermarket

hang-on item he wished he had ordered on his new car originally. Or he may one day become entranced by a new type of add-on that wasn't offered as a new-car option.

To a used-car owner who realizes that he can't or isn't quite ready to buy a new automobile, the infinite array of accessory items offers an equally infinite number of ways to give his old set of wheels a new lease on life.

Almost as varied as the types of available accessories are the sales outlets at which they can be purchased (see list on this page). In addition to these, of course, are the many accessory advertisers in

MOTOR TREND, whose ads inform as well as entice.

Obviously, to try to present examples of all of the innumerable kinds of accessories—and their countless specific sources and sales points—would be an encyclopedic undertaking, beyond the scope of our editorial space in any given issue. For this reason, we can include only a representative sampling of some of the new or unusual accessory items now available. There are many more for your consideration waiting out there.

But for starters in ways to add sparkle, safety, comfort, convenience and performance to your car—new or old—read on...

Where to Look for (and Buy) Accessories:

Auto Supply Stores
Speed Shops
New Car Dealers
Mail Order Houses

Automotive Sections in Major Department Stores
Yellow Pages
Tire Stores

Custom Car/Hot Rod Shows
Specialty Accessory Stores
Service Stations
Diagnostic Centers

Performance

There's an old speed-shop saying that goes, "A hot rod runs on money, not on gas." To a certain extent that's true, because to give a car more performance merely means feeding it more money, and the faster the car gets, the more cash it'll take to get it faster still.

But what's important isn't how much you spend, it's how. You don't have to go broke installing horsepower if you're smart about it. The idea is to plan your performance program before you start so you won't

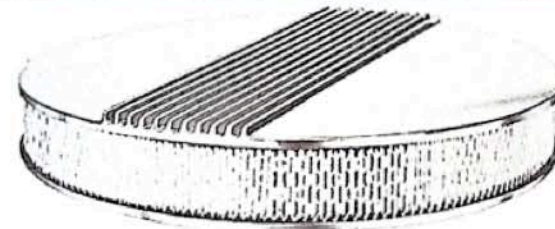
have to replace what you've already bought.

So many high-performance parts and accessories are available for cars today that a mere listing of the major ones would take pages (after all, big catalogs are written for just that purpose). Bolt-on items for reasonable performance improvements at reasonable cost begin, almost always, with multi-barrel manifolds and carburetors. Hundreds are offered. Along with better intake systems, an investment in headers or other free-breathing exhausts makes a wise choice. For those who don't mind grease under their fingernails, a hotter cam and kit make sense. From here, the selection and price go upward only, and the postage invested in a J.C. Whitney, Honest Charley, Weiland, or other catalog can prove very profitable.

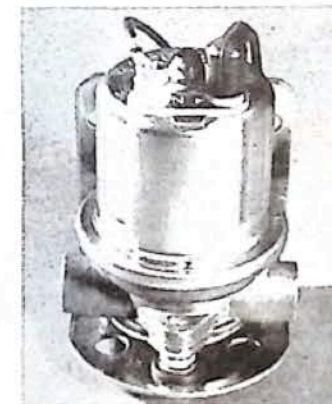
Too many inexperienced speed enthusiasts believe, though, that performance improvements mean only engine modifications. Not so. If you're

going for power, you have to balance it with power to stop and power to turn your car. Several excellent disc-brake kits are now being made, along with extra-duty and sintered metallic brake linings. These aren't items you can casually show off to your friends—unfortunately they're mostly hidden—but they're probably more important than a hot and jazzy looking mill.

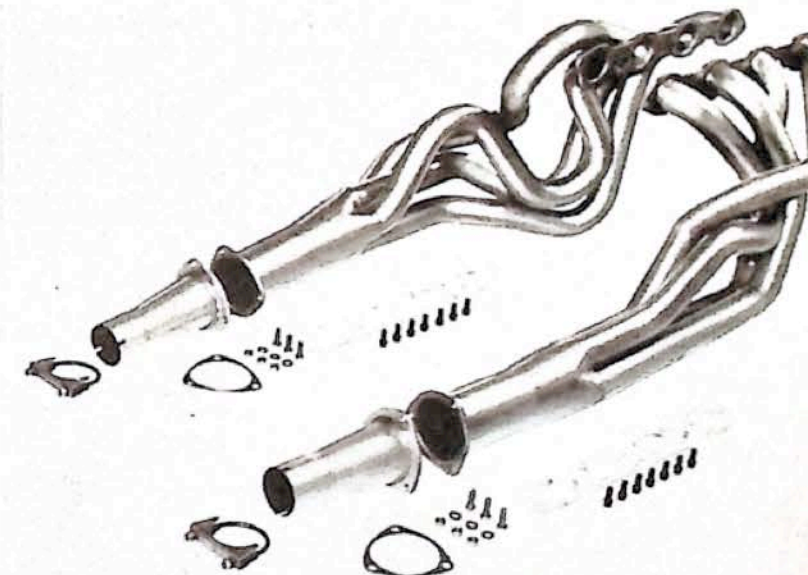
In planning your performance program, don't overlook the importance of heavy-duty suspension and handling equipment. Stiffer shocks, perhaps a heavier front stabilizer bar, maybe traction bars and a quick-steering Pitman arm will pay for themselves in safety as well as performance. Tires, too, make all the difference, and it's vital to have a set that'll stand the strain of a blood-and-guts engine. Normal street tires often can't be expected to take high speeds and the greater braking and cornering loads laid on by more power. So think about the supersport red-stripes and even



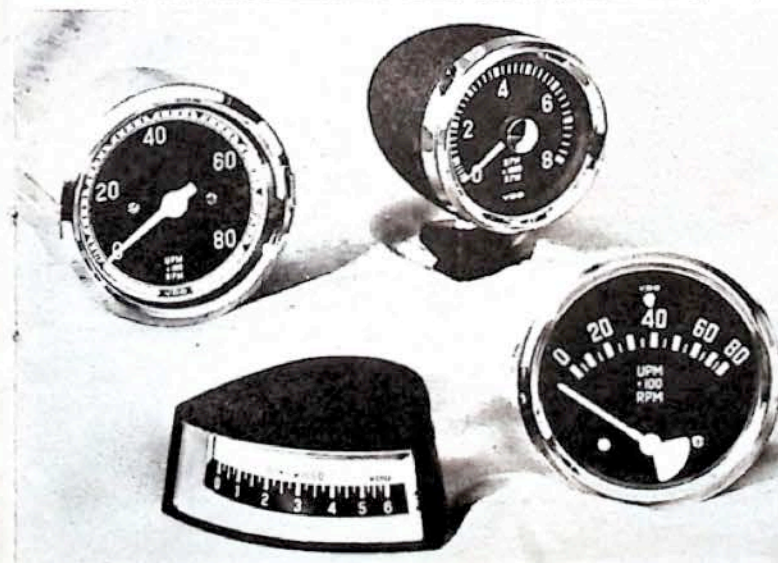
Polished aluminum 14-inch air cleaner by Cal Custom is available for either 2- or 4-bbl. carbs. It has no wing nuts. Top simply spins on. It comes with CFM rated flame-resistant, high-filtration, non-restricting paper cartridge. Also in 9-inch, with reusable polyurethane filter.



Carter's in-line electric fuel pump is shock-mounted for 12-volt systems and is designed for a very high fuel handling capacity. It puts out 72 gallons of fuel per hour free flow and has a shut-off pressure rating of 7 psi.



Headers for the 396/427 Camaro are made for bolt-on installation. The Nickeyl Bill Thomas headers have equal-length pipes for good extraction. A swivel-type connector allows dual use for either street or strip by simply removing three cap screws and swiveling the connector aside.



VDO transistor tachometers for use with either 4-, 6-, or 8-cylinder engines operating off 6- or 12-volt systems are available from Robert Bosch Corp. for either 6000 or 8000 rpm ranges. Full dials are 3 1/8-inch in diameter.

The Volkswagen Super Scoop is a fiberglass air scoop that is attached over intake vent holes. It uses the air stream to produce a ram effect into the engine area for cooler oil temperature. Purveyors of Super Scoop also claim it serves as a spoiler.



Options & Accessories Galore continued

the radial plies, both of which pay for themselves eventually although they're more expensive initially.

Most important, though, is not to feel you have to invest all your money all at once to get the performance you're after. By making your hop-up plans before you start, you can build and add parts as you go along, so eventually you'll arrive at the power level you're after—rather than shooting everything at once and ending up with half, then having to throw that half away as you realize you'll have to replace nearly everything you've installed to start all over again.



Sound

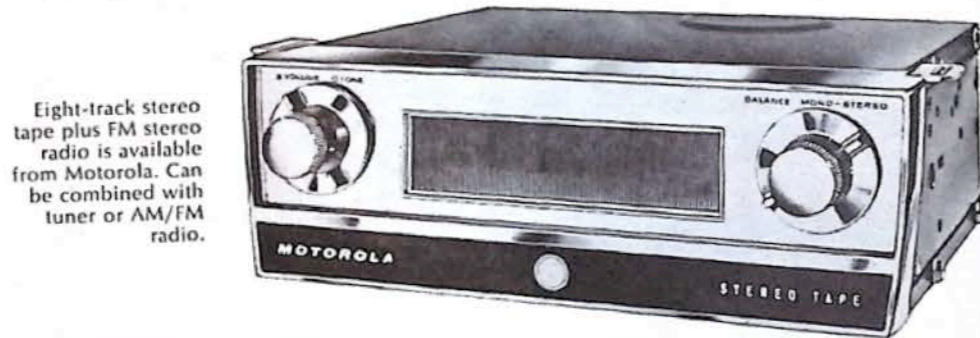
The sonic boom—that is, stereo—moved out of the home a few years ago and climbed into the car. Auto stereo tape and radio systems currently rank among the hottest-selling items on accessory-house shelves. Stereo has proved so popular that Detroit lately began cashing in on the boom by offering factory-optional systems for new cars. But if your car isn't new, don't fret.

Among the sophistications of aftermarket car stereo units are 4- and 8-track players, sets with pushbuttons so you can instantly select the section of tape you want to hear. Then there's channel balance, filtered sound refinements, plus technical innovations only an electronics engineer can appreciate. You can get speakers for nearly every cranny of a car's interior, some looking like Baroque pipe organs. Reproduction is now so good that even a Jeep can be turned into a concert hall (almost).

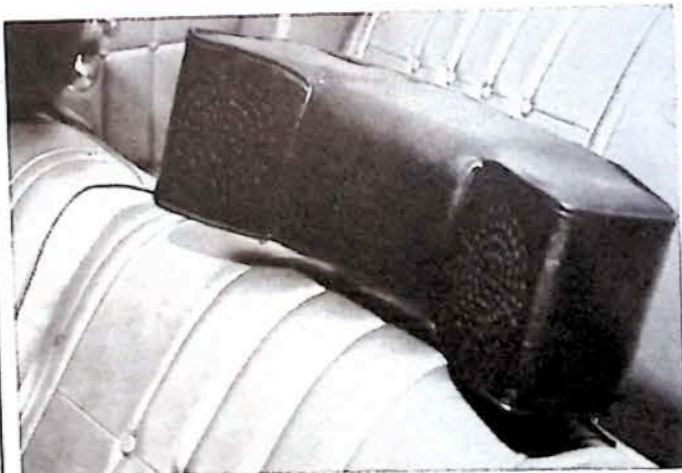
In addition, other listening systems include 45 rpm record players that hang under the dash; AM/FM replacement radios (instead of your old AM set); FM tuners alone that play



Solid state, 5-watt Citizen's Band transceiver built by Amphenol has a distance capability of up to 25 miles. It can be easily attached under the dashboard and used for car-to-car transmission, car-to-walkie-talkie connection. No FCC tests or examinations are required to operate anywhere in the U.S.



Eight-track stereo tape plus FM stereo radio is available from Motorola. Can be combined with tuner or AM/FM radio.



The Cobar stereo headrest uses two 2.35-oz. ceramic magnet speakers capable of handling 8 watts of power. Speakers are backed by parabolically shaped chambers.



A solid-state AM receiver and tape player—Motorola's Sapphire PlayTape I is original equipment for all '68 VWs. It has 8 transistors.

through any AM; short-wave converters; compact, fixed-channel citizen-band radios that let you call for help in emergencies; and much more.

Plug-in TV sets make it possible for passengers to ride in the rear seat and yet not miss their favorite programs. These solid-state sets are so versatile that they play either off 12-v DC car current, off their own battery packs or may be plugged into house current anywhere. They're fine for car, beach, boat and home, all in the same unit.

Then, too, equipment manufacturers haven't overlooked the storage problems entailed in having stereo tape and record systems in cars. Some make very handsome bins, mountable in or on a console or glovebox, to carry tapes and single 45s.

Inverters have been available for some time to convert 12-v auto battery current to 110-v AC. This lets you operate everything from household record players to public-address systems miles from any wall plug. With an inverter, you can not only take your home listening equipment on camping trips and beach outings, but you can bring along everything from movie projectors to your electric toothbrush.

Nearly all hang-on automotive electrical equipment has the added advantage of being removable, so you can switch it from car to car as the

need arises. This way you can enjoy the same stereo set year after year.

In the burgeoning world of automotive electronics, anything's possible. Surprisingly, as more sophisticated electrical systems like the above become more popular, they also become more highly developed, better in quality, and lower in cost. The selection is there. At first, buying a car stereo set, for instance, presents so much variety at so many different prices that it's all but impossible to decide what you want. But by shopping carefully, by listening well to all that's offered, and by comparing advantages and disadvantages, the eventual choice becomes clear.



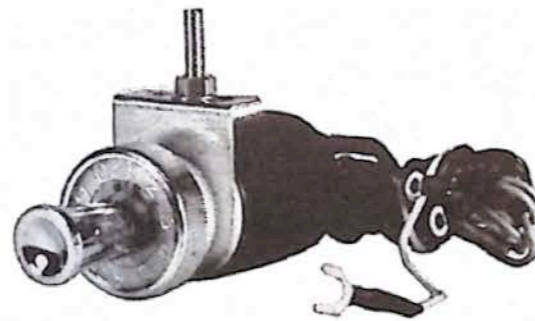
Safety

While in the past, safety aftermarket accessories sold no better than original-equipment safety items, they've picked up rapidly since late 1966. People are now concerned about safety. They want to update their older cars to make them as safe as the 1968s.

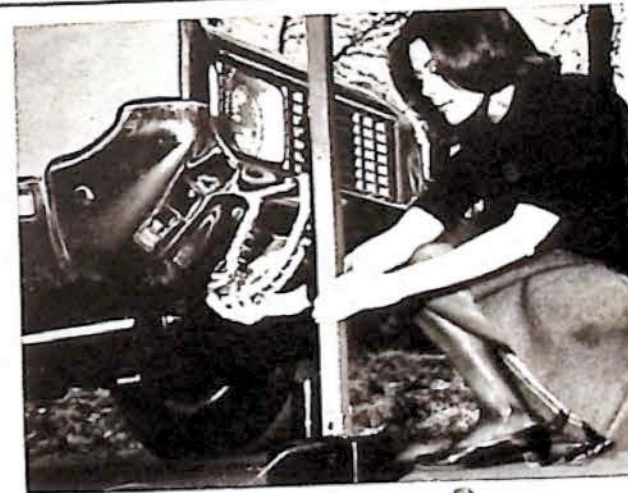
To this end, it's now possible to buy press-on sidemarker reflectors that look just like those required on 1968 vehicles and do nearly the same job. Headrests which won't be required from Detroit until next year, enjoy brisk over-the-counter sales. Purchases of seat belts for rear-seat passengers and even shoulder harnesses for older models are up several hundred percent over the 1965 level. Four-way flashers, back-up lights, outside rear-view mirrors, and other now-required new-car safety equipment provide a booming business in parts houses across the country.

Wrecking yards report a healthy increase in the sale of late-model padded sun visors and prismatic rear-view mirrors to owners of older cars. Los Angeles police claim that one of the more popular items being stolen from cars nowadays are the tall "sarcophagus" seats out of 1968 Volkswagens.

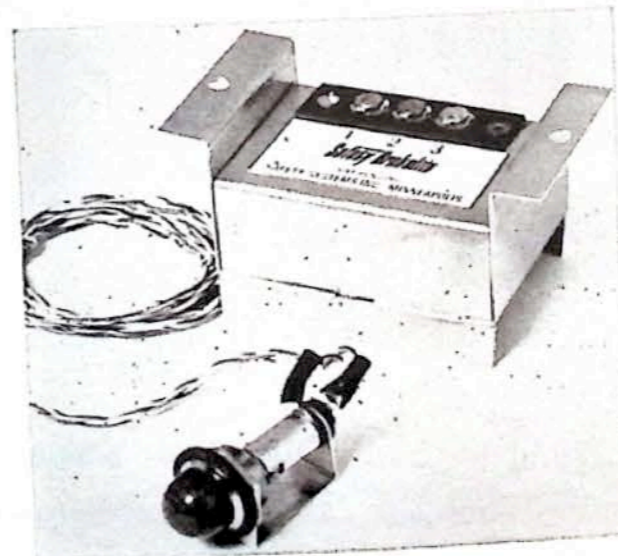
Nor is the safety boom limited to amassing those gadgets required in new cars. Water-filled bumpers, small fire extinguishers, wide-angle inside



Combination burglar alarm and theft-proof lock, called Securo-Guard, will prevent car from starting by jumping or master key. Tampering sets off horn.

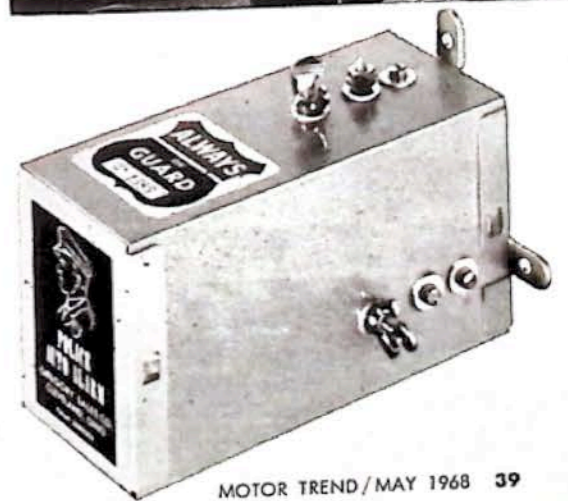


By plugging Lectorjack into cigarette lighter socket, the car can be lifted. It only fits a 12-volt system. Battery drain is claimed to be quite insignificant.



A pulsating brake light, made by Safety Systems, Inc., makes braking obvious from behind. Dash-mounted light indicates operation.

Burglar alarm has both low price and easy installation. Any disturbance to car sets off Police Auto Alarm and honks horn.



Options & Accessories Galore continued

mirrors, emergency first-aid kits, and suspension boosters for trailer haulers are all becoming more popular.

Among the cleverer safety inventions are devices that sound the horn when you shift the transmission into reverse, so pets and kids can get out of the way when you back out the driveway. Crash helmets disguised as daily-wear hats (for both men and women) provide crash protection while still giving a fairly normal appearance. Ice-scraping windshield wiper blades work along with spray-on ice-melting solutions and ice-cutting washer fluids to keep forward visibility clear.

Drivers are becoming more aware of their cars' handling, too. Easily adjustable shock absorbers, overload springs of various types, chamber compensators, and special tires all help in this area.



Comfort

There's no end to the comfort and convenience devices offered these days. One of the more popular, covering an increasingly narrow price spread, is the under-dash air conditioner. Modern hang-on units take up less space than those made a few years ago, and they now cool as well as factory-installed air. They also have the advantage of being transferable from car to car.

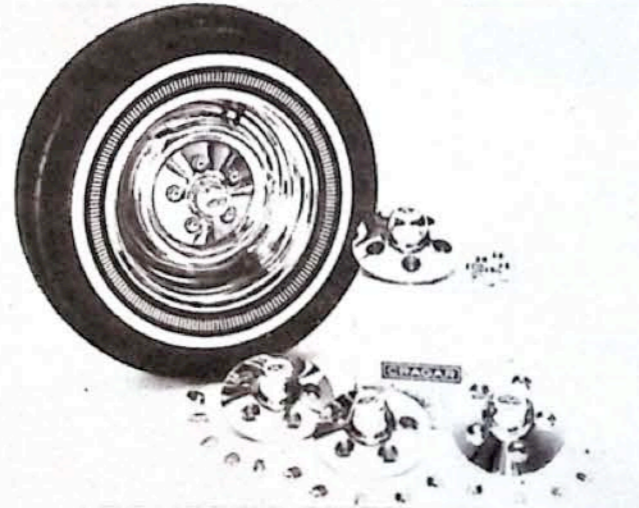
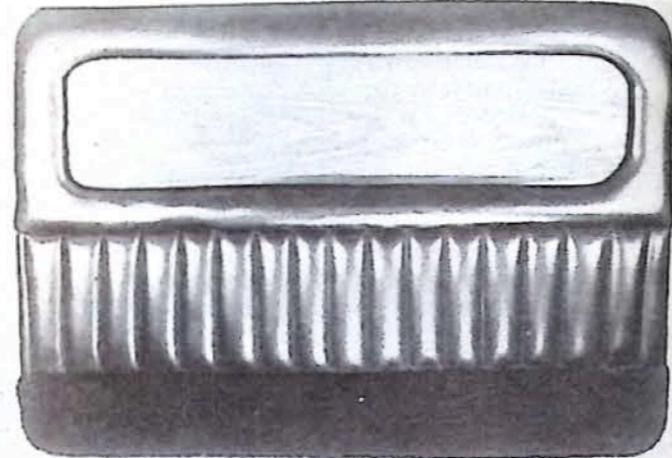
If you missed the factory's vacuum trunk opener, it's available as an after-market accessory in electrical form. Or if you need tinted windows or a tinted windshield band, spray it on. Roof racks and trunk racks and interior storage bins of every description are available from parts houses.

How about a bottle warmer for the little nipper? Or a diminutive under-dash refrigerator? Or aluminum blinds for that too-big rear window in your



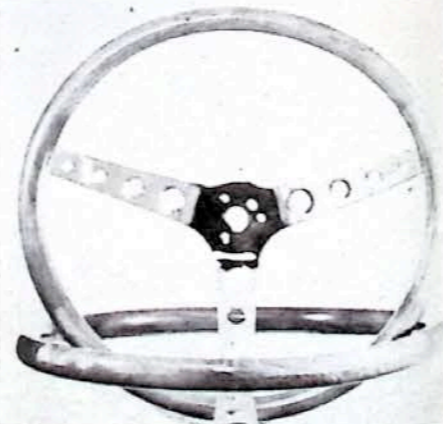
Keystone has a new Kustomag Klassic center chrome plated mag wheel. It is triple plated with 50% more corrosion-resistant chrome set against a velvete background. The center is die-cast aluminum. The wheel is also machine aligned to within .005-inch and pressure-blasted to inhibit stress and corrosion. Nearly all sizes up to 6-inch rims.

Front door and rear quarter panels of '60 through '68 VWs can be fitted with Intac's foam-padded, leatherette, tuck and roll pleating with walnut highlighting. The walnut strips are heavy-duty and mar-proof. Kick panels along the bottoms are also designed for durability. Panels may be ordered separately in front and rear pairs and are installed with present clips.



Because some pseudo-sporty-car fans can't quite become accustomed to the "real" look of real, bare wheels, Cragar has come up with a disc-type wheel cover that is actually fastened onto the wheel under the lug nuts. You simply remove the lug nuts, add the center cover, then replace the nuts. The cover is heavily chromed over die-cast zinc alloy. They are available for 14- and 15-inch Fords and Chevys.

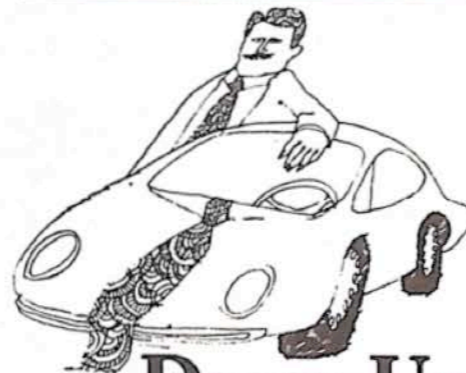
A 13-inch custom steering wheel with a walnut rim is now being produced by Ansen. It has a 3-spoke dish design with chrome-plated ventilated spokes and incorporates a 1-piece spoke construction with a heliarc welded solid steel ring and 12 walnut laminations in the rim for strength. Available for most domestics and imports.



fastback? Or a vanity case and mirror to clamp onto the sun visor?

Care for an ash tray that lights your cigarette for you by taking the first puff? How about one that mounts anywhere so you don't miss those vanished vent wings that didn't come with your flow-through ventilation system? Or how about that windshield squirter you forgot to order before you took delivery of your new car?

Now's the time, too, to buy that little vacuum cleaner that plugs into your dashboard—they've come way down in price. So has the hose brush that saves you about half an hour when you wash the car. Or that special chuck that lets you put a wax buffer into your electric drill? There's plenty to help you save your back these days.



Dress-Up

Walk into any auto parts store and you're immediately struck by the fantastically opulent array of dress-up accessories. The walls and counters leap up at you with the glitter of bright textures and handsomely designed metallic shapes. Never before has the automotive cosmetics business offered greater selection, better quality, or more tasteful and useful customizing equipment than now.

Until a decade or so ago, the general quality of dress-up equipment remained relatively questionable. Today, though, cut-throat competition has brought about excellent workmanship, and castings or forgings for such items as valve covers, mag wheels, grille kits, carb scoops, etc., are first-rate. Chrome plating, brushed aluminum, crackle, and other finishes no longer deteriorate after a few weeks or months. In this respect, there's been a true revolution in the accessories field.

There's been another revolution in the tastefulness of aftermarket customizing goodies. While some of us can remember the day when pot-metal stars and bolt-on portholes were all the rage, today's accessories tend to be more restrained, cleverer, more subtle, and more useful than ever before. For example, breakthroughs in the tech-

nology of adhesives have made possible the development of protective chrome body trim strips that not only look sharp but also simply press on—no holes to drill or align. These strips protect the paint from door-opening dings, so they do more than help looks. Adhesives have also given rise to reflective GT stripes, to wood-grain and metalflake appliques, to stick-on scuff pads, etc., which make it possible for anyone to quickly individualize his car.

Often it costs no more (sometimes less) to buy dress-up accessories than to replace worn original parts. As an example, why replace worn standard pedal pads when chrome-and-rubber dress-up pads cost no more? Why replace a cracked or gouged steering wheel with another from the factory when there's such a wide selection of handsome specialty wheels being offered?

Zeroing in on the interior, it's now possible to order floor carpeting that

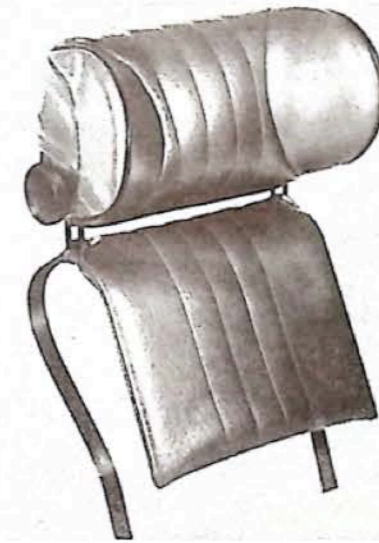
fits just like an original. And pleated seat covers that look better than original in many cases.

To protect carpeting while adding a touch of complementary color, you can have a rainbow choice of rubber/vinyl floor mats in solid hues or see-through styles, both clear and tinted—in individual mats or one-piece wall-to-wall.

Ofttimes it's possible to revive faded vinyl or leather upholstery—even kick panels and headliners—by spraying them with the nearly infinite selection of pressurized paints now available. Vinyl sprays even make it easy to change the color of your car's interior, and crackle paints leave worn dashboard surfaces looking better than new.

In the more expensive items like mag wheels and fancy wheel covers, it's often possible to switch them from car to car when you sell or trade your old one. So on a pro-rated basis, they're less costly than you think.

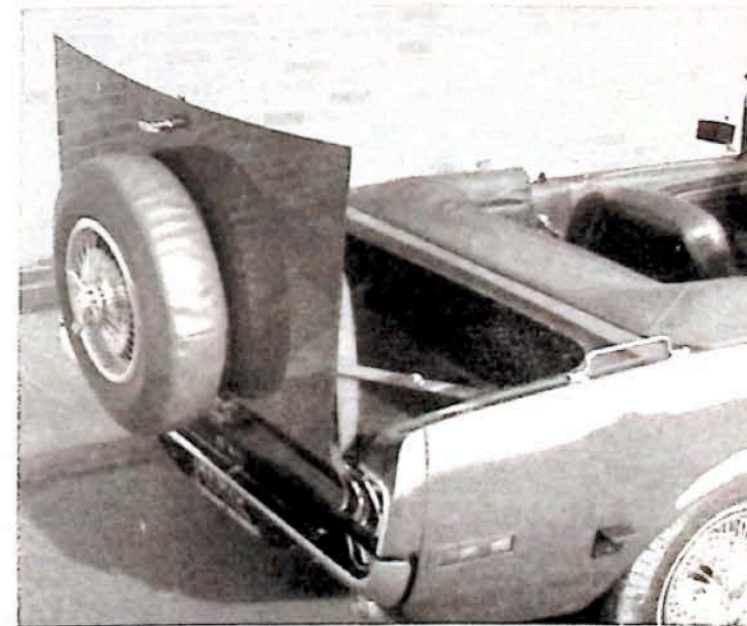
— Michael Lamm



An adjustable, padded headrest by Columbia is said to be anatomically contoured and designed to fit every car. It can be adjusted up, down, backward or forward. It's available in black, brown, red.

Habny's Posture Support is a foam cushion molded for proper back support. It is available in a durable vinyl, in red, black or beige. The cushion presses against the lumbar curve to relieve fatigue and stiffness.

The rumble seat has once more come of age with Autocralt's unit, complete with vinyl seats, matching apron and backdrop, full carpeting, continental tire kit with wheel cover, seat belts and anchors, chrome-plated assist bars and hardware, T-handle lock kit, chrome-plated hinge and rubber steps. It is claimed that the "rank amateur" can install it easily.



Text and Illustrations by Robert Cumberford

Throughout the history of the automobile we have seen steady adoption as standard equipment many items that once were accessories or options. You might think that this would lead to a state of affairs in which there were no more options to add, but car owners are always able to find something else to add to make their own car different from all others of the same type. Who would have thought, just five years ago, that hundreds of thousands of special wheels would be sold as aftermarket accessories? So, no matter how many fabulous improvements become standard equipment, we can look forward to imaginative options from the manufacturers and unheard-of accessories from aftermarket specialists.

What will they be? It's hard to predict in this area, but it seems clear that the greatest efforts will be in the application of electronics technology to the automobile. With the rapid development of integrated circuit techniques, in which a single chip of crystalline material serves the purpose that once required a suitcase full of vacuum tubes and transformers, extraordinary things become possible at reasonable cost. Not so reasonable that manufacturers will want to put them in every car, but enough so that you will be tempted to buy.

Will you get showroom fever from an electronic parking device? You'll just pull up alongside a parking spot, punch the "Parking" button, and the car will smoothly park itself. Remember to select Left or Right first, or you may be embarrassed when you move into the middle of the street instead of in toward the curb!

A small integrated-circuit computer

could monitor all the fuel that goes into your tank, and read out cumulative mpg over the life of the car plus the current rate of use. It would also serve as a double-check on mileage driven—a very useful device for a traveling salesman. He would just note the total gallons used at the end of the year, and his tax work would be much reduced.

Or a multi-sensing computer, only slightly more complex than the VW fuel injection "brain," could keep tabs on the condition of the points, plugs, oil contamination, oil level, exhaust gas temperature, anti-freeze effectiveness... anything you keep track of in your head now. And when any kind of work or service was needed, a small screen on the panel could light up and tell you what to do. The useful life of your car would probably be increased by five years if it were always kept in perfect condition. Would you pay \$98.95 for a device to tell you how to do that? If you don't want to know all this, you could simply drive into a service center, and their large-scale computer could interrogate your car's sensing units. The service manager would receive a worksheet from his print-out unit, and the days of "It goes wheep-plunk-ding at 33 mph" would be gone forever.

Telephones in cars are enormously useful. But they are custom jobs all the way today. Will the manufacturers offer built-in telephones that can be connected to your home or office number? Or will the aftermarket come up with tailored packages for individual cars, as they have done for air conditioning?

What about adjustable steering ra-

tios? Maybe a "His and Hers" set-up, with quick steering for fast driving, slow for town and parking and turnpike runs?

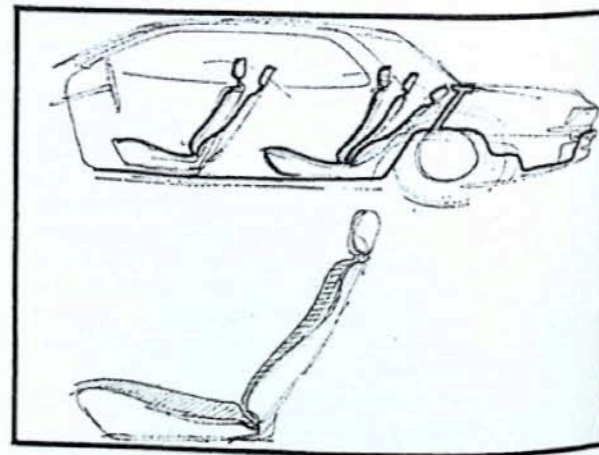
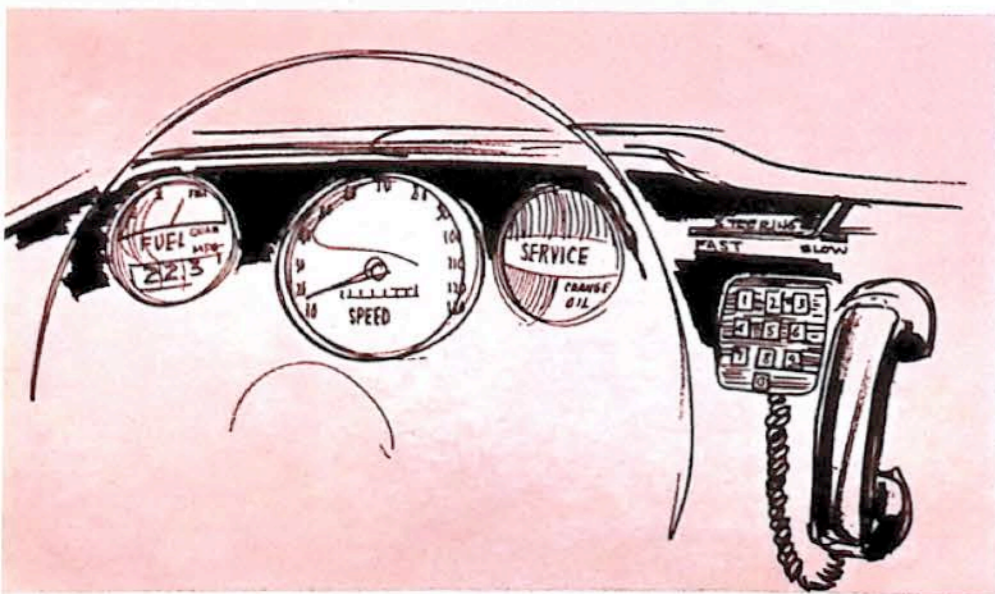
Or electrical heating units for the engine, gearbox, axle, seats, steering wheel, windshield? If you live in cold country, you might be willing to pay handsomely for a unit that did all these things if you remember to plug the car in at night.

An option for those people who normally buy every "power" extra on the list might be a second engine. Why not have an auxiliary power unit driving all the power-robbing accessories? If it ran at a constant speed it would have a long useful life, and the prime mover wouldn't have to be so big, complex, or fussy. With a surplus of power

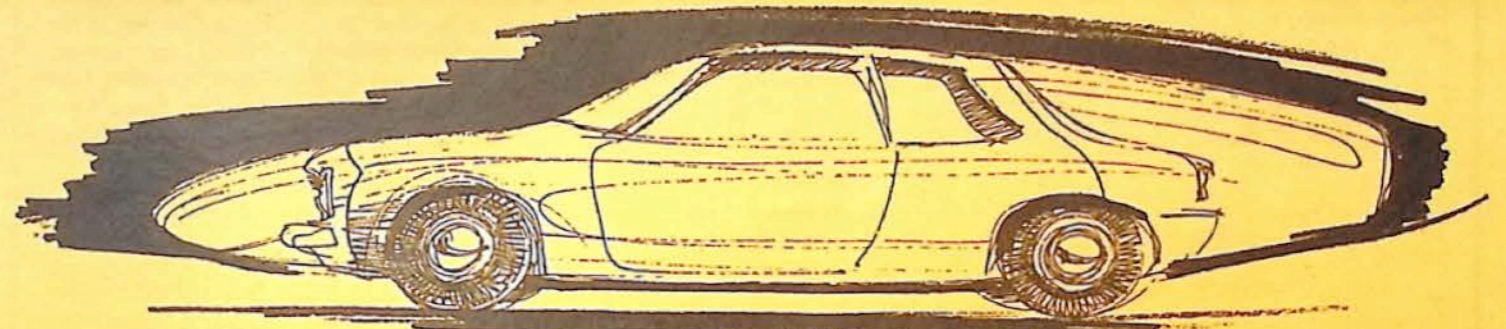
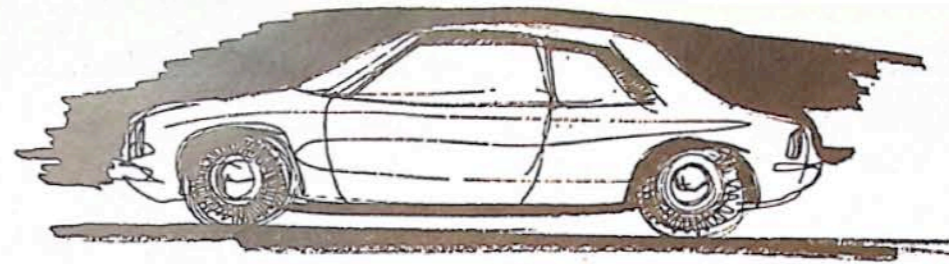
Options & Accessories A Look Ahead

for accessories, you could afford to have a refrigerator in the car for cold drinks on long drives, and a built-in vacuum cleaner would be practical.

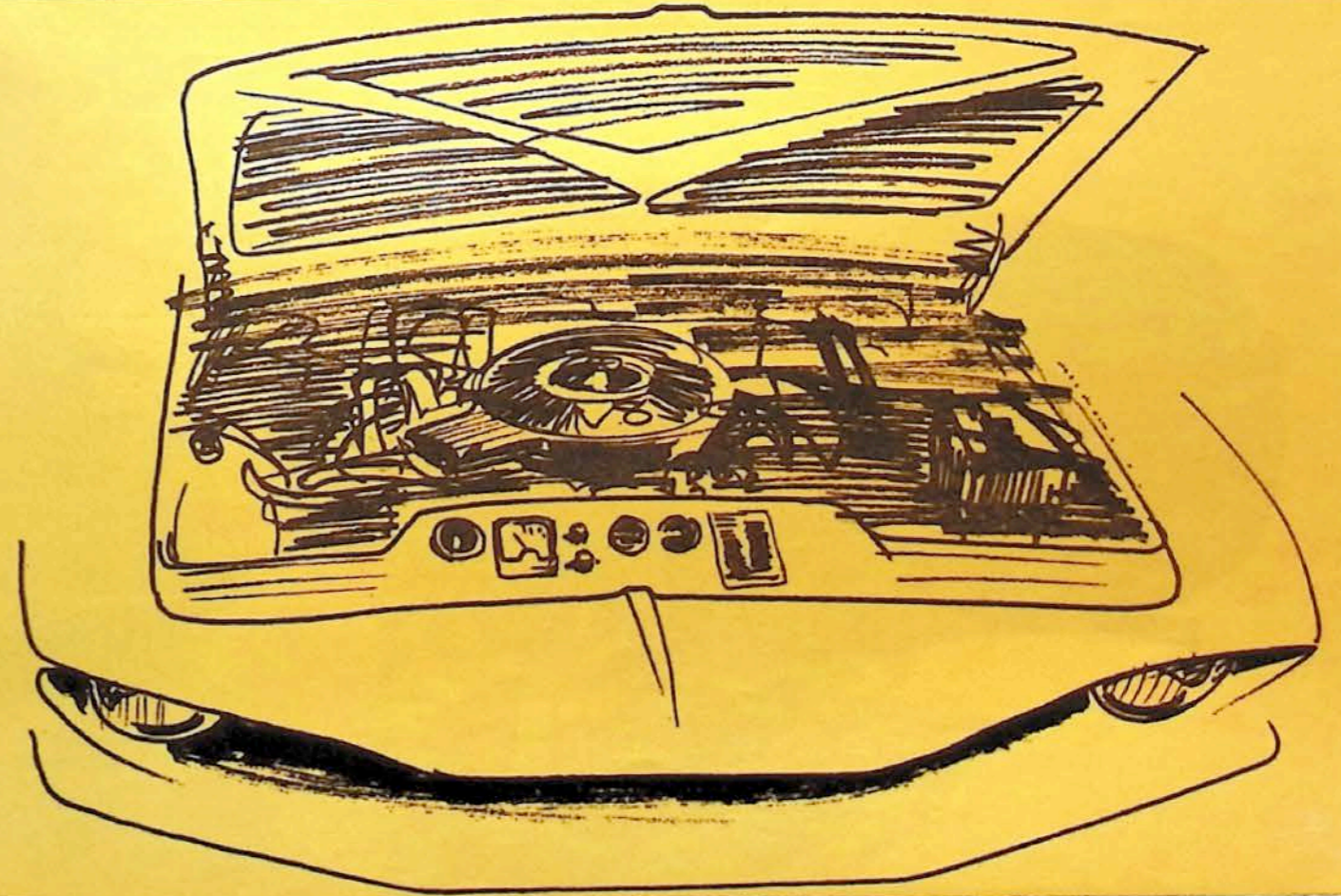
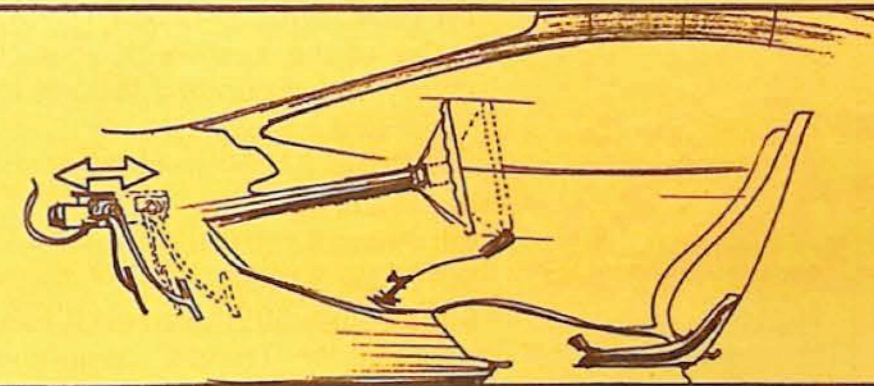
Will these be offered? Why not? If anything is clear from past experience, it is that we are always going to want more complexity. /MT



(Above) Leaving out the package shelf in sedans would permit reclining and adjustable rear seats. All seats in this sedan are inflatable to change both the contour and hardness for maximum comfort. (Left) The age of electronics will have matured to the point where dash will be full of gadgets complete with a factory-installed phone.



(Above) You will be able to "pump up your car" with inflatable, clear plastic bags to give it an aerodynamic form—and increased crash safety—when a small town car hits the turnpikes. There's one thing left to memory: be sure to deflate before parking. (Right) Men and women should still be different enough to warrant movable pedals, adjustable steering columns and highly adjustable seats and backs. (Below) Tune-up instruments and tuning info on an instruction panel will all be built in under the hood. Ideal for the owner-maintainer.



If you've read this issue, and the rules opposite,
turn to page 47 and maybe you can . . .

Win this Pontiac GTO! \$2000 in Cash Prizes! 500 Other Awards!

1st Prize: 1968 Pontiac GTO—Motor Trend's Car of the Year—with your choice of factory options up to \$4500 in total value for car and options.

2nd Prize: \$1000 in cash.

3rd Prize: \$500.

4th Prize: \$350.

5th Prize: \$150.

6th through 505th Prizes: A hard-cover copy of Motor Trend's comprehensive 1968 World Automotive Yearbook.

OFFICIAL CONTEST RULES

HOW TO ENTER: Fill in the Official Contest Entry Form on page 47 of this issue, following the accompanying instructions. Only one entry form (or only one same-size reasonable facsimile thereof) from each individual can be considered for judging. No purchase required.

HOW TO MAIL: Entries must be mailed to CONTEST, Motor Trend, 5916 Hollywood Blvd., Los Angeles, Calif. 90028. To be eligible, all entries must be received no later than June 3, 1968.

WHO CAN ENTER: The contest is limited to residents of the United States, its possessions and Canada. If the winner of the Pontiac GTO 1st Prize is under 18 years of age, the car will be titled in the name of his parents or legal guardian. Employees and their families of Petersen Publishing Co., or any of its suppliers or agents, are not eligible.

PRIZES: 1st Prize is a 1968 Pontiac GTO hardtop coupe, plus choice of factory options, for a total value of \$4500 for car and options (manufacturer's suggested retail price, including federal excise tax and transportation). No rebate of any kind will be made if the winner's choice totals less than \$4500. If the winner of 1st Prize is a resident of Canada, he will be limited in choice to a comparable Pontiac model available for purchase in Canada, valuation being determined by the Canadian dollar. State and local

taxes, licensing fees and make-ready charge of the dealer handling delivery shall be the responsibility of the winner as shall be any federal, state or local income taxes imposed on any prizes.

2nd Prize — \$1000 in cash.

3rd Prize — \$500.

4th Prize — \$350.

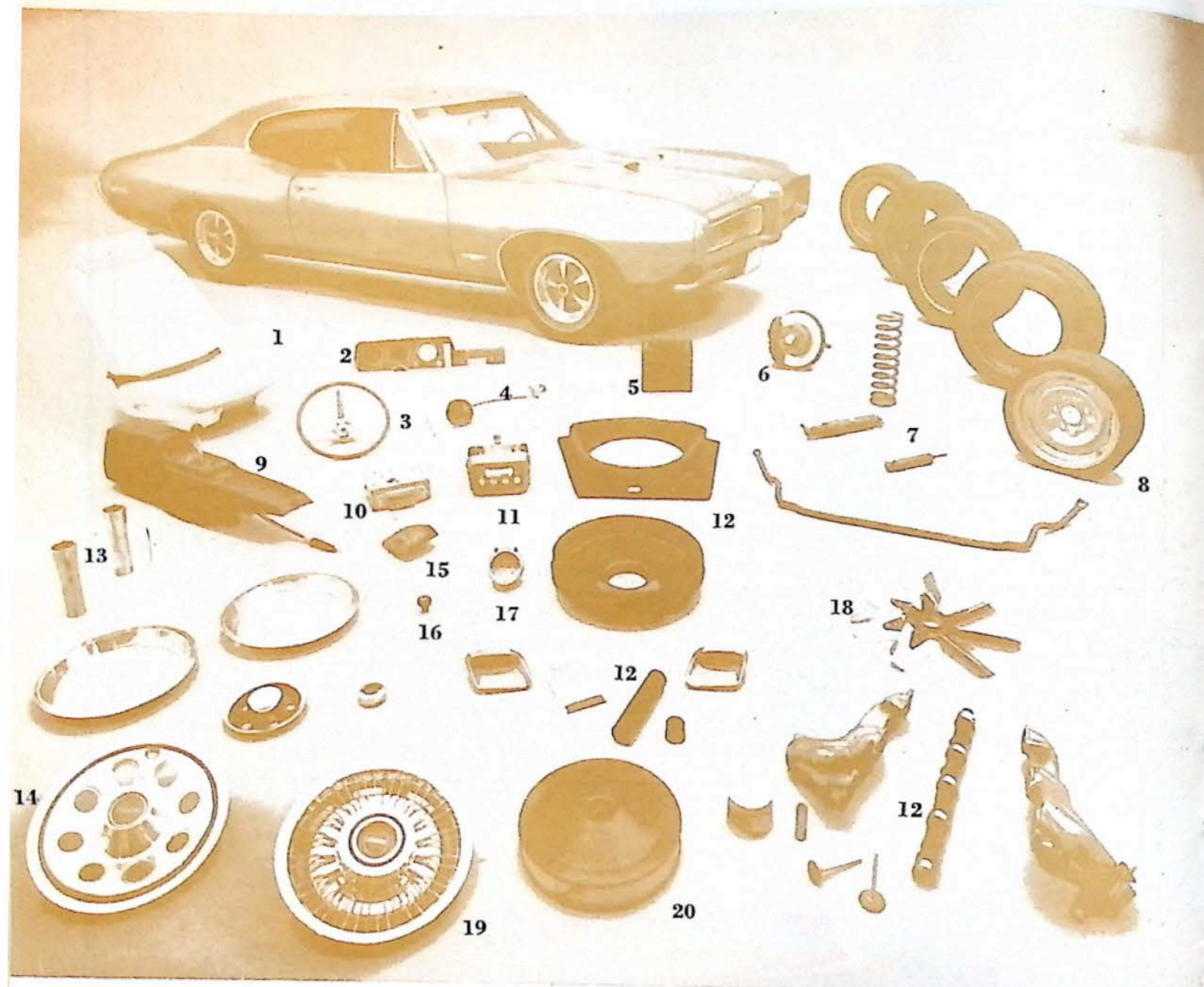
5th Prize — \$150.

6th through 505th Prizes — Hard-bound copies of the MOTOR TREND 1968 World Automotive Yearbook.

JUDGING: Winners will be chosen by a random drawing from among correct entries within 30 days after contest closing date (June 3, 1968). First name drawn wins the Pontiac GTO, next four win the cash prizes in order, followed by winners of the book prizes. Judging will be done by the independent Certified Public Accountant firm of Robert McDavid & Co. Decisions of the judging organization are final. Prize offer is subject to all federal, state and local regulations, and is void where prohibited by law.

NOTIFYING WINNERS: All winners will be notified by mail within 60 days after drawing. No correspondence will be entered into regarding entries. List of the five major winners will be published in the October issue of MOTOR TREND. All entries become the property of MOTOR TREND for any and all purposes.





Pontiac GTO — 1st Prize — with some of the options you may select if you win it . . .

- | | |
|---|--|
| 1 — Reclining bucket seat with head restraint | 12 — Ram Air package (air box, functional scoops, cam, manifolds, valves, pistons) |
| 2 — Rallye gauge cluster and clock | 13 — Exhaust tailpipe extensions |
| 3 — Custom steering wheel | 14 — Custom wheel discs |
| 4 — Outside remote-control mirror | 15 — Hood-mounted tachometer |
| 5 — Heavy-duty battery | 16 — Custom gearshift knob |
| 6 — Front disc brakes | 17 — Rallye clock separate |
| 7 — Heavy-duty coil springs and shocks | 18 — Seven-blade fan |
| 8 — Space-Saver spare tire | 19 — Wire wheel discs |
| 9 — Console with Hurst dual gate | 20 — Heavy-duty air cleaner |
| 10 — AM-FM radio | |
| 11 — Stereo tape player | |

(NOTE: Some of the options pictured are not numbered nor included in the above list. Only the options specifically listed here are involved in the contest — see last question on entry blank opposite. The manufacturer's suggested retail prices on the options listed are available at Pontiac dealerships.)

OFFICIAL CONTEST ENTRY BLANK

After reading the Options and Accessories section in this issue, answer each of the questions below by putting an "X" in the blank square in front of the correct answer — as in the marked sample. Clues to correct answers can be found in the preceding pages. Only one answer square is to be marked for each question, and all questions must be answered correctly to make the entry eligible for the prize drawings. Please use ink and mark the chosen squares neatly.

In addition to 8-track, car stereo units are available in:

- 2-track
- 4-track
- Narrow gauge

Headlamps in the GTO color photo (on page 32) are:

- Cyclops
- Clairvoyant
- Concealed

The original \$84 worth of power steering on a '66 Mustang is today worth about:

- \$40.00
- \$75.00
- \$165.00

Before you buy a heavily optioned car you should:

- Try one
- Work out a plan
- Get a job

Compared to 19% for compacts, luxury car option markups are about:

- 12%
- 25%
- 74%

Greatest advances in future options and accessories will come in:

- Electronics
- Bolt-ons
- Put-ons

Add-on record players are usually:

- 33 1/3 rpm
- 45 rpm
- 78 rpm

To convert 12-volt battery current to 110-volt AC, use:

- Converter
- Inverter
- Reverter

With all those power extras we may soon need:

- A larger car
- An engineering degree
- A second engine

Tinted windows or windshield can now be:

- Sprayed on
- Pasted on
- Bolted on

Head restraints won't be standard on domestic cars until:

- 1969
- 1970
- 1971

New protective chrome body trim strips can be applied with:

- Nuts and bolts
- Wooden pegs
- Adhesive

Performance improvements usually begin with:

- Cams and kits
- Webers and Fields
- Manifolds and carbs

Greatest increase in factory-ordered options since 1961 has been in:

- Air conditioning
- Automatic transmissions
- Power steering

On the opposite page (and on pages 32-33) are a selection of 1968 Pontiac GTO factory options shown detached and displayed around the car. The total value of the manufacturer's suggested retail prices for just those options listed by number on the facing page, falls within the range indicated below (check only one of the squares):

- \$1103.64 — \$1162.37
- \$1162.38 — \$1219.46
- \$1219.47 — \$1278.53

A new safety device sounds the horn when you:

- Exceed the speed limit
- Shift into reverse
- Fall asleep

Sound equipment pictured with GTO (page 32 and opposite) includes an AM-FM radio and:

- A hood-mounted antenna
- A stereo tape player
- Sonar

After marking an "X" in one of the answer-choice boxes for each question, fill in the information requested at the right and mail this entire page to:

CONTEST
MOTOR TREND
5916 Hollywood Blvd.
Los Angeles, Calif. 90028

Be sure to address your entry to:

CONTEST, MOTOR TREND, 5916 Hollywood Blvd., Los Angeles, Calif. 90028

NAME _____ AGE _____
(TYPE OR PRINT IN INK)

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I am a subscriber.

I bought this copy at a newsstand.

1948 Revisited

by Julian G. Schmidt

For the moment I was safe, tucked fetal-like inside the warm belly of the Camaro AMT. All the little old lady could do was stand hopelessly across the street, brandishing her folded umbrella and shouting vulgar invectives at me in an attempt to out-decibel the hushed movement of thousands of autos flowing between us like some kind of socially imposed neutral zone. Suddenly, panic gripped my heart as she leaped into the near-fatal fray. Darting and hopping from car to car — her faded white tennis shoes flashing in the morning sunlight — she tore through the traffic, emerged directly in front of me, and, with enraged heroism and unbridled fury, began beating and pummeling the Camaro severely about the body and shoulders with her umbrella. "Kill it! Kill it!" she screamed.

Rational negotiations were useless. She was beyond that. So I tapped the pedal, the beast emitted one last defiant roar, then disappeared into the jungle, quickly outdistancing our pursuing victor. Five minutes later, two middle-aged publicity agents in an Olds Toronado jeered and pointed as they passed, "Whoeeee! Looka the Mickey Mouse! Haww-w-w!" And when the teenager in the following car asked, "How many box tops did it take?" I parked the Camaro behind a service station, wrapped my collar around my florid face, and hailed a cab. Why can't people understand? It's the Age of Artifice, and if they can't comprehend basic life cycles, then they should climb back to their weirdo ateliers and create in their own non-faddy, lofty, artistic bag.

But for now, the market is youth, performance, hero driver. And the fact that our new "bolt-on" phase enables us to achieve that image in appearance only, without actually fulfilling it, is irrelevant. So what if it is only a cosmetic? At least now everyone can play that most popular New Generation game of all: "Being Different"... just like everyone else. For instance, the AMT is different. A product of AMT Corporation, it is now available in kit form or ready-made from several local Chevrolet dealers. There are non-functional hood scoops, non-functional side scoops, non-functional exposed rocker exhaust, fender flares, rear deck spoiler, race-type gas cap, twin racing mirrors, hood pins and mag wheels. If you like to sleep nights, you can make the exhaust functional

Anyone wanna lay any bets on what the 1988 customizing scene will look like?

and add a traction bar and roll bar for an additional \$335.75, bringing the total cost of your new facade to a meager \$791.75.

Many of the dealers and most manufacturers are involved, so it must be pretty swell. The 100 members of the Los Angeles Region Chrysler-Plymouth Dealers Association commissioned George Barris to hoke up a "performance" styling kit for the 1968 Barracuda. He did, and for \$523.70 plus tax, you can get a set of non-functional hood scoops, non-functional top quarter scoops, non-functional "dual rocker side exhausts," spoiler rear deck lid and custom wheels.

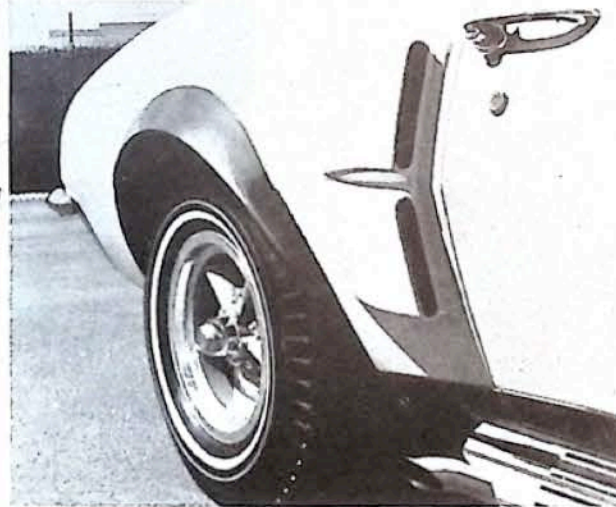
And, once again, through the grace of Barris and \$2390, the classically handsome Cadillac Eldorado can be rendered virtually unrecognizable by

the sinister Del Caballero process. Half its top is applied in vinyl, colored and textured belt moldings are added as well as a front fender chrome molding, door glass is canted and shortened, and interior headliner side panels are given a double sewn air foam pad. A smaller rear window, 10 x 40 inches, and a sunroof, are added. Landau irons are fastened to the sides of the top, gold wreaths are added to the hood and deck, and just about everything in sight is rechromed. Different hubcaps are used, directional parking lights are installed on front fenders of '67 models, and interior swivel reading lights are installed into original bezels.

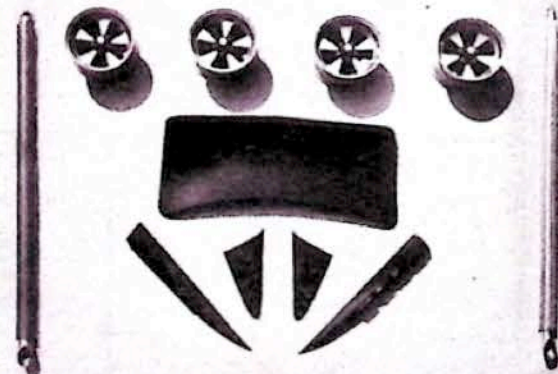
So if eggheads claim this bolt-on phase is dumb or vulgar or an aesthetic flam... well, then they simply must learn to accept some of man's more

insensate limitations — and understand that there's a certain segment of population out there, regardless of how ludicrous, with a need to possess something bestial, regardless of how phony. They've got to understand The Cycle, wherein if we don't possess enough inherent quality to achieve it through honesty, good taste, intelligence or creativity, then we revert to The Cycle. Some people keep improving on past attempts, so for them The Cycle isn't necessary. But there are more who don't.

So here we go again. Suppose we had taken the Barracuda "Spoiler" to Barris 20 years ago and asked him how to customize it, he would have said, "Well, we'll lop off those hood scoops, trim off those side scoops, remove that outside rocker exhaust system, smooth off the deck lid..."



Camaro AMT is the most immodest rendition of all the "Put Ons." You "put on" a spoiler deck lid, "dual-intake" side scoops, gigantic hood scoops that actually cut your forward visibility, and rocker exhausts that can be made functional for more money. Fender flares and double-stripe paint job — extras — add much to The Look.



(Above) Barracuda Spoiler kit, shown complete and installed in top figure, consists of a set of mag wheels, dual rocker exhausts, a "spoiler" deck lid, top rear quarter panel "air scoops," and hood scoops, all simulated. Eldorado Del Caballero is at left.



by Julian G. Schmidt

Within easy reach of the toilet stool in Andy Granatelli's very personal bathroom in his very private office, is a telephone with six extensions. Andy Granatelli never takes a vacation—a philosophy to which he adheres with such martyrdom that even Man's last, most intimate retreat from daily strife is not allowed to quell his ferocious energy, nor dull his dynamic pace.

I had waited for 12 hours to see The Chief (an epithet conceived in all respect by his associates). You could say it was a normal day. At 8:15 p.m. his office was finally cleared of the last appointment other than myself, and the door to his awesome aerie was opened... the whole pad, complete with kitchen, bedroom and bathroom

(with shower), could go for 80 grand in Bel Air. Movie deals are closed, the destinies of millions of tiny cans of STP are determined, and the fate of America's racing industry is sealed in this office, and there's enough space to do them all at once.

The Man (another epithet conceived in all respect by his associates) arose—with all the regnancy of a business dynamo who has made the sales of Studebaker Worthington Inc.'s STP Corporation skyrocket since his presidency—and the office became abruptly smaller. For at least 14—more likely, 17—hours, he had been behind that desk, and when he emerged, it was not unlike an eagle just out of its egg. He straightened his limbs and arched his back, removing kinks from all extremities. Obviously, it had been a day of stress—as have all days since June

26, 1967, when USAC first slapped his wrist for the embarrassing challenge he presented them—and his face was pallid, bags of weary, well-used flesh were suspended from his red-laced eyes, and his black hair was slightly matted with perspiration.

Andy's Anodyne is Dolly, his young and beautiful Lebanese wife who has, from somewhere, inherited royal composure. She knew exactly what to do. Immediately, she kissed him lightly on the cheek and began keeping house in the gigantic office. It's the kind of intuition that comes only from 11 happy years of marriage, and it was the only technique that brought an indication of The Chief's first pause of the day.

Andy Granatelli—of all people—was apologetic. I had waited, at my own insistence, and he was apologetic. Be-

sides, he looked awful and knew it, yet on him his disarray looked good, symbolizing the struggle of one man's rights against The Establishment.

Dolly, using a perspicuous sense of insight, somehow gave him a brief moment of levity, and he welcomed me. "Well, what do you want to know, other than that I'm fat?"

I asked him if he had any problems. It blew his only opportunity to relax. Problems, since the notorious June 26, 1967, comprise a painful subject and one close to his heart, and once he gets started, it's not the voice of the racer-promoter-money-maker who championed the growth of Midwest racing, but rather, a cry of disappointment that his sincere, successful efforts were resented. When discussing the apparent capriciousness of USAC's decisions, Andy claims, "It makes me

so mad I can't talk about it," whereupon he launches his tirade with the fervor of a demonized man.

The phone rang, he talked for two minutes and hung up.

Granatelli's frustration is understandable, and, in fact, infuriating to his thousands of sympathizers, among whom he has garnered even show business people such as Joey Bishop—a close friend—and Johnny Carson. On October 1, 1964, USAC informed members that, commencing January, 1967, and enduring through January, 1971, turbines would be unlimited. Yet, on September 12, 1966, they suddenly decided to limit them to a 23-sq.-in. annulus area.

Many of his critics claim it was more than coincidence that Granatelli's famed No. 40 "just happened" to conform—almost exactly—and what's

more, that he was downright colluding with certain USAC officials for this convenient coincidence. But Granatelli claims there's more to the story. The final annulus area decision of 23 square inches was based on a hypothetical, or rather, arbitrary, horsepower estimate of 600 on a cold day, in order to not exceed the horsepower ratings of piston cars. The original 29-sq.-in. proposal was rejected with the rationale that on a cold day the horsepower rating would be more than competitive with piston engines. What few people realize is that the horsepower rating was actually much lower than piston-powered competitors' and that the 23-sq.-in. restriction prevented him from using (a) a larger, more powerful Pratt-Whitney engine, or (b) a T-72 Continental.

Another phone rang, then another, and at exactly 8:45 p.m. Andy Granatelli was sitting behind his office desk with a receiver to each ear. Honest. And entertaining his wife and two others facing him in person at the same time.

The Man has a policy of ignoring no one. He's gracious to the point of sacrifice, and his delicate sensitivity is obviously his nemesis. At a time when most men would view restrictions and rejections as strictly machinations of a computerized corporate society, Andy Granatelli finds them painfully personal. For instance, he likes to forget about the controversy concerning Ken Wallis, chief engineer for the No. 40 project. Wallis, who apparently forgot that he was placed in charge of the project after its inception and who immediately lost sight of the complexities of Granatelli's basic responsibility, was perturbed at his chimerical lack of recognition, even though a publicity release dated May, 1967, gave him the

continued on page 78

Motor Trend presents its **Loser of the Year**

At Indy last year, Andy Granatelli tragically lost the race. In his fight against naivete, he has sadly lost friends. For his love affair with an automobile, he has painfully lost days of sleep. Therefore, Andy Granatelli is a winner.

Granatelli Asks Cour'

DEVELOPER BALKS T TURBINE LIMIT

Six Car



Spurred by the energy and creativity of the controversial Andy Granatelli, America has moved at last into the turbine age of racing. Europe preceded her, with the technical elegance and success of the two Rover turbine cars at Le Mans, and with a very workable and meaningful turbine car performance formula. Has America learned from this, to build an even better basis for turbocar competition in its major events? Unfortunately not. In fact, the total ineptitude, both political and technical, of the U.S. Auto Club has made the inevitable transition as painful and embarrassing as possible.

Running unerringly true to form, USAC moved precipitously right after Indianapolis in 1967 to impose crippling limitations on the use of turbine engines in its Championship racing category. It did so on the basis of the STP-Paxton Turbocar, an exceptional machine which enjoyed a small but significant margin over its competition in the 1967 "500"; and in order to penalize this car and its owner, USAC threw out all its earlier commitments and acted on the flimsiest and least accurate technical grounds.

Can it really be possible that this organization, which sanctioned 134 events in 1967 with total prizes of \$2,273,516 knows very little about the history, technology and responsibility of the sport it is supposed to govern? Its president, Tom Binford, recently de-

The rules said that any entries would be weighed and measured as an aid to determining future limits which would be applied after the 1955 event—not earlier. Thus a car built for the 1954 race would have been guaranteed two tries in the "500." In the following years, all the way through the 1966 race, the rules read simply: "turbine engines . . . of unlimited size."

Binford: "If the formula proves to be considerably too small . . . the Board has agreed to change it again in 1969."

Facts: That's just the trouble, as Andy Granatelli says. They probably will change it again, just as capriciously and selfishly as they did for 1968. That's why Granatelli has filed suit to be allowed to race, in 1968, cars which conform precisely to the 1967 regulations—as did his STP-Paxton Turbocar.

How did Andy Granatelli, one-time hot-rod and speed equipment manufacturer and now president of Studebaker's STP Division (actually a separate corporation since January 9), become a champion of the turbine engine? Andy and his brothers, Vince and Joe, had always wanted to win at Indianapolis and toward this end they acquired the Novi engines and cars in 1961. At that time no turbine car had ever tried to qualify at Indianapolis, though tire testing laps had been turned in 1955 by an old Kurtis 3000 chassis in which a Boeing 502 turbine

the car could be made to go faster.

What are the main problems? They are torque and response, and they're related. Turbines are noted for their high torque at low output speeds, highest at Indy just as the car comes off the corners. If the high torque cannot be harnessed to the job of acceleration right at that point, without wheelspin or loss of control, most of the turbine's performance advantage will be thrown away. With 2-wheel drive and the narrow tires of the early Sixties, wheelspin could not be avoided. Compounding this was the typical turbine response lag of a second or more from the desire for more power to the availability of that power. And once you put your foot down to ask for full power, "Brother, you're committed", as Granatelli says. Simply backing off on the throttle doesn't reduce power instantly, as it does on a piston engine. So wheelspin, once started, was almost impossible to stop with earlier turbine cars.

The solution, indispensable to and inseparable from the success of the STP-Paxton car, was 4-wheel drive, combined with the latest in Firestone wide-tread tires. Only with all four wheels driven could a car actually use that turbine torque that looked so tempting on paper.

Granatelli had become involved with 4-wheel drive as a means of using the 700+ hp of the fabulous supercharged

the car ready for May—a beautiful, immaculately prepared automobile.

The Ferguson-Nowi had terrible luck at Indy. In 1964 the car was knocked out in a 2nd-lap accident. In 1965 a new, lighter model was wrecked in a practice crash, hitting a spinning car, and the older one retired with a broken oil line on lap 69. In 1966 a single light car with a rear-mounted radiator was wrecked in practice by a rookie driver.

There was only one 4-wheel-drive Novi at Indy in 1966 because Granatelli and his men were already well under way on their Ferguson-drive turbine car. The system they used was essentially that of the P104, with shafts along the left-hand side of the chassis. A new housing contained the same Monolok center differential used in 1964, set to allow the front wheels to overspeed the rear ones by only 5%. In principle the front and rear differentials were Ferguson, without limited-slip, though Granatelli changed from straight bevel gears to hypoid gearing to get a lower driveline. Bendix constant-velocity universal joints took the drive to the wheels.

Geared to this drive system Granatelli had an excellent gas turbine engine, not the most powerful one available. ("I learned from the Novis that horsepower alone doesn't win this race.") It was the ST-6 industrial version of the PT-6 turbine built by United Aircraft of Canada Ltd.—owned

peak of 890 lbs.-ft. with the driveshaft stalled at zero speed. The lowest torque is at the peak shaft speed: 495 lbs.-ft. At Indy it was widely whispered that the turbine has an "adjustment screw" which with a twist will increase output to 900 or more hp. United Aircraft engineer Fred R. Cowley, who'd been assigned to the project, confirmed that there was such a screw—but it was only for trimming the output of production engines and had a range of no more than 20 hp.

With aircraft engines, the most important part of the physical shape is the frontal area, the diameter. It has to be as small as possible; length is relatively unimportant. Thus the ST6B-62 was far too long to sit in line with the driver, yet slim enough to be placed alongside him, on the left-hand side of the car. The location on the left is related more to the driveline placement than to the 60% left-hand weight bias, since the engine weighs only 260 pounds.

That's how the car was conceived: turbine engine, side-by-side mounting, and 4-wheel drive. That's how each part of it is inseparable from the others, merged in a genuinely integrated machine. Who actually planned this integration, and designed this remarkable car? More than to any other single man the credit goes to British-born Kenneth B. Wallis. With a sound background in aerospace engineering, Wallis began

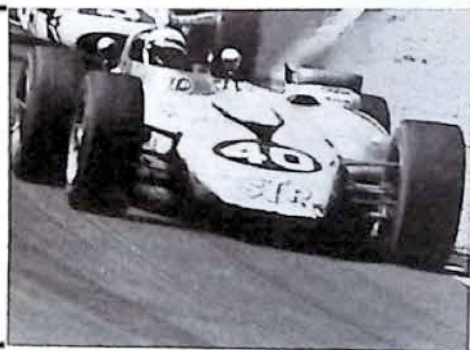
a shorter, lighter frame. Special compact and precise anti-roll bar mountings were developed for both ends of the car. Halibrand cast the magnesium wheels, with rim width at the (then) legal maximum of 9.5 inches.

Against the front face of the frame a rack and pinion steering gear is bolted, providing only one-half turn from lock-to-lock. The lock, of course, is not very generous. "After you've turned the front wheels 11 degrees," says Andy, "it doesn't matter any more." Films taken during practice at Indy showed that Parnelli Jones used no more than about 20 degrees of steering wheel movement on the corners anyway. As first built, the steering gear had a single hydraulic damper mounted within the body. This was replaced by two dampers, each attaching directly to one of the forward-facing steering arms.

Construction of the STP-Paxton Turbocar rushed ahead in early 1966, with a target of that year's Indy 500. Made out of stainless steel, the frame was impressively light at 90 pounds. It had to be heat-treated as a complete assembly in a huge oven, however, and when it was completed, they found it had warped beyond repair. Granatelli: "That was a low moment in my life." All hope abandoned of a 1966 race entry, a new frame was riveted of 7178-T6 aluminum alloy. It was heavier, at 137 pounds, but this was not serious

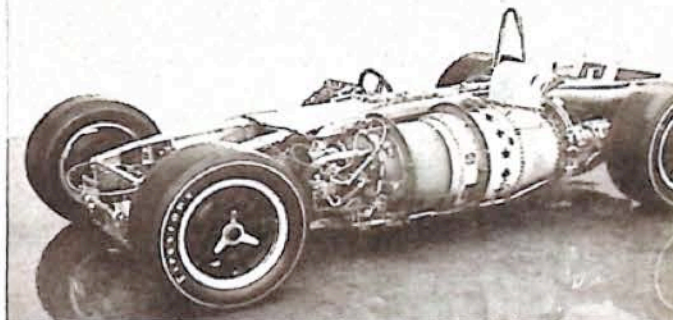
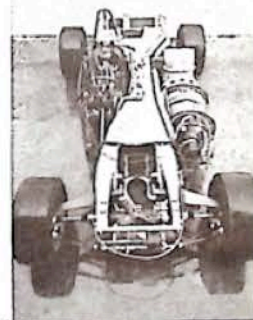
The Incredible Story of the World's Most Advanced Racing Car

The turbine era in international racing is not just around the corner; it's here. It was brought in a cloud of controversy by a superbly-engineered racing car, the STP-Paxton Turbocar, whose future is now being fought out in the courts.



by Karl Ludvigsen

An amazingly light frame made of stainless steel weighed only 90 pounds. The car was revolutionary in nearly every way: weight, powerplant and driver position, which is a sure way to incur the wrath of USAC. Another sure way is to render nearly any piston engine obsolete.



fended USAC's new turbine limits in a letter to a critic:

Binford: ". . . the 500-Mile Race is the only place in the world where conditions are such as to attract a competitive turbine in the first place."

Facts: At Le Mans in 1963 a Rover turbine car collected the long-standing prize of \$5000 for the first such car to run the race at better than 93 mph, and an improved version finished the race with distinction again in 1965. In 1968 a Howmet TX turbine sports car will compete for top honors in the world's long-distance races.

Binford: ". . . many people do not realize the 500-Mile Race has never been an unrestricted race."

Facts: For the 1954 Indy race, in the first great wave of enthusiasm for turbines, such engines were allowed, for the first time, on an unlimited basis.

had been installed.

In 1956 Len Williams, an enthusiastic Boeing engineer, presented an SAE paper which showed how one of his turbines would outperform the Offenhauser engines of the day, coming off the corners at Indianapolis. Top Indy car owner Jack Zink took note of this and planned, for the 1961 race, a rear-engined Boeing-powered car with the help of Williams. Not until 1962 did the Zink "Trackburner" appear at Indy, developing a peak of 430 bhp when the weather was cool. It wasn't when they tried to get up to qualifying speed and the car could lap at only 145 mph versus the 146 mph needed to get in the race.

Andy Granatelli, who was struggling in vain that year to get even one Novi into the field, was impressed by the turbine's total reliability, and he knew

Novi V-8. Stirling Moss first suggested the idea to Andy on a visit to the U.S. in late 1961, just after he'd won a race at Oulton Park in the British Ferguson P99 4-wheel-drive car. Tony Rolt of Ferguson was advised of this contact but nothing came of it until June, 1963, when Andy asked Ferguson to bring a car over for tests at Indy. The very tired P99 was flown over and buzzed around the track by Jack Fairman and Bobby Marshman at an almost constant speed of 142 mph on August 8-9.

After an official go-ahead from Granatelli on December 6, construction of the Ferguson P104 proceeded rapidly. In March the car was air-freighted to Indy for engine installation and it turned its first laps of the track, Andy at the wheel, on March 28. A garage fire at the track set the program back but the Granatellis persevered and had

84% by United Aircraft Corp. Early in the Sixties United Aircraft—today a \$2 billion company—decided it would take an interest in all aspects of transportation. Its PT-6 turbine, designed in 1959 and produced since 1963, now at a 100-per-month rate, has been used in all kinds of aircraft, including the business plane owned by Mr. Shirley Murphy, sponsor of A. J. Foyt's 1967 Indianapolis-winning car. Two of the engines were used in "Thunderbird," an ocean-racing boat that caused almost as much controversy in its field in 1966 as the Turbocar did in 1967.

The ST6B-62 turbine as supplied to Granatelli develops 550 bhp at 6230 rpm at 59°F. at sea level. At 80° F. the power drops to 515 bhp, and to 450 bhp at 100°F. (The temperatures on the two days of the race were 59° and 68° F.) Output torque reaches a

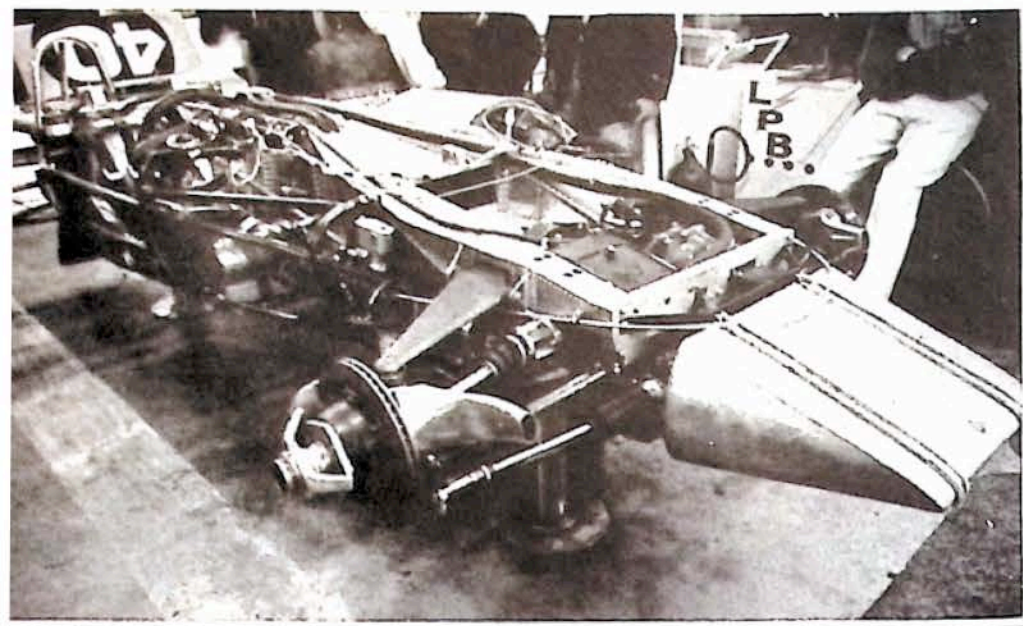
to work with the Granatellis as an outside consultant, when the turbine car project was begun in mid-1964. In November, 1965, when fabrication started in earnest, Wallis became a full-time chief engineer for the Paxton Products plant of Studebaker's STP Division. Andy's brothers, Joe and Vince, were responsible for actual construction of the car.

In broad principle the suspension design of the Turbocar followed closely the proven layout of the P104 Ferguson-Nowi. Like the latter, coil-shock springing units were placed inboard at all four corners to reduce aerodynamic drag. The rear suspension was almost identical to the Ferguson design, with some added adjustability for chassis tuning. At the front the coil-shock units were moved behind the front-drive differential, to permit

in view of the minimum weight at Indy of 1350 pounds. The final car weight was only 1410 pounds dry.

Ken Wallis laid out the frame bulkheads to contain five Firestone fuel cells with a capacity of 44 gallons. One-way valves caused the front and rear pairs of cells to feed the center one, with the remarkable result that both lateral and longitudinal weight distribution remained unchanged as fuel was consumed. Gravity from the center cell fed the kerosene fuel to a gallon tank at the right rear, within which was an electric fuel pump to supply the engine. When tests at the track showed that fuel consumption was higher than expected, 3.66 rather than 3.85 mpg, an additional 9-gallon cell was installed in a container cantilevered from the front of the frame, inside the nose.

continued



World's Most Advanced Racing Car *continued*

With side-by-side construction, the car had to be wide. Its projected frontal area was as high as any car at Indianapolis. After thorough wind tunnel testing of models, however, a body shape was developed which had very low drag, more than compensating for the extra frontal area. Careful internal air flow planning also contributed to the low drag. Aircraft-type flush inlets on the top of the body admitted air to the engine and differential oil coolers, at the rear of the frame, and to the turbine inlet, farther forward. Air for the turbine was ducted through the frame from the 51-square-inch inlet, redirected by turning vanes, and filtered through a fine mesh screen to hold back the unidentified flying objects that can destroy engines at Indy.

Though the STP-Paxton car didn't make it, there was a turbine-powered car at Indy in 1966 — one which unwittingly set off the whole current furor over turbine limits. It was the Jack Adams Aircraft Special, with a General Electric T-58 engine in the front of a 1961 Watson "roadster" chassis. The 1350-hp car had tire-smoking acceleration, straightaway speed over 200 mph, and very poor handling and brakes. It never came close to qualifying, but it left a lasting impression on the USAC Rules Committee. In September, 1966, they recommended that turbines be banned altogether, on the grounds of the supposed danger of explosion. But they were told by the USAC Board to go out and get a formula that would limit turbines to about 600 hp.

Headed by ex-driver Henry Banks, the Rules Committee developed a formula which was ratified by the USAC Board on January 12, 1967. It specified a maximum area for the ac-

tual air inlet of the turbine compressor of 23 square inches for axial-flow compressors, and 28.5 square inches for the less efficient centrifugal-flow compressors. This change, in a formerly unlimited formula, was made effective immediately, literally without notice. By sheer luck the suggested axial-flow limit of 23 square inches was just barely in excess of the inlet of the ST6B-62 engine.

In framing the formula USAC officials may have kept the STP car in mind, because they'd been told about the car and invited by Andy to see it in late 1966. The first racing outsider to see the chassis was ace mechanic George Bignotti, on March 15, 1967. His reaction, after 10 minutes of silence: "I think I'll go back into the florist business."

When he was asked to try the car at Phoenix, with the prospect of an Indy ride, the semi-retired Parnelli Jones thought to himself, "They've got rocks in their head. How can they ever get good throttle response? And Andy says they only have 550 horses. What a sad waste of a lot of time and money. But I'll give it a fair trial and then we'll see." Parnelli ran at Phoenix just 1/3 second away from the track record. "I was testing my own car there and I didn't want to get back in it. It was like getting back into a prop job after you've been riding in a jet plane. Driving the turbine I could hear the universal joints, the pucks clamping the brake discs, and every little squeal from the tires. And with kerosene fuel it has to be safer than the other cars."

Late in March Parnelli and Jim Clark tried the car at Indianapolis. Computer readouts had told them to expect speeds of 200 mph on the straights and a potential lap speed of 173.5

Laymen were agog at the side-by-side driver position, sometimes even more than the fact that the car was powered by an aircraft engine. Yet that was the logical solution, since the turbine occupied nearly the entire length of the car. Four-wheel drive was patterned after the old P104 Ferguson-Novis. Coil-shock suspension units were placed inboard to further aid in weight elimination.

mph, but with the gearing the computer told them to use they couldn't average better than 152. After a change in the gears between turbine and center differential they lapped at 162, in March, with a peak of 191 on the straights.

Parnelli was not entirely happy with the braking in these tests, so they doubled up on the pucks in the 12-inch Airheart brakes, using Raybestos sintered copper linings. At the rear Wallis also engineered a hydraulically-raised braking flap, which was automatically erected when brake line pressure rose above a certain limit. Parnelli handled the brakes so smoothly during the race that the flap came up only when he slowed for pit stops and when he had his heart-stopping spin. Even then he praised the Turbocar: "I never felt I lost control of it. I never spun in my life in any other car and felt that way." Parnelli also liked the car better when it was full of fuel, perhaps because the ride was slightly better that way. A full load made no difference to handling, and most of the May practice laps were turned with full tanks.

Between Phoenix and Indy the chassis required virtually zero adjustment. During May the USAC "experts," obsessed by the spectre of turbine disintegration (though they ride in jet planes many times a year and God knows the piston engines at Indy blow up violently enough with a banzai load of nitro), demanded that Andy install a steel scatter shield around the hot section that would have weighed 300 pounds. Granatelli satisfied them — but with a 3/8-inch titanium shield that cost \$3800 and weighed only 38 pounds. Weight was reduced in compensation by eliminating the elaborate practice instrument panel with its 13 indicators in favor of a simple panel with only two dials.

The story of practice and the near-win of the Turbocar is now well known. But some aspects of that hectic month of May are not common knowledge:

1. The car was unable to get above 163 mph until just three days before the first qualifying weekend. The crew was then by no means confident. Parnelli's starting position was the worst he'd ever had at Indianapolis.

2. Qualifying was a fingers-crossed proposition with a bolted-up set of transfer gears made from the pieces of the several sets, improperly heat-treated, that had failed in practice.

continued on page 84

Is Lombardi lucky?



It's a lucky thing for Lombardi that there are rough, tough clubs like the Colts, the Cowboys and the Bears around the league.

Without them, his Packers wouldn't be the great club they are.

Greatness, after all, is the rarest commodity on the market. It isn't something you're born and raised with. It's something you rise to—against the stiffest kind of competition.

A simple fact of life, you say. True in sports, or school, or business, or industry.

Funny thing, though . . . there are people around today who just don't buy that point of view when it comes to business.

They think there's *too much competition in the marketplace*. Too many brands in the sporting goods store, for instance.

Too many manufacturers fighting each other to sell you something.

They'd like the government to take steps that would eventually lead to fewer brands in the stores, and therefore, less competition.

But, they forget that restricting competition is not the way this country got great.

It is competition that produces the endless innovations in our marketplace . . . that creates whole new industries . . . more jobs . . . that makes the Packers the greatest.

Say . . . can you imagine Lombardi's reaction when somebody tells him the referee is going to call his plays for him?

And he can't average 241 in the line because the Colts average only 233?

Magazine Publishers Association
An association of 365 leading U. S. magazines

Luxury: The great American dream

Can the lowly family sedan attain the stature of the majestic marques?

By Bill Sanders

Her head tilted back on the seat. A tenacious vitality glowed in the opacity of her stare. Electric blue eyes, laser beams of concentration, penetrated the off-white headliner. Outside, the tepid February afternoon hovered in sultry fever over the Southern California beach. Incarnadine salmon sun cauterized tinted windows with merciless pyromania. Inside, the velvet soft coolness of air conditioning insulated the plush, soft world of sensuality. She looked relaxed, yet somehow mechanically tense. The imperturbable, perfectly composed features showed no trace of emotion. The sentient, beautiful face was a mask, hiding a veil of consciousness.

"Relax... enjoy yourself, sweetheart. After all, you don't ride in a Coupe de Ville everyday," I suggested.

Voice, the new sound, startled her. The straight, blonde hair was brushed aside as her hand swept instinctively upward. She moved slightly, an angry frown marred the soft lips.

"What is it with you? Can't you see I'm listening to the stereo? Man, what a drag. Wow!"

"Oh."

... That's right, baby. Stereo. This is the year of stereo. It don't mean a thing if it ain't got that zing. Stereo. FM multiplex or tape deck. Take your choice or take both. Speakers in the front, speakers in the back, speakers in the doors: surround yourself with sound. Electric seats and windows are passe. Stereo makes a luxury car in 1968... or does it?

What constitutes a true luxury car? How much luxury do you get for your dollar? Will the addition of luxury options make a Chevy, Ford or Plymouth a luxury car? Luxury is as luxury does. It can be a state of mind, but ultimately becomes much more than that out of physical necessity. It is not only a material judgement, but is psychological as well. Concerning the latter, "image" is a prime luxury prerequisite. "Image" is half the battle.

Chevrolet tried valiantly with Caprice, but it doesn't come close to the Coupe de Ville, even with vinyl roof and flashy wheel covers. Ford's LTD is relatively close to the Continental



—you know they are from the same maker—but Continental still has its own mystique. With the VIP, Plymouth has produced a car of nondescript, movie-type elegance. It looks like a limousine, but what is it? It comes closest to its big car counterpart in "image," but, rather than elevating the VIP in stature, the close resemblance only impairs the prestige of the Imperial. And the difference in price between the VIP and Imperial LeBaron is substantial: \$3648.35 in our test cars.

Body styling seems to be inseparable from "image." Coupe de Ville still reigns champ with massive, but well contoured lines. Chevrolet has endowed Caprice with style features similar to the Coupe de Ville's, but they don't project the massive quality. Continental styling remains aquiline, but with individuality, while Ford body contours are more fluid and less angular. Both Chrysler subjects seem to be several years behind in styling, with a stark, boxy appearance.

Comfort is dominant in the big cars, but only in degree. Coupe de Ville seats are massive and luxuriously comfortable. Six-way electric adjustment puts the front seat in any desired driving position, but, with a bench-type seat, front passenger must accept the same arrangement, like it or not. Our test Caprice had front bucket seats with center console. These seats were no different from any Chevy's and were manually operated: you only moved forward or backward. Seating comfort in the Coupe de Ville was excellent; in the Caprice it was ordinary. For plush, luxurious seating our test Ford LTD was the paragon of comfort in the intermediate group and came closest to the big cars in this

area. In fact, the LTD seemed every bit as comfortable as the Continental. Continental power seats also have excellent positioning. Plymouth seats, like the Caprice's, were ordinary, but did have power adjustment and fair positioning on the driver's side.

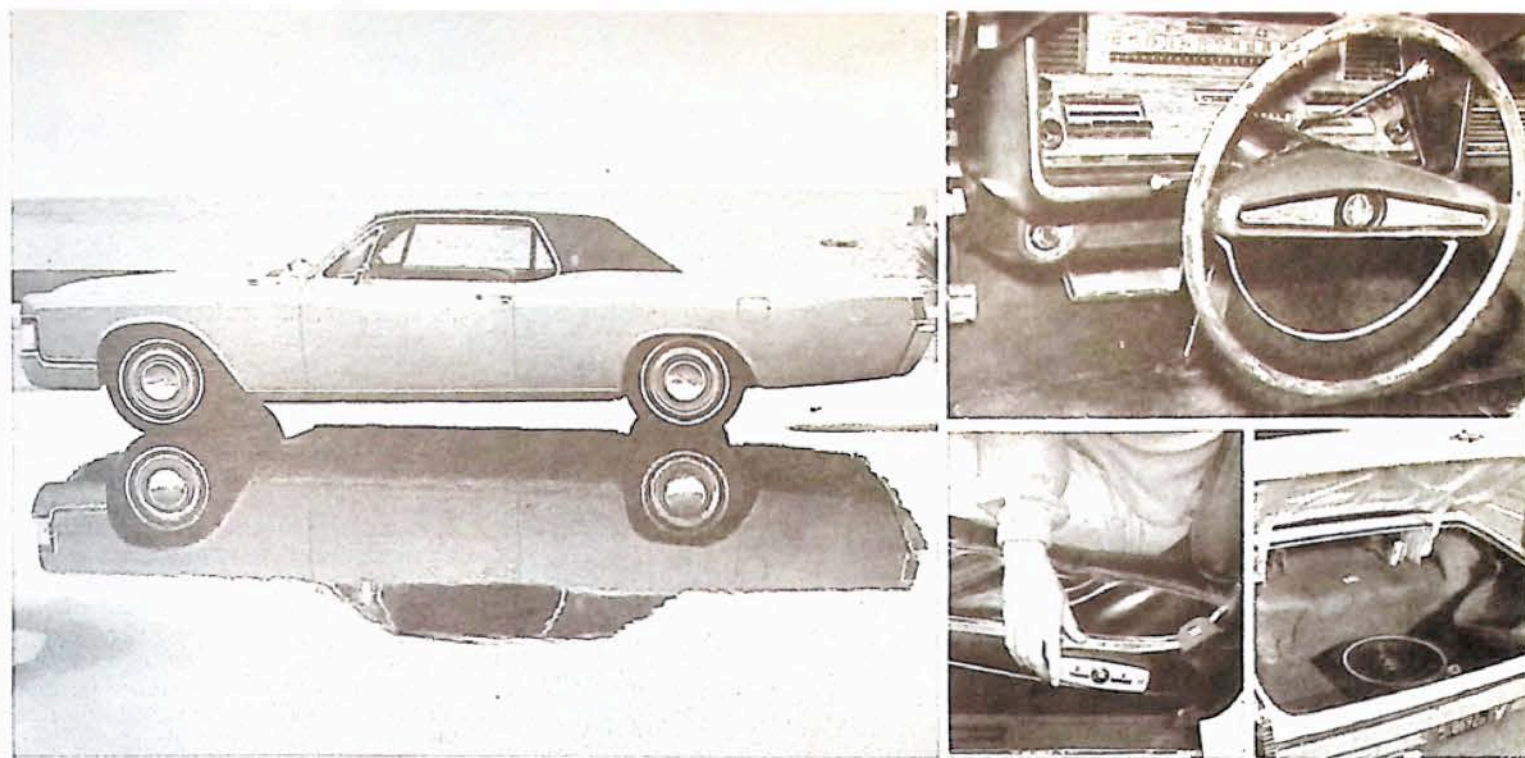
Chrysler Imperial may not turn many heads with its Dowager Queen Mother styling, but the Chrysler men certainly know how to please one's tired old body with fastidious creature comforts. Seating is superior, especially in the rear. Split front seats on our LeBaron 4-door sedan test car had individual electric controls, allowing driver and passenger to adjust his seat to any desired position. Front seats also had individual fold-down armrests, as did the front seats on the VIP. Even the other two big cars don't have this feature. One staffer summed up the LeBaron succinctly: "It's like driving your living room down the highway."

All three big cars had leather seats, a priceless luxury touch. Our Caprice had "leather-like" vinyl that was obviously vinyl and not too leather-like. Both LTD and VIP were upholstered in black nylon, which, when tufted, as in the LTD, gives a more eye appealing, luxury look in the lower priced car at much less cost.

Entering the rear seat compartment on all the coupes was a difficult project, especially in the Coupe de Ville and Continental with their massive front seatbacks. The Caprice, with bucket seats, was the easiest to enter. Both VIP and Imperial were 4-door sedans and rear seat entry and exit was relatively simple, especially in the Imperial, which had plenty of rear seat legroom.

The two groups come closest in convenience. You can add most of the electric and vacuum gadgets, power accessories, and stereo to the intermediate cars and still get a car for \$2000 to \$3000 less. Of course the question, "What constitutes a luxury car?" still remains, but if the options alone turn you on, you're better off buying the loaded intermediate.

Electric window and door lock operation differs immensely from car to



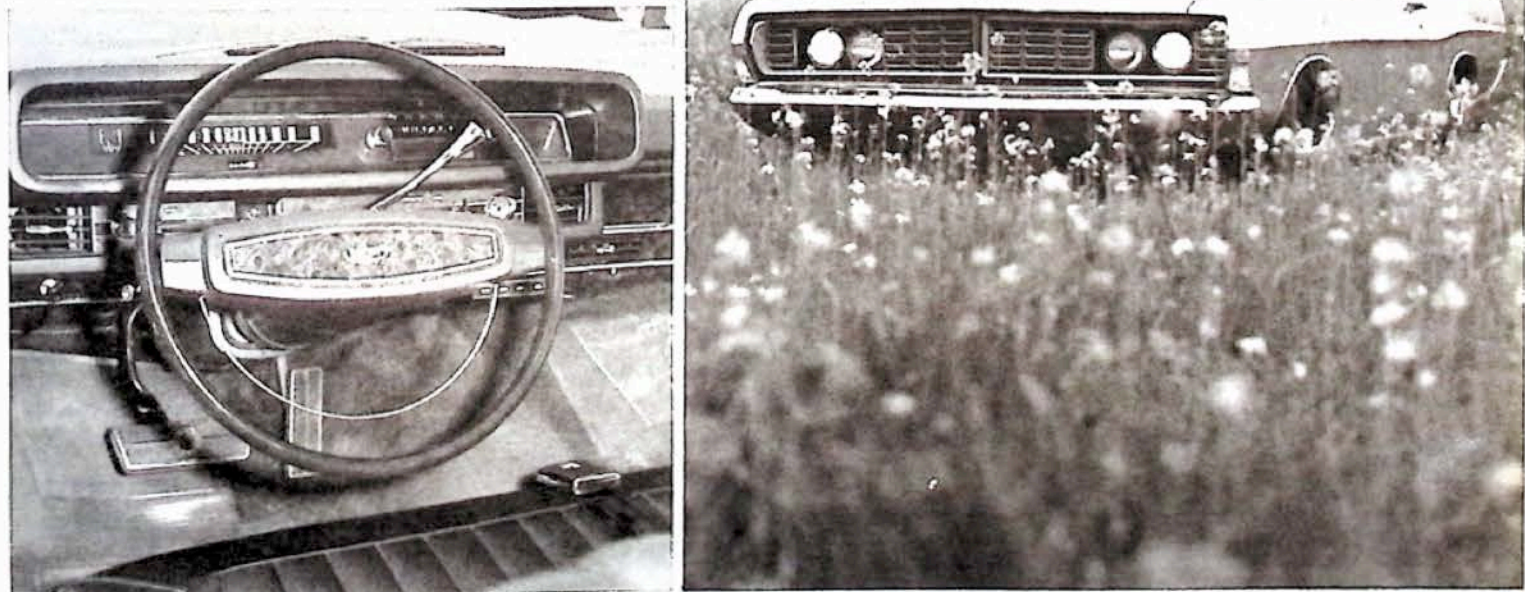
Lincoln Continental

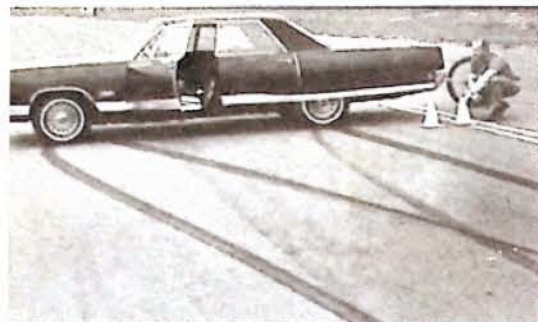
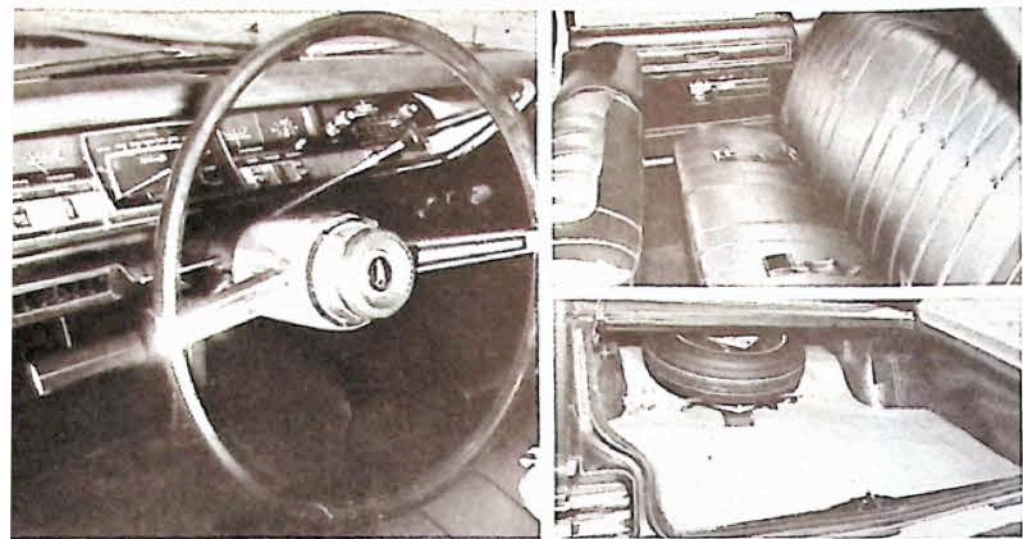
Familiar Continental lines are reflected in pool left by ocean squall. Convenient dashboard location of radio and heater attests to good planning. Six-way power adjustment attains optimum seating position for practically everyone. Trunk dimensions are adequate for luxury-sized car. Handling qualities are disappointing as is wind noise.



Ford LTD

Nylon "panty-cloth" upholstery imparts luxury look without expense of leather. Body solidity and ride are strong points, but steering wheel is positioned at ridiculously high angle without tilting mechanism. Brakes function well, and "whee," so do headlight doors, giving wide look to impressive silhouette as LTD crouches in field of wild flowers.





Plymouth VIP

In right setting, limousine-look is heightened, making VIP a fairly impressive car. Trunk has lowest liftover of all cars and affords plenty of room for American-sized load of luggage. Brakes could give gray hair to a Yul Brynner... panic stop from 60 mph sent car into lock-up broadside, an unpopular trait for freeway driving. Nylon upholstery also has luxury look and feel.



LUXURY *continued*

car. Our LeBaron Imperial had the best arrangement. Window buttons are toggle switches and are by far the easiest to operate. The panel is slanted in the forward part of the door armrest at an angle that makes all the buttons visible—a feature that greatly facilitates their use. Both Cadillac and Lincoln have window buttons flat on the door armrest and can be operated by feel only, a situation that often results in the wrong window going up or down. Ford had the worst location, flat on the door panel, which required an elbow that would bend in a different direction from that achievable by most humans. Unfortunately, the Caprice had roll-up windows, so we couldn't judge the placement of controls in the car.

Chrysler and Plymouth have the best dashboard arrangements and design. They are similar but distinctive. Both feature a high, wide padded top, allowing the dash to be recessed beneath. Because of this arrangement, toggle switches are used and are much more convenient than sliding handles or padded knobs. In place of the wood veneer used on both the Cadillac and Lincoln dash panels, our Imperial had antiqued bronze paneling inlaid across the dash and doors. Cadillac and Chevrolet seem to have too much padding on the dash, which is disconcerting. Cadillac has a good dash layout, but some of the instruments are difficult to reach around the steering wheel. To reach the glovebox from the driver's seat, you have to move far to the right, an impossibility when you are wearing a seat belt. Dash on the Caprice is simple, but far from elegant. It's not much different from the ordinary Chevrolet's. Lights, wipers and lighter are all difficult to get your fingers around, as they are recessed for safety. Stereo system in the Caprice was one of the best, even in comparison to the higher-priced cars! Dash on the Continental was well laid out and more convenient than the Caddy when it came to reaching radio and heater. Lower instruments on the Ford and Lincoln, such as vents and lighter, are down and under and almost impossible to find or reach.

Cadillac has a unique, but complicated speed control system mounted on the dash that allows you to set a pre-determined speed. We liked the system used on the Caprice much better as it involves only a button on the turn indicator lever and is far simpler

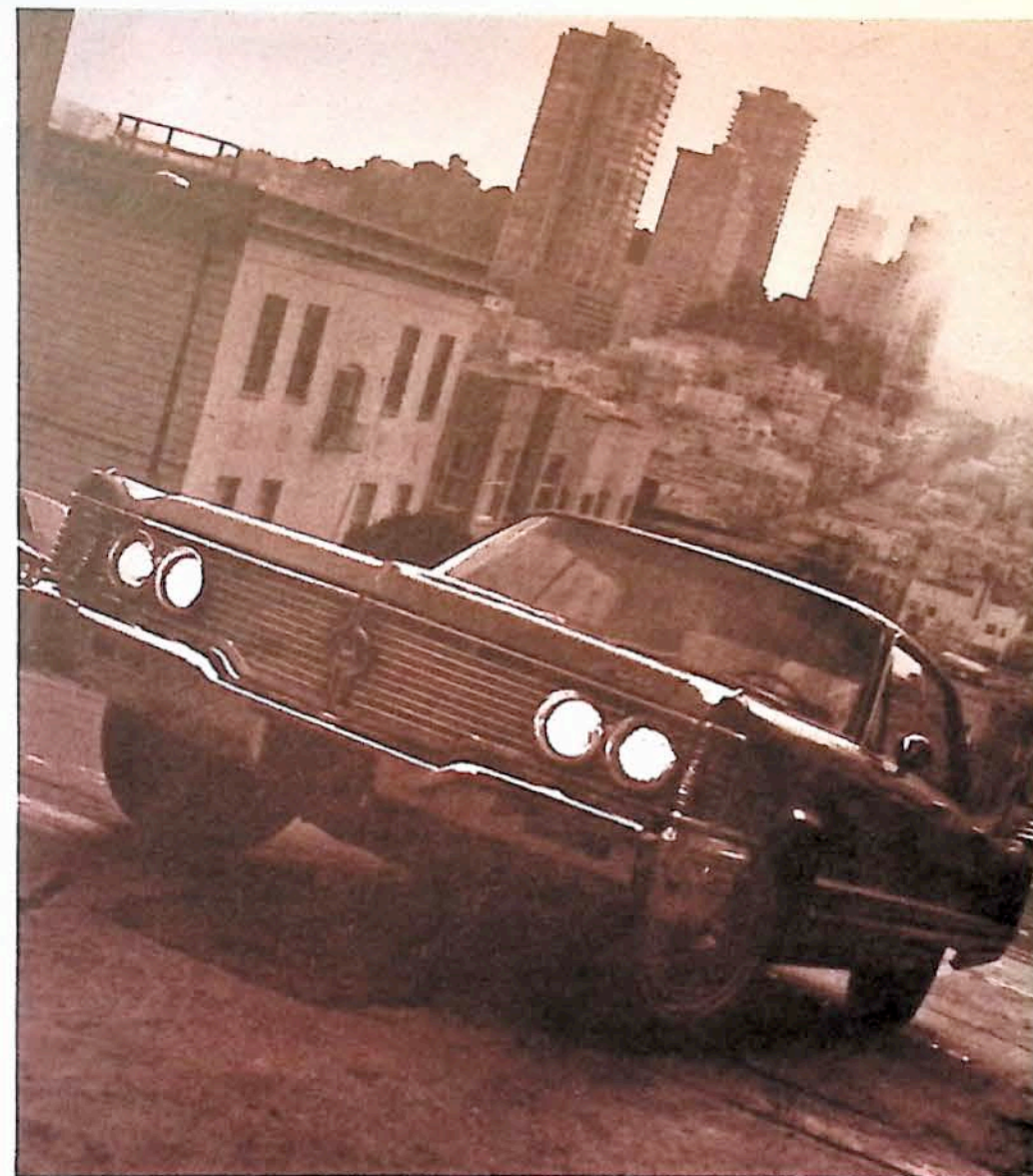
to operate. The Cad system keeps you from going faster than the speed set, which could be dangerous when passing. The Caprice just takes a tap on the accelerator and the speed control is over-ridden. Both cancel automatically when braking. Also well known and offered only on the Cad is the time-delay light switch, which turns the lights off automatically after you leave the car.

Both Chrysler cars have a convenient ignition light that operates on a time delay, it comes on when you open the driver's door and goes off after a brief interval. Rear seat reading lights are offered in each of the big three, and are located in the rear roof quarter panel. Imperial has the best design with lights directed down at an angle. They don't flood the car with light, to the distraction of the driver, as do the others. All three top cars have individual rear seat cigarette lighters, items not found on the lower priced models. And, Imperial goes one better with individual lighters on all four doors.

Chrysler leads the way with steering wheels too. Theirs are by far the easiest to operate, with thin center bars that don't hinder grasp or turning. Lincoln, Ford and Cadillac have cumbersome, thick center bars that get in the way when trying to find a good grip and when steering. The Caprice wheel is better, but not as good as either the VIP or LeBaron's.

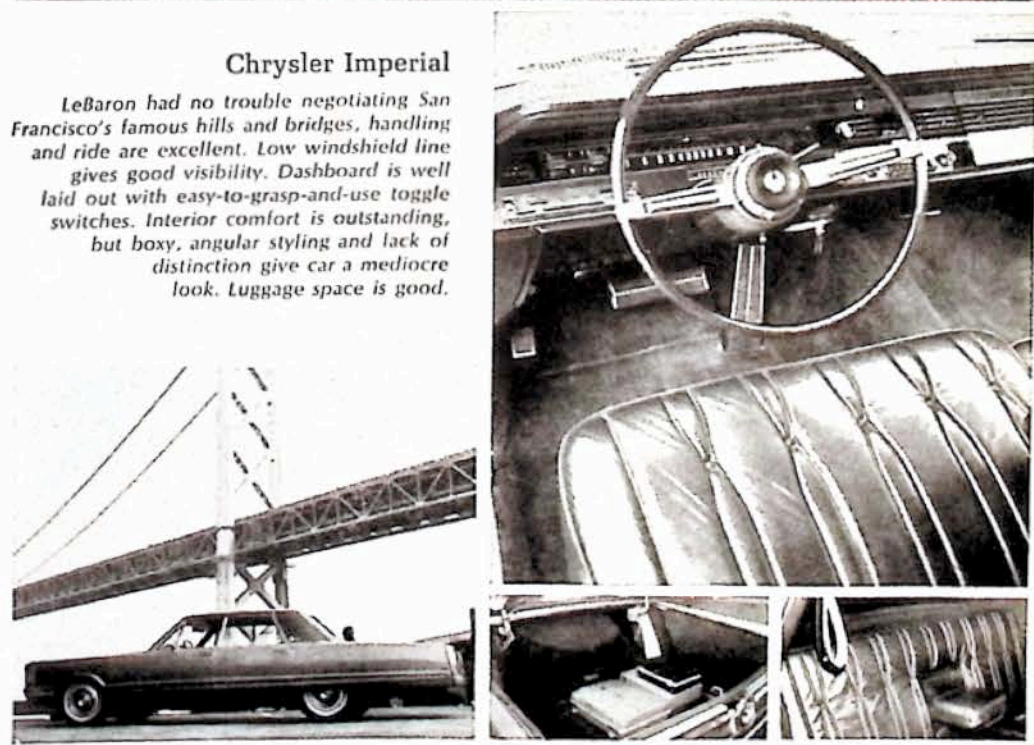
Luggage space varies considerably. Obviously you're going to get more room in a bigger car. Smallest space is in the LTD, although it is rather deep. Lowest liftover of all cars was on the VIP, with trunk floor even with the bumper. Spare tire in all six cars is placed in the forward-most part of the trunk, making it necessary to physically enter the trunk to remove the spare. It's interesting to speculate what a 95-pound woman will do on a deserted road with a flat.

When it comes to ride, we really start to separate the men from the boys. Slice it down the middle. The generation gap is there—wide and impassable. Weight differences range between 1000-1300 pounds (give or take a few) and you know it as soon as the cars start rolling. Ford probably comes closest to a comparable ride with its big brother. The Lincoln is smoother and heavier, but the LTD still gives a solid, heavy feeling in its ride. VIP may look like a limousine,



Chrysler Imperial

LeBaron had no trouble negotiating San Francisco's famous hills and bridges, handling and ride are excellent. Low windshield line gives good visibility. Dashboard is well laid out with easy-to-grasp-and-use toggle switches. Interior comfort is outstanding, but boxy, angular styling and lack of distinction give car a mediocre look. Luggage space is good.





LUXURY *continued*

but when you compare riding qualities with the Imperial, you know it's still a Plymouth. While it has a substantial feel, the Caprice is probably further from the Coupe de Ville than the other two. Our Imperial was the quietest under all conditions, with the Cadillac running a close second. Wind noise around the Continental, with windows up, was unaccountably bad, whistling and howling at any annoying decibel level. On the other hand, LTD showed the least tendency to interrupt conversation among the lower-priced three.

Emotions also run the gamut when it comes to handling. Imperial maneuvers relatively easy for a big car, and we had a 4-door. That is partly due to the higher seats and lower dash and windshield design than in the Cad and Continental, in which you appear to sit much lower. Imperial goes through moderate corners without much roll or sway, while the VIP, in reality a small car, handles atrociously. Cad and Caprice are both nimble and responsive, with the Caprice probably best among the smaller cars. An unusual phenomenon was the deceptive size of the Coupe de Ville, which psychologically aided handling. Outside it looked monstrously long; inside it seemed not much bigger than the Caprice. Continental handling was bad news too, with an unusual amount of correcting necessary to maintain a good road track. While not as responsive or agile as the Caprice, the LTD handles well, much better than the Lincoln. A tilting steering wheel is an absolute must. Our only car without that appendage was the LTD, and the wheel was positioned at such a crazy angle you almost seemed to be steering with arms over your head, a feat that doesn't go far toward aiding handling qualities.

Power steering on all is effortless and is most convenient on the bigger cars. Sometimes it was a little too fast on the lighter cars. Weight added to a more solid feel in the steering.

Braking was rather similar in response and effect, except on the Chrysler boats. Their brakes can be summed up in one word: pathetic. When braking from 60 to 0 mph, our VIP locked up and swerved all over the place. And that was with front discs. Braking had seemed better on the Imperial during a long weekend trip, but at the test track, front disc brakes started

smoking after only a few high-speed stops, and those without full panic pressure. Caprice brakes are good with front discs, but a considerable and frightening amount of nose dip accompanies high-speed stops. Some deviation from the straight was noticed. Cadillac has some mighty smooth brakes on the Coupe de Ville. The big car pulled down straight and even, without any feeling of swerving, either way. Continental and Ford both exhibited the same qualities, and stopped evenly without veering in either direction on a side bias. No fade was noticed in Ford, Continental, Cadillac or Chevrolet after repeated stops.

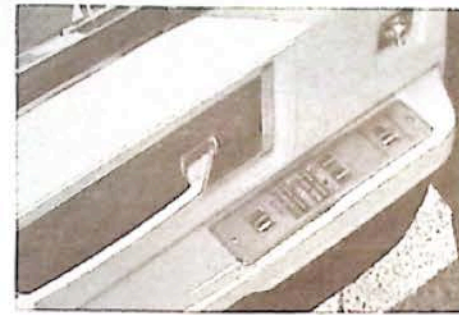
Big engines are used in all the cars we tested. And, big engines are a vital necessity to power all the accessory equipment running off the mill. Tremendous torque output is synonymous with the engines on the bigger cars, and this favorable power-to-weight torque ratio gives them good acceleration and passing speed. Surprisingly, there was little difference in acceleration times, on all cars we tested, when running with and without air conditioners on. In other cars we have tested, especially the big bombs, we noticed a considerable drain on power with air conditioning in operation. Perhaps that fact is taken into consideration on the luxury models and compensated for.

In the final analysis, after testing and comparing these six cars, one overwhelming conclusion is evident. The cars themselves repeatedly and belligerently make you aware of it: there is no compromise with luxury; it has to be a total concept. You can't dress-up a lesser car and get the comfort, feel, ride and "image" of a luxury car. A line from an Aesop fable, *The Fox and the Mask*, states it simply: "Outside show is a poor substitute for inner worth." As with anything you buy, you don't get "something for nothing." With luxury cars, you pay for what you get, and you don't get true luxury unless you are willing to pay for it. There's no other way.

"...Tune that stereo a little, will you, baby, I hear some static. And the left rear speaker is too loud."

There was no movement on the huge, white leather seat next to me. In the opulence of the cool twilight I could see: she was asleep.

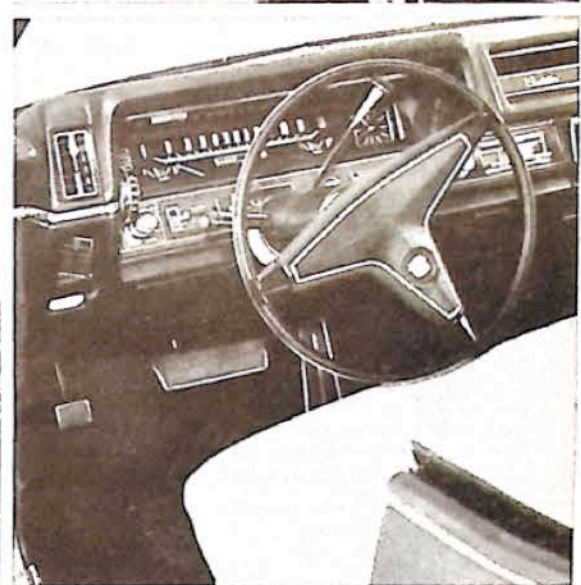
Turn page for specs.



Cadillac Coupe de Ville

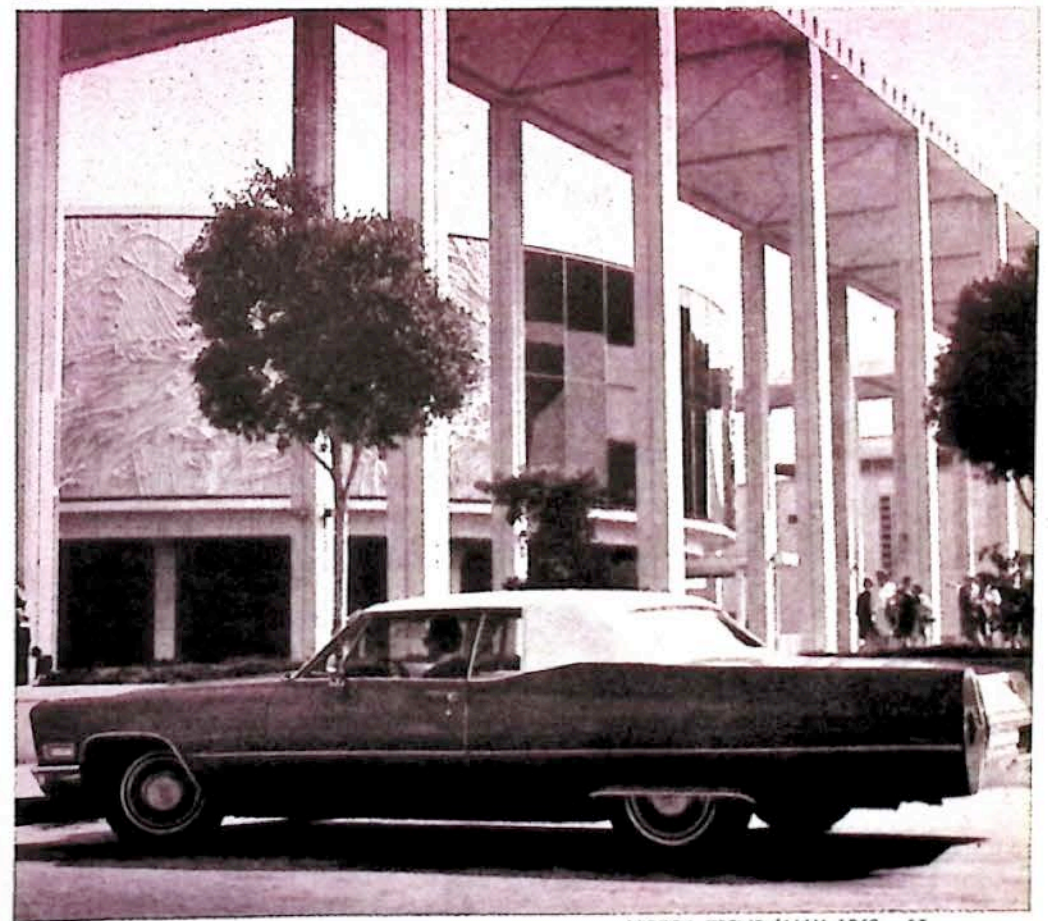
Strong, massive lines and outstanding styling still give Cadillac most ecstatic appearance. From grille to tail lights, Coupe de Ville is still representative of luxury syndrome. Dash is excessively padded and some instruments are difficult to reach, but visual arrangement is good. Ride, handling and brakes are exceptionally well engineered. Interior comfort is plush.

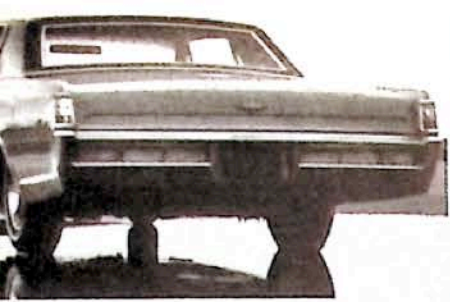
Photos by: George Foon, Bill Sanders, Jerry Stiles



Chevrolet Caprice

New roofline and absence of vent windows add distinctive aura to Chevy line, but Caprice is still a Chevy. Bucket seats and console aren't as luxury oriented as bench seat with fold-down armrest. Braking is first cabin, but Caprice nose dives at wild angle in panic stop from 60 mph. Leather-like vinyl is not as impressive as the real thing, or black nylon in LTD, VIP.





	CHEVROLET CAPRICE	CADILLAC COUPE DE VILLE	PLYMOUTH VIP	CHRYSLER IMPERIAL LeBARON	FORD LTD	LINCOLN CONTINENTAL
PERFORMANCE						
(Performance figures computed in "D" range, without air conditioning working)						
Acceleration (2 aboard)						
0-30	3.4 secs.	3.6 secs.	3.5 secs.	4.2 secs.	3.9 secs.	4.0 secs.
0-45	5.4 secs.	5.7 secs.	5.5 secs.	7.4 secs.	6.6 secs.	6.6 secs.
0-60	8.0 secs.	9.1 secs.	8.5 secs.	12.4 secs.	9.3 secs.	10.6 secs.
0-75	12.0 secs.	13.1 secs.	12.1 secs.	17.4 secs.	13.5 secs.	15.8 secs.
Passing Speeds:						
40-60	4.2 secs., 307.4 ft.	5.0 secs., 366.0 ft.	4.0 secs., 292.8 ft.	6.8 secs., 497.7 ft.	5.0 secs., 366.0 ft.	5.4 secs., 395.2 ft.
50-70	5.0 secs., 440.0 ft.	5.5 secs., 484.0 ft.	5.0 secs., 440.0 ft.	8.0 secs., 704.0 ft.	5.4 secs., 475.2 ft.	6.9 secs., 597.2 ft.
Standing Start 1/4-mile:						
	89 mph, 16.2 secs.	86 mph, 17.0 secs.	86 mph, 17.0 secs.	77 mph, 18.4 secs.	84.1 mph, 16.8 secs.	80 mph, 18.2 secs.
Speeds in Gears:						
1st . . . mph @ rpm	55 @ 5200	48 @ 4400	48 @ 4500	47 @ 4400	52 @ 4000	48 @ 4500
2nd . . . mph @ rpm	85 @ 5200	82 @ 4400	75 @ 4500	79 @ 4400	88 @ 4000	85 @ 4500
3rd . . . mph @ rpm	102 @ 4000	94 @ 4200	106 @ 4500	90 @ 4000	96 @ 3000	98 @ 4000
MPH Per 1000 RPM	18.2 mph	19 mph	15.6 mph	18.9 mph	20.1	19.3
Stopping Distances:						
From 30 mph	24 ft.	27 ft.	35 ft.	46 ft.	32 ft.	33 ft.
From 60 mph	107 ft.	149 ft.	138 ft.	158 ft.	131 ft.	136 ft.
Mileage Range	20.2 - 25.4	9.1-13.2	10.4-11.8	9.2-14.5	12.2-13.8	9.4-15.2
SPECIFICATIONS						
Engine	90° V-8 OHV	90° V-8 OHV	90° V-8 OHV	90° V-8 OHV	90° V-8 OHV	90° V-8 OHV
Bore & Stroke — Ins.	4.25 x 3.76	4.30 x 4.06	4.25 x 3.38	4.32 x 3.75	4.13 x 3.98	4.38 x 3.83
Displacement — Cu. In.	427	472	383	440	428	462
HP at RPM	385 @ 5200	375 @ 4400	330 @ 5000	350 @ 4400	340 @ 4600	340 @ 4600
Torque: lbs.-ft. @ rpm	460 @ 3400	525 @ 3000	425 @ 3200	480 @ 2800	462 @ 2800	485 @ 2800
Compression Ratio	10.25:1	10.5:1	10.0:1	10.0:1	10.5:1	10.25:1
Carburetion	1 4-bbl.	1 4-bbl.	1 4-bbl.	1 4-bbl.	1 4-bbl.	1 4-bbl.
Transmission	automatic	automatic	automatic	automatic	automatic	automatic
Final Drive Ratio — Std.	3.07:1	2.94:1	3.23:1	2.94:1	2.80:1	2.80:1
Steering & Ratio	Power, recirculating ball nut. 21.2:1	Variable ratio power. 16.6:1	Power, recirculating ball nut. 19.12:1	Power, recirculating ball nut. 19.1:1	Power, recirculating ball nut. 21.9:1	Integral gear and power cylinder, recirculating ball. 20.5:1
Turning Dia. — Curb-to-Curb — ft.	41	47.5	42.8	44.9	41	47.4
Wheel Turns — Lock-to-Lock	4.0	2.6	3.5	3.5	3.7	3.8
Tires — Std.	8.25 x 14	9.00 x 15	8.25 x 14	9.15 x 15	8.45 x 15/4	9.15 x 15
Brakes	Front disc, rear drum	Front disc, rear drum	Front disc, rear drum	Front disc, rear drum	Front disc, rear drum	Front disc, rear drum
Suspension	4-wheel coil spring, independent front	4-wheel coil spring, independent front	Independent front torsion bar semi-elliptical leaf rear	Independent front torsion bar semi-elliptical leaf rear	4-wheel coil spring, independent front	Independent coil spring front semi-elliptical leaf rear
Body/Frame Construction	Body/Frame	Body/Frame	Unit	Unit	Unitized	Unitized
Overall Length — Ins.	214.7	224.7	213.3	224.5	213.9	221
Width — Ins.	79.6	79.9	77.7	79.6	78	79.7
Height — Ins.	54.3	54.3	56.3	57.0	53.9	54.2
Wheelbase — Ins.	119.0	129.5	119	127.0	119	126
Front Track — Ins.	62.5	62.5	62.0	62.4	62	62.1
Rear Track — Ins.	62.4	62.5	60.7	61.1	62	61.0
Fuel Capacity — Gals.	24	26	24	25	25	25.5
Curb Weight — Lbs.	3840	4900	4000	5284	3863	5244

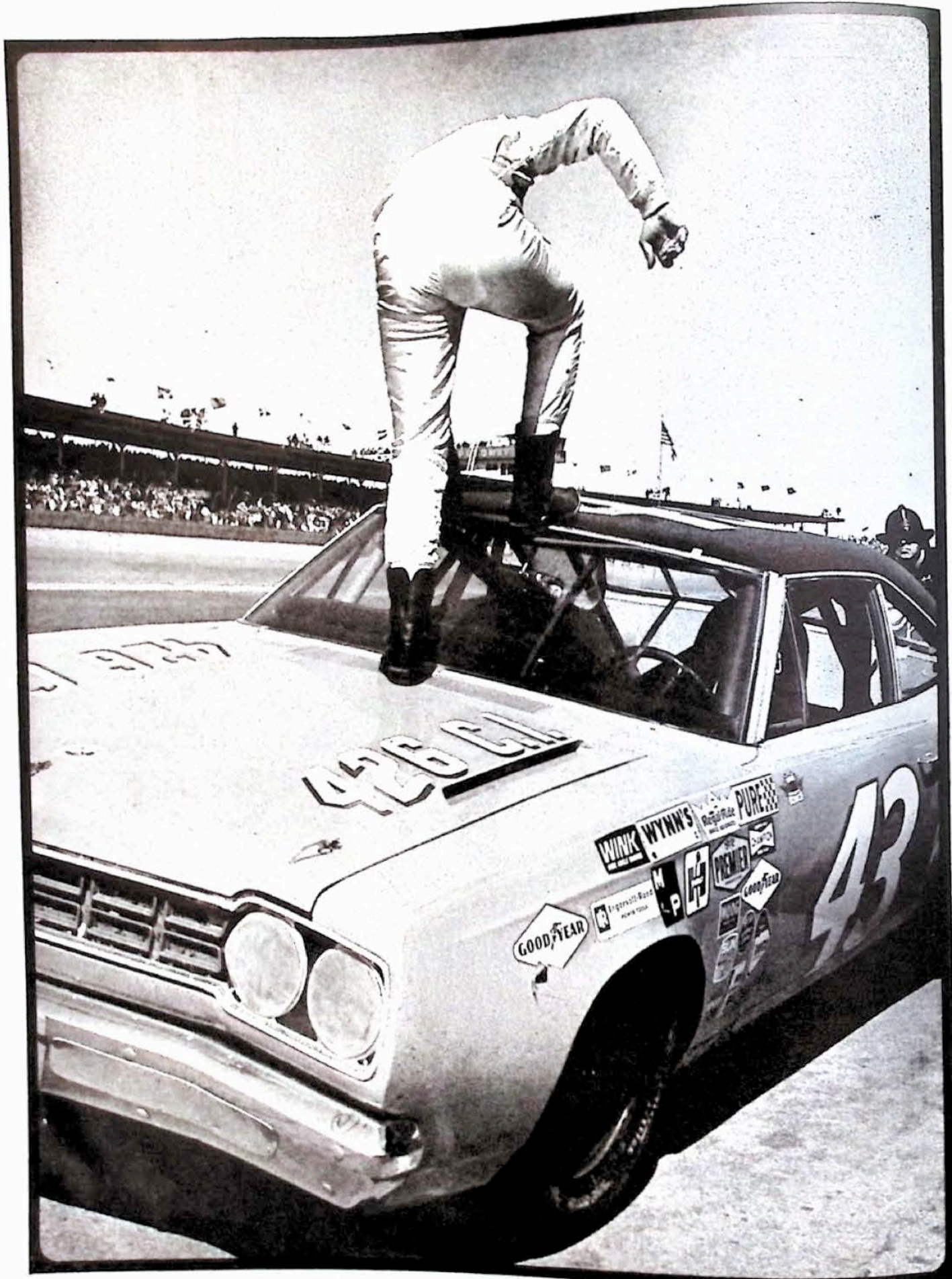
LUXURY OPTIONS AND PRICES

CHEVROLET CAPRICE		PLYMOUTH VIP		FORD LTD	
Retail price as tested:	\$5056.25	Retail price as tested:	\$4728.75	Retail price as tested:	\$4860.80
OPTIONS		OPTIONS		OPTIONS	
Power windows	\$100.10	Vinyl roof	\$ 86.75	Vinyl roof	\$ 84.99
6-way power seats	94.80	Split bench seat w/cloth & vinyl, passenger recline	104.20	Luxury interior trim	112.69
4-way bucket power seat	69.55	383-cu.-in. engine	137.60	Automatic transmission	233.17
Light monitor system	26.35	Basic group: AM radio, power steering, power brakes, 3-speed windshield wipers, remote control mirror	212.75	Power windows	99.94
Tinted glass	39.50	Automatic transmission	216.20	Power steering	94.95
Vinyl roof	89.55	Air conditioning	350.25	Tilt steering wheel	42.76
Strato bucket seats	158.00	Rear seat speaker	14.05	Power disc brakes	64.77
AM/FM radio with multiplex stereo	238.15	Left power seat	90.30	Air conditioning	368.72
Air conditioning	368.65	Power windows	100.25	Stereo tape deck	133.86
Power disc brakes	121.15	Tinted glass	39.50	AM radio	61.40
Tilting steering wheel	42.15			Tinted glass	42.12
Speed & cruise control	52.70			Deluxe wheel covers	56.98
Rallye wheel covers	10.55				
Power steering	94.80				
427-cu.-in. engine	263.30				
Automatic transmission	237.00				

CADILLAC COUPE DE VILLE		CHRYSLER IMPERIAL LeBARON		LINCOLN CONTINENTAL	
Retail price as tested:	\$7467.40	Retail price as tested:	\$8377.10	Retail price as tested:	\$7351.28
(Price differential \$2411.15)		(Price differential 3648.35)		(Price differential 2490.48)	
OPTIONS		OPTIONS		OPTIONS	
Padded roof	\$131.60	Vinyl roof	\$136.15	Vinyl roof	\$136.85
Leather upholstery	137.90	Leather interior	124.55	Leather w/vinyl trim interior	137.26
AM/FM radio with multiplex stereo	288.40	Sure grip differential	56.35	Power front vent windows	71.64
Tinted glass	50.55	Air conditioning	493.45	6-way power seats	83.28
6-way power seats	83.15	AM/FM radio with multiplex stereo	294.85	Spare tire cover	10.95
Automatic climate control heater/air conditioner	515.75	Power door locks, electric	70.70	Tilt steering wheel	66.95
Power door locks (2 doors)	47.40	Interior deck lid release	29.60	Interior deck lid release and speed, cruise control	134.56
Tilt/telescope steering wheel	89.50	Tinted glass	52.70	Rear window defogger	42.20
Automatic headlights	31.60			Air conditioning	503.90
Interior deck lid release	52.65			AM radio, stereo tape deck	244.54
Front disc brakes	105.25			Automatic headlight dimmer	50.05
Rear window defogger	26.35			Tinted glass	52.53
Speed & cruise control	94.75			Power door locks	47.45
Automatic headlight dimmer	50.55				
Power front vent windows	71.60				
Automatic level control	78.95				

COMMENTS		
CHEVROLET CAPRICE	PLYMOUTH VIP	FORD LTD
<p>WE LIKE:</p> <p>Multiplex stereo radio and speaker system . . . good performance . . . hidden ash tray design and placement on console . . . easy rear seat entry . . . solid body and good ride.</p> <p>WE DON'T LIKE:</p> <p>Bucket seats in luxury car . . . horizontal sliding levers for heater, air conditioner . . . difficult to grasp, padded switches . . . recessed ignition . . . center console with horseshoe shift lever.</p>	<p>WE LIKE:</p> <p>Dash layout . . . easy to operate toggle switches . . . thin bar steering wheel . . . fender mounted turn indicators . . . time delay ignition light . . . rear seat leg room . . . low liftover in trunk . . . big car feeling . . . twin armrests for front seats . . . front visibility over hood.</p> <p>WE DON'T LIKE:</p> <p>Brakes . . . quality control . . . recessed ignition . . . radio too far from driver . . . small glove compartment . . . not quite comfortable seating positions . . . difficult front seat exit . . . handling.</p>	<p>WE LIKE:</p> <p>Seating comfort . . . styling . . . ride . . . thickly padded upholstery and simulated tortoise leather trim . . . performance . . . attention to detail . . . quiet operation . . . handling.</p> <p>WE DON'T LIKE:</p> <p>Steering wheel position . . . location of power window buttons . . . thick steering wheel bar . . . padding around dash makes reading instruments difficult . . . poor location of emergency brake warning light . . . lower switches difficult to reach . . . radio system.</p>

CADILLAC COUPE DE VILLE	CHRYSLER IMPERIAL LeBARON	LINCOLN CONTINENTAL
<p>WE LIKE:</p> <p>Automatic headlights . . . styling . . . ride . . . solid body . . . extremely soft woven carpet . . . good acceleration and performance in big car . . . soft leather . . . stereo radio and dial . . . lighter, ash tray in one unit . . . excellent steering and handling . . . seating comfort . . . thermostat climate control.</p> <p>WE DON'T LIKE:</p> <p>Complicated cruise/speed control . . . narrow rear entry in coupe . . . excessive padding on windshield posts and dash . . . wide, padded center bar on steering wheel.</p>	<p>WE LIKE:</p> <p>Bronze finish panels on dash and doors . . . individual lighter in each door . . . slanted power toggle switches on door armrest for easy visibility . . . rear compartment reading lights . . . time delay ignition light . . . seating comfort and ride . . . maneuverability . . . stereo system . . . lift-up metal door pulls . . . quietness . . . individually operated front power seats . . . door glove compartments . . . thermostat air temperature.</p> <p>WE DON'T LIKE:</p> <p>Styling . . . brakes . . . quality control . . . overload cutoff when power front seats are operated simultaneously . . . small front glove compartment . . . non-solid feeling of body . . . rear fender bumper projection.</p>	<p>WE LIKE:</p> <p>Good instrumentation . . . wooden steering wheel . . . thermostat temperature control . . . solid body . . . dash layout . . . seating comfort . . . clean lines.</p> <p>WE DON'T LIKE:</p> <p>Wind noise . . . foot tiring position of accelerator pedal . . . handling . . . awkward position of cruise/speed control on-off buttons . . . steering wheel center bar . . . narrow rear seat entry-way.</p>



by ERIC DAHLQUIST

Up, up and away! Richard Petty mounts the cabin of his fastest-of-all-Plymouths in an attempt to beat the top back down where it had bulged up. Now why would a perfectly stock top behave in such a manner?

MOTORSPORTS

DAYTONA: Unsafe at Many Speeds

This was the year it finally happened at Daytona — technology out-paced man's ability to cope with it. The race may never be the same again.

Florida hangs at the throat of America like a jade pendant — cool, deep, tropically lush with facets of sparkling water — pools where steam floats up into the morning, rivers that weave and wander mindlessly across the flatland like psychedelic mirrors; breakers that beat upon endless stretches of glistening sand — high-rise hotels that jut angularly above a palm roof carpet. It is the soaring hotels that impress you most as you drive back from the track up Volusia Avenue and across the Inland Waterway. You expect them in Miami; they seem to have almost always been there. But not Daytona Beach where ro-coco spinoffs of the golden '20s, properly gingerbreaded and shuttered, lurk in sheltered groves waiting eternally for the echo of Bogart in Key Largo-esque dialogue and the next hurricane. That world is doomed. They are making Florida over, molding it in the image and likeness of Late-Neon-Used-Car-Lot, circa 1968.

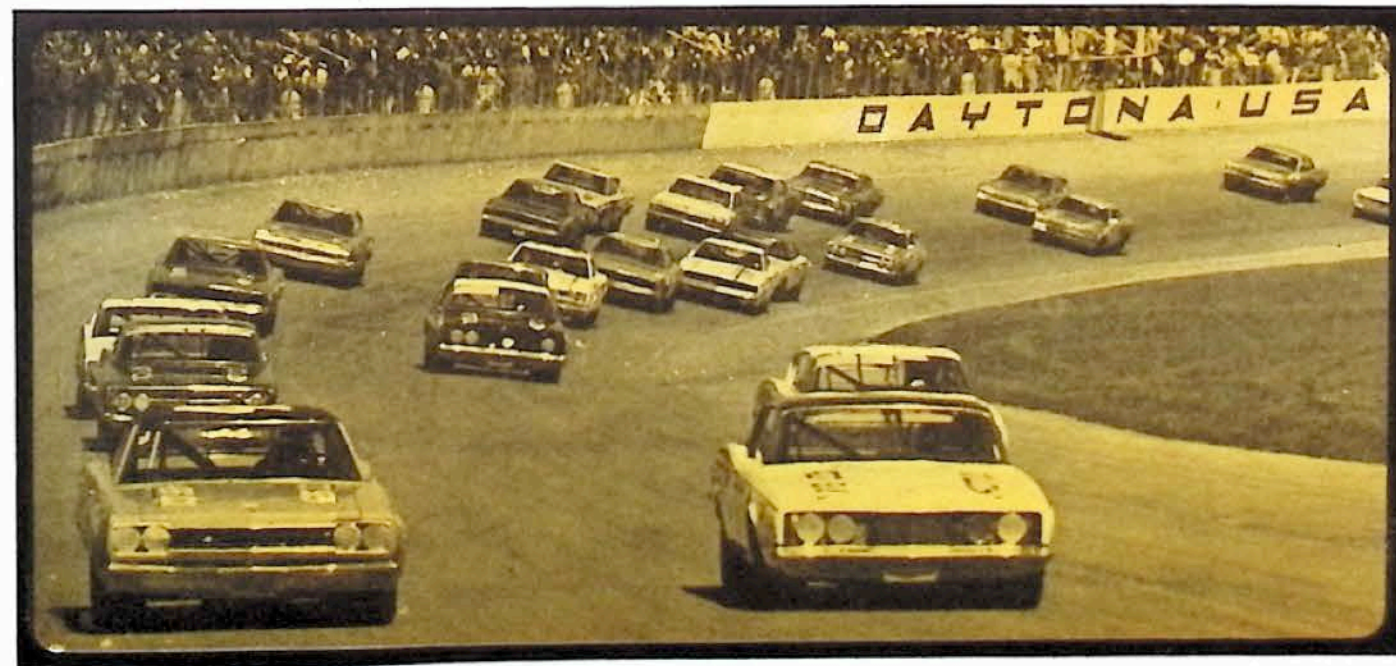
The independent racer is doomed, too. He didn't have to go to Daytona to find that out. "Bigger" and "better" are the catch words of America, everybody knows that. Too bad for you if you don't measure up. So what if sweet restless progress had made you obsolete, retrain and go into computer programming? How do you hack a clear 10 mph jump in pole qualifying speeds in one year? How do you hack not being able to buy the hot setup even if you could afford it? And would it all be worth it anyway?

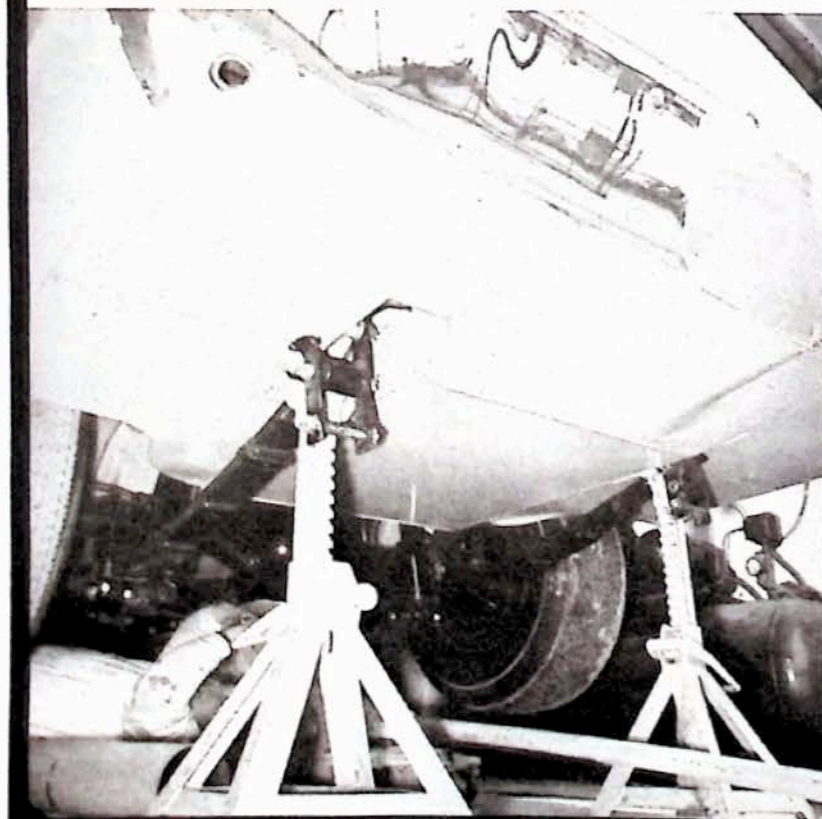
You see, there was one little hang-up this year: 1968 was the point where technology passed man on the back straightaway, where the state-of-the-art became the master. First there were the tire tests back in the closing days of 1967. The Fords ran consistent laps of 183-185 mph with one or so at 186, and the drivers found themselves in the threshold of a twilight zone where the car no longer responded predict-

ably to command and the miscalculation margin vanished. The shock waves from this discovery ricocheted around the Southeast in a couple of days and by Riverside at the Motor Trend 500 a general atmosphere of impending disaster hung over the proceedings like the close, muggy feeling in the air before a violent electrical storm. When Cale Yarborough qualified the Wood Brothers' Montego Cyclone GT on the pole at 189.22 mph, nearly 4 mph faster than the tire-test speeds, the fat was in the fire; the sometimes unpredictable cars now had no tires available with proved sustained 200-mph-plus capability.

These events beg two questions. First, if the Mercs (and Fords) were 190-mph cars all along, why had they not showed it at the tire tests? And, how did they ever manage a 10-mph increase over Smokey Yunick's infamous 180-mph Chevelle of only a year be-

continued





DAYTONA *continued*

An unfair comparison between Richard Petty's super-Grand National Plymouth (top) and the machine prepared by Mario Rossi for Darel Dieringer. Black paint on Richard's top was supposed to have some mystical aerodynamic advantage but we who know about laminar flow and that other trick stuff realize such 2-toning is more effective at distorting the true proportions of the car. Although not quite in a league with Smokey's Chevelle or Camaro, the Pettys still managed some clever innovations that allowed them to be competitive with the flying Fords and a clean 6 mph faster than any other MoPar. From the front end, which was about as streamlined and air-tight as you can get without more obvious modifications, to the rear (left) which featured what amounted to a full belly-pan, the car was a master-stroke of wind cheating science. One factory observer, after pouring over comparison silhouettes of the Plymouths for the entire week commented, "It looks like an airplane."

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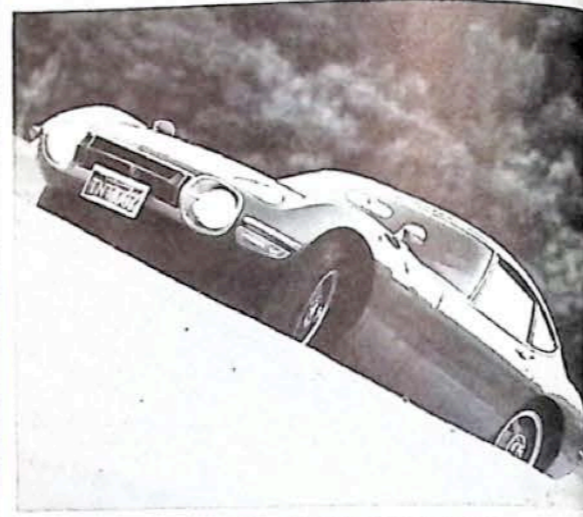
Photos by Don Hunter

**BEST IDEA YET IN
PICKUP LUXURY!
ALL-NEW RANCHERO
BY FORD**



Imagine! A pickup that generates all the vibrant excitement of the raciest sports cars. All the performance. All the luxury. That's Ford's all-new Ranchero—longer, lower, livelier for '68! Inside you can have luxury without limit: color-coordinated styling, all-vinyl seat trim, bucket seats, full carpeting, AM/FM stereo radio, SelectAire conditioning. And for spirited going, Ranchero offers Six or V-8 power up to 325 horses. 3- or 4-speed manual transmission or SelectShift Cruise-O-Matic for both manual or automatic operation. Three new models, including a pulse-pounding GT. Ranchero—Ford's bright new idea in pickups. Watch it turn you on!





Laymen like to compare the 2000 GT with England's perennial Symbol, but the exotic little Oriental bomb is a standard in itself. The deck lid/rear window closes with a firm note of pressure, not a "clank." Rear window is laced with heating wires. Luggage space is minimal, but then, you can always buy a domestic station wagon.

by Bill Sanders

If Japan's largest auto manufacturer, the Toyota Motor Co., ever decides to build an international luxury car, Rolls Royce, Mercedes, et al, had better be prepared for some rough competition. Toyota's first experiment in the luxury Grand Touring marketplace — the Toyota 2000 GT — is such an outstandingly superb example of what motoring is supposed to be all about, you wonder where they could possibly go from here.

Here happens to be a fantastic engineering masterpiece on wheels, a magnificent manifestation of complete automotive ingenuity. To perpetuate the Japanese myth, Toyota must have sent an army of black suited engineers, with Nikkon cameras, out to the auto capitols of the world to observe and record. Back home they collected their massive pile of data, looked, sifted, then looked some more. Using the best and most advanced ideas and features from around the world, they then proceeded to build a car from the wheels up. Their efforts have paid off with approbation. It's not a Porsche 911 (displacement). It's not an E-type Jaguar (styling). It's a 2-liter Toyota and it's on its way. And, you better believe it.

Powertrain & Performance

Toyota went the 6-cylinder route on engine choice, partly for production and partly for promotion. The 2000 GT uses the same block, rods and crankshaft as the Crown sedan. The similarity ends there. A Kafkaesque metamorphosis has taken place, and the emergent double overhead cam

engine is a wildly powerful, rugged performer that somehow manages to also maintain a smooth, composed idle. Opening the hood reveals a soul satisfying sight. Refreshingly absent are the hoses, belts, wires, etc. that seem to strangle Detroit engines in a jungle of entwining suffocation. All you see on top of the 2000 powerplant are two beautiful machined cam covers, six spark plug wires and three Solex carburetors. Proof that even a finely engineered, complex engine can remain clean and uncluttered externally with a little planning. A 1000-1200 rpm idle seems to be normal, with no excessive noise at idle or at speed. Even with the hood up, noise is minimal, considering this is a chain driven system.

Overhead cams are operated by a primary and secondary chain setup. Both have a sturdy guide system that accounts for the low level of mechanical noise. In conjunction with the overhead cams and valve arrangement, both intake and exhaust manifolds are located exactly opposite for a direct flow effect that produces exceptionally free breathing. Compression is a mild 8.4:1. Valve angle creates a hemispherical combustion chamber with centrally located spark plugs. As mentioned above, carburetion is supplied by three 2-throat Solex PHH side-drafts. These are produced by Mikuni under a licensing arrangement. Rated at 150 hp @ 6600 rpm, the engine produces 130 lbs.-ft. torque at 5000 rpm. An engine feature that distinguishes the "class" appeal of the 2000 is an aluminum oil cooler which is standard equipment.

A tight, compact, short-throw, all syncromesh 5-speed gearbox is used in the 2000. Tight might be an understatement. Shift throws had to be executed with considerable force, a situation that should rectify itself with continued use and complete break-in. Thankfully, the transmission didn't feel like a bowl of mush. An annoying vibration with accompanying howl made itself quite apparent in 3rd and 5th gears in our test car. This manifestation was in the driveline and definitely didn't emanate from the engine. But, we were unable to determine if it was inherent in the car or could be corrected. That was the only criticism we could find in the otherwise excellent performance characteristics. A limited-slip differential is used with standard final drive ratio of 4.375:1. Ratios of 4.111:1 and 4.625:1 are listed as options.

Engine performance is formidable, with smooth, quick acceleration and a clutch that never complains. Obviously the 2000 isn't a drag machine, but it can surely hold the road with any iron cradling a powerplant with double or triple the displacement. For those raised on American V-8s, the relatively high rpms on the 2000 engine will necessitate some experimentation. Around town you usually run out of street attempting to reach six grand, and ultimately wind up driving in 2nd or 3rd gear at well below that figure. On the highway you can run at a good engine speed in 3rd or 4th. Fifth gear, which everyone would want to try, has its own problems. To maintain good rpms, speed is out of sight.

TOYOTA 2000GT

Toyota has put the GRAND back in Grand Touring



TOYOTA 2000GT

Like 125-130 mph. Where allowed, though, overdrive 5th is good for cruising at 70 mph and adds greatly to economy.

Handling, Steering & Stopping

If the 2000 has one outstanding trait that outshines all its other tantalizing features, it has to be handling. You couldn't ask for more from a GT car. Even though many manufacturers are going to the 2+2 body, Toyota started with a 2-place machine and stuck with it. That decision kept the profile exceedingly low, even more so than pictures would indicate.

As we slipped behind the wheel for the first time, we knew again how a machine like this can become an escape mechanism for all the pent-up aggressions and tensions the human system can develop. You sit low. Seat-backs are raked at just the right angle. Looking out at the front fender peaks you aren't just in a GT car. Suddenly you're at the wheel of a Group 6 sports prototype. The Walter Mitty in you takes over and you're at the starting line at Daytona or Le Mans. This car can do it to you. It so closely resembles a sports prototype in looks and handling, the analogy is uncanny.

Suspension is independent at all four corners, using A-arms both front and rear. Lower rear A-arms are adjustable, and are similar to those used on most race machines today. Rear shock/spring assemblies are mounted over each axle and extend into tunnels

beside the rear windows, à la Lotus Elite. Frame is a spinal member, similar to that used on the Granatelli Indy turbocar. There are no side frame members, so door sills are also extremely low for easy entry and exit.

Because the 2000 has such a low center of gravity, soft springs are used, without sacrificing anti-roll qualities. The result is fantastic roadholding characteristics combined with an unusually comfortable ride. Cornering is effortless and smooth, and doesn't require any of the accustomed spirited driving that has become synonymous with sports cars. Both padded door armrests and padded center console armrest are at precise elbow height. Just sit back with the wheel between your knees and make your line. On long winding bends, or short, sharp curves, aim it and the 2000 does the rest. Even bumpy roads and dips have no effect on the ride or handling qualities.

Rack-and-pinion steering is light and responsive with 15.0:1 ratio. Steering is neutral in most normal driving conditions, but mild oversteer can be developed with added throttle use. The 2.67 turns lock-to-lock allow the 2000 to maneuver easily and quickly. Turning circle is 32.8 feet. An adjustable steering column is standard.

As would be expected, brakes are as impressive as the rest of the car. The 2000 is the first Japanese production car to feature 4-wheel disc brakes. Fronts are 11 inches and rear 10.5 inches. Stopping, too, was fast, straight and easy with the vacuum assist. No

fade or lock-up was ever encountered. Hand brake operates mechanically on the rear wheels and is an upside-down "L" handle that pulls out of the middle of the dash. Dunlop 165-15 SP-41 tires are standard as are magnesium wheels.

Comfort, Convenience & Ride

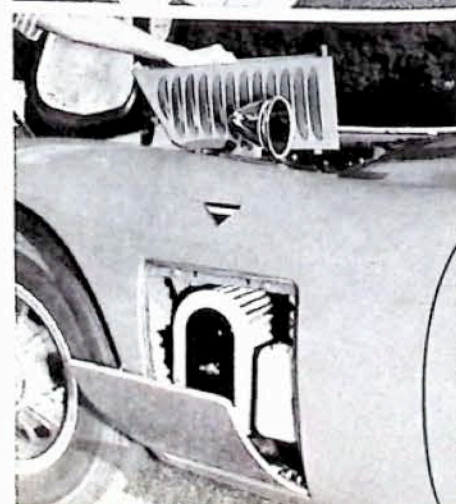
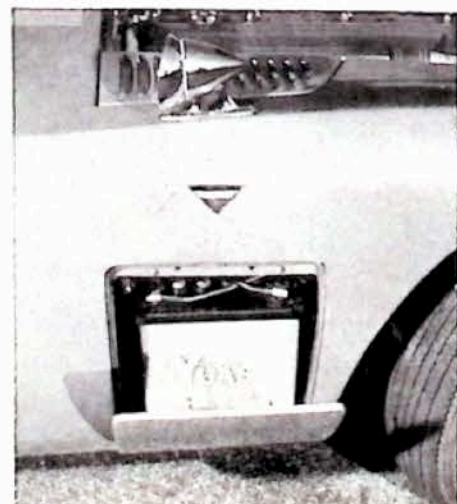
If you aren't driving the car yourself, sitting or riding in it is the next best thing that could happen to you. The driving compartment is a refined exercise in impeccable taste, simple elegance, and, above all, it reflects the almost lost art of quality craftsmanship. Every detail is an act of perfection. Seats are comfortable both in position and contour. Legroom is adequate on both sides, although our knees sometimes touched the bottom of the dash when braking and clutching. A 6-footer can fit with ease. Our test car interior was done in black grained vinyl as glove soft as real leather. Arrayed across the top center of the dash, canted toward the driver, are a row of instruments, including oil temperature gauge. These are all covered with non reflecting glass. Located behind the steering wheel, directly in the driver's sight are the 160 mph speedometer and the 9000 rpm tach. The dash and center console paneling is real rosewood; no fake veneer can be found in the 2000. Below the center instruments are the clock and an unusual rallye clock that operates as a stop watch, indicating seconds, minutes and hours.

The 2000 AM radio has to be the



(Left) Luggage area lacks the size, but has the luxury of a living room. It's fully carpeted, and hides some pretty classy details (right) such as a complete tool kit and the spare tire. (Below, left to right) Interior is space-age, and entry is surprisingly easy over low door sills. Dash is rosewood, as is console center, and luxury items include signal-seeking AM-FM radio with electric antenna. Prototype reports claimed that ventilation was very bad in first model, but all that has changed. Air is fed to passengers from all corners. Instrumentation is all angled toward the driver, and very well placed. Battery is in right front fender, air cleaner is in left.

Photos: Bob D'Oilvo & Gerry Sillia



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Proved first in the East African Safari, proved again by victory in the 1967 Pikes Peak Hill Climb, and still the Columbus shock absorber torture tests go on! In the 1,300 mile, 24-Hour Mexican Rally, a Columbus-equipped American car finished first in class, won the hill climb and was third overall. Here's what the driver, Jurgen Friedrichsen, had to say: "The shocks gave me perfect stability . . . even though they were put to tremendous strain over bumping roads. We found only a very slight softening. I therefore recommend the use of Columbus shock absorbers for rallying." You, too, can ride with the winner. Just ask for Columbus at your dealer.

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- Please send me _____ Mexican Rally Serapes, postpaid. Sizes: _____ Medium (36 to 40) _____ Large (42 to 46). I enclose \$5 (check or money order) for each Serape ordered. (Serape orders can be accepted only from the United States, excluding Hawaii and Alaska)
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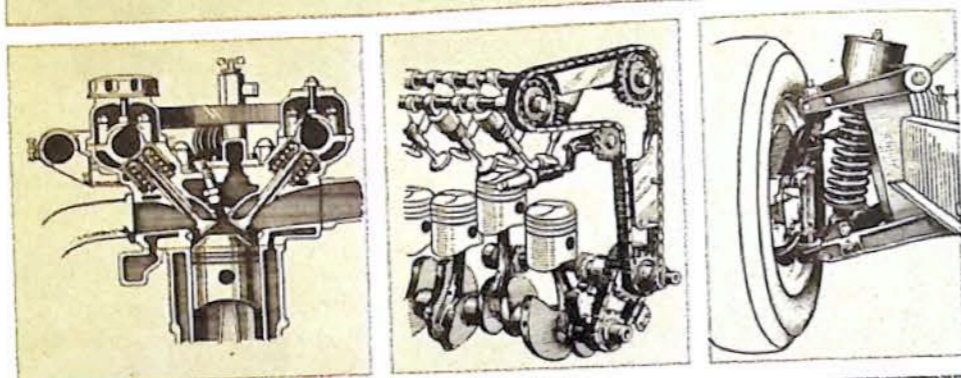
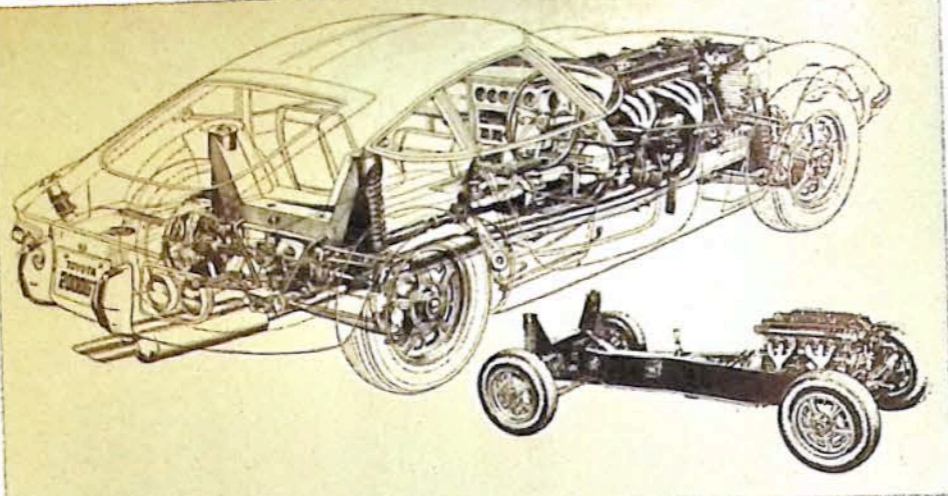
NOTE: Offers expire on Dec. 1, 1968. We cannot accept orders after that date.

TOYOTA 2000GT

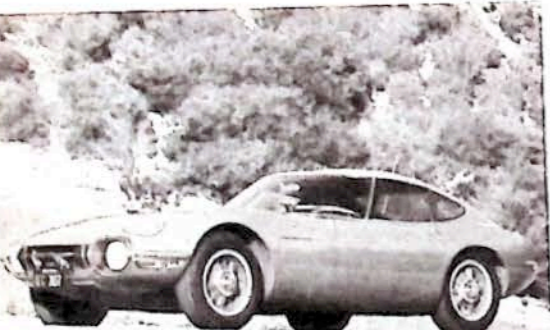
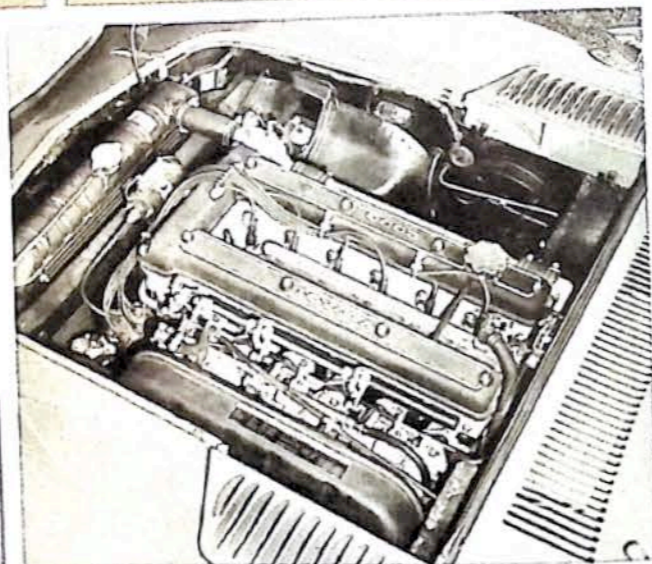
mind bending, complete end. A toggle switch, which raises and lowers the antenna, turns the radio on and off at the same time. The radio contains an automatic, signal-seeking device that is activated by a push on the volume knob. As it moves from station to station, the dial stops at each for about 10 seconds. When the desired station is reached, another push on the volume knob holds that station.

Heat and ventilation controls are on the lower portion of the center dash. Directional signal is also a toggle switch located on the left side of the dash. Strangely, the directional signals are not self-canceling after you complete a turn. Another fascinating item is the engine cooling fan that operates only when the engine reaches a predetermined temperature. A green light on the water temperature gauge indicates when the fan is operating.

A fully carpeted rear luggage area is reached through the deck lid or from behind the seats. Spare is located under the rear luggage space, as is an unusually comprehensive tool kit. Each door contains its own lighter and ash



Stripped of its almost immorally erotic body, the Toyota 2000 GT can be even more seductive. Mechanically, it's simply beautiful, with a spinal-member frame giving it excellent roll stiffness. Both intake and exhaust manifolds are located opposite each other, and a primary and secondary chain arrangement operates the dual overhead cams. Suspension is independent with huge coils all around. Engine area is immaculate.



tray and there are two glove compartments—one in the dash and one behind the center console. The locking gas cap fits and locks like an expensive wall safe. Only one complaint could be found regarding the interior, and that is the excessive glare that results from the dash top reflecting in the windshield at certain times of the day.

A thoroughbred animal, the 2000 creates its own brand of excitement, all the while maintaining its aura of dignity and class. And, you won't find many production GT cars that offer such impressive driving qualities. If you're looking for a car in the GT clan and you can afford \$7230, we don't see how you could go wrong with this Toyota. /MT

PERFORMANCE

Acceleration	3.4 secs.
0-30 mph	6.0 secs.
0-45 mph	10.1 secs.
0-60 mph	13.4 secs.
0-75 mph	
Standing Start 1/4-Mile:	
17 secs., and 89 mph	
Passing Speeds:	
40-60 mph	4.7 secs.; 344 ft.
50-70 mph	5.6 secs.; 492.8 ft.
Speeds in Gears @ Shift Points:	
1st	38 mph @ 6500 rpm
2nd	72 mph @ 6500 rpm
3rd	100 mph @ 6500 rpm
4th	100 mph @ 5500 rpm
5th	86 mph @ 4000 rpm
MPH Per 1000 RPM in 5th Gear:	19.8 mph
Stopping Distances:	
From 30 mph	30 ft.
From 60 mph	144 ft.
Speedometer Error	
Calibrated Speedometer	30 45 50 60 70
Car Speedometer	34 49 55 65 74
Mileage Range:	19.9-21.5 gals. Average: 20.6

SPECIFICATIONS

Engine: 6-cyl. in-line, dohc. Bore & Stroke: 2.95 x 2.95 ins. Displacement: 121.4 cu. in. HP: 150 @ 6600 rpm. Torque: 130 lbs.-ft. @ 5000 rpm. Compression Ratio: 8.4:1. Carburetion: 2 Mikuni-Solex 40 PHH. Transmission: 5-speed, synchromesh on all forward gears. Ratios: 1st, 3.143; 2nd, 1.636; 3rd, 1.179; 4th, 1.000; 5th, 0.844; reverse, 3.238. Final Drive Ratio: 4.375:1. options: 4.111, 4.625:1. Steering: Rack and pinion. Steering Gear Ratio: 15.0:1. Turning Diameter: 32.8 ft., curb-to-curb. Wheel Turns: 2.67, lock-to-lock. Tire Size: 165HR-15. Brakes: 4-wheel, vacuum-assisted discs. 11-in. front, 10.5-in. rear. Suspension: Front & rear: independent with wishbones, coil springs, torsion bar type stabilizer and hydraulic telescopic shock absorbers. Fuel Capacity: 15.8 gallons. Curb Weight: 2480 lbs. Body/Frame Construction: Steel backbone frame with welded semi-unit body. Wheelbase: 91.7 ins. Front Track: 51.2 ins. Rear Track: 51.2 ins. Overall Length: 164.4 ins. Width: 63.0 ins. Height: 45.7 ins.

STANDARD EQUIPMENT

Heater, signal-seeking AM radio, electric antenna, rear window heater, clock, rallye clock, fog lights, back-up lights, magnesium wheels, telescoping steering wheel. Suggested Retail Price: \$7230.00.

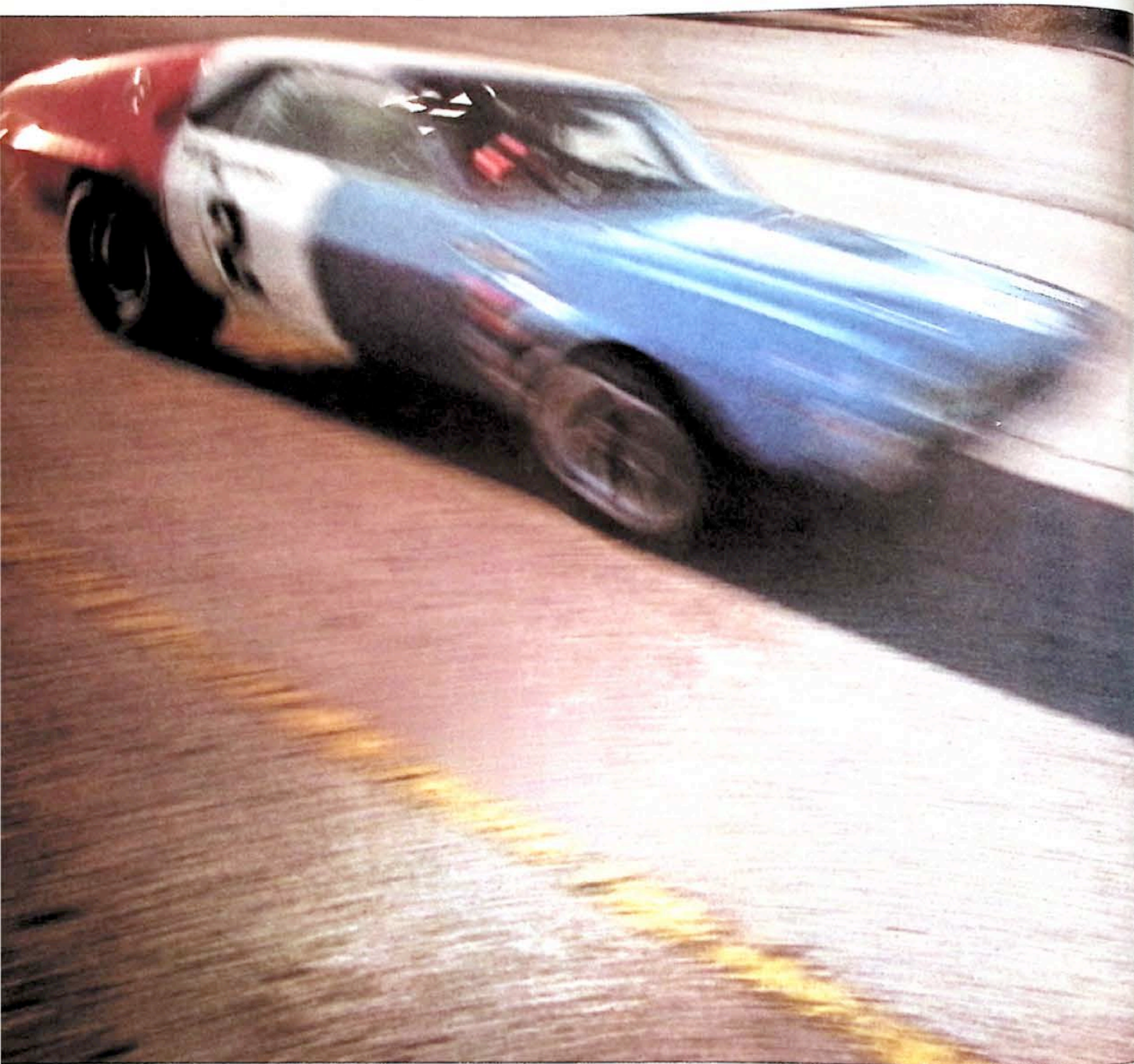


You can't win 'em all.

But . . . year after year, race after race, PURE Firebird® gasoline powers more winners than any other brand in the world. About 4 out of 5, as a matter of fact. PURE is the Number-One supplier of racing gasoline in the world. First in wins, first in records, and first in racing experience.

Put this winning tradition of power to work in your car, with PURE Firebird Super, from the Number-One name in racing.





RECORD AMERICAN BLAST

"Hey, turn on those lights!" a voice shouts from the dark. Two Rebel sedans churn wildly backward, narrowly missing collision, then swing to bring their headlights to bear on the banked track. "Cut," someone else yells and everything goes back to its original starting point and begins over — the command, the car's churning backward, the narrowly missed crash, the headlights on the track, and the settling dust, filtering through the arc-light's beam.

Craig Breedlove is supposed to be out there in the pitch Texas blackness, see — only he's not standing still like you'd expect because you can just about make out the outline of the terrain in the moonlight; he's running at about 153 mph in an AMX with no headlights, breaking the international Class C 24-hour record that Smokey Yunick set at Bonneville last fall, and he needs something out there to see by. Or at least he would need some illumination if he really were running, but he's not. He's backing up a big Shell gasoline tank truck so it will be in position when the movie people are ready to recreate the pit stop action.

It's like the apex of commercialism. Here in Marlboro Country, where a sunset has just faded that the Lone Ranger would have given his silver bullet and Tonto to ride off into, Craig Breedlove is easing this yellow Shell gas truck back so it will be in the picture subliminally with Goodyear and STP and whoever else has some dough in the project. It won't be like Smokey and Mickey Thompson when they went up to the Salt, broke all those records and nobody knew about it. American Motors isn't taking any chances — they can't afford to. When Craig has the Class C and B records there will be a lot of commercials and press releases, plus a full length documentary movie starring Craig, his wife, Lee, and Ron Dykes who co-drives and yells, "Hey, turn off those lights!" There may even be a magazine article.

You can't go anywhere in this part of Texas without crossing the Concho

River. In fact, depending on how you hit the Concho you might almost consider the place a kind of land-locked Venice. "You know, if I lived here," Craig offered, as we drove along a particularly peaceful stretch on the way out of the airport to pick up a transmission, "I'd have some kind of hydro to make a few waves with." We knew just what he had in mind. Perhaps one with a little flavor of the 16-foot outboard he did a 180-degree loop with at the Lake Havasu races when he got a little too much air under the bow at 80 mph.

The subject changed. "We could have done a lot better at Bonneville. Smokey had two 3-mile straightaways and two 2-mile turns and there's not as much tire drag or scrub. You can really fly down those straightaways." Craig had a point. In Texas he didn't want to risk high-speed blowouts with no crash rail, so the tires had to have inner liners. But Goodyear doesn't make inner liners for the super-narrow-tread-Bonneville-record skins, so maxi-width sticky 10.25 x 15 Trans-Am tires had to be used, and despite high inflation pressures they looked like big black chunks of almost congealed rubber cement. They even increased the frontal area of the car a little bit.

"Because of the altitude at Bonneville you have a little trouble with carburetor jetting but the air is also thinner and I think the lower drag more than makes up for the power loss." From this you get the idea that if American Motors ever tries a record session again it will be at Bonneville. "It's a good thing we had the inner liners," Craig breaks in. "Lee had a flat at 153 when the movie helicopter blew sharp stones on the course and she thought it (the car) just felt a little loose."

When we get out to the garage and the test track, we find the two AMXs in one corner being worked on by some of the same crew that broke the Land Speed Record: Paul Nicolini (crew chief), Wayne Ewing, Charlie Jackson and George Klass. Except for

Charlie Jackson we could be in a shop somewhere in the San Fernando Valley.

American Motors' advertising wedge is that these cars are stock — at least stock-bodied — though it is hard to tell if the proportions have been violated because of the red, white and blue vertical paneled paint jobs. The cars are not as radical as Grand Nationals, closer to the Trans-Am Javelins that American Motors will campaign this season. "We just completely blueprinted the car," Craig said. "It arrived on the 17th of December (1967) and we had six weeks to get it ready. Our cars were not lightened because we felt static weight would be better than a trunk spoiler and a shovel (front spoiler or airdam) like Smokey used. The test track is a 5-mile banked circle, and it seemed at the speeds we were going that the centrifugal force would keep us pretty much glued in.

"It's just a neat package. The car is built so well. You know, when I first started hot rodding I had a '34 Ford 3-window Ford coupe and that's what the AMX reminds me of. The car handles real well — no bump-steer and there's good roll stiffness," Craig added in a final burst of brand enthusiasm.

As a point of fact, those good old American engines were helped along about as much as Smokey Yunick's Chevrolets were. The only requirements the car really has to meet are that it be closed, have the correct number of cubic inches and retain near production dimensions. For everything else, if it has a part number, it's legal. Breedlove just flat didn't have the time to customize his AMX much, but since Smokey ran at the flats with the same car SCCA rejected for 21 infractions at the Riverside Trans-Am, you get some idea how liberal things may get in the record business.

Smokey of course built his own powerplants whereas Traco manicured the ones for the Breedlove blast. The engine foundry at American Motors

A behind-the-scenes look at how Craig Breedlove, his wife Lee and companion Ron Dykes took all those international kilometer records away from Chevrolet. Soon to be playing at a theater or drive-in near you.



Craig, his wife, Lee, and Ron Dykes played musical cars, hopping from one to the other, but still triumphed.

by Eric Dahlquist

RECORD AMERICAN BLAST

never had it so good. First off, there were two engines, a 304 CID bored 290 for Class C and a 397, 390 for class B. Both had Aviaid 8-quart, trap-door, windage-trayed oil pans and Belanger headers (32-inch leads, 1 3/4-inch in diameter with 3 inch diameter collectors, 4-feet long). Pistons were Forged True with Dykes-type rings and a Schiefer clutch-flywheel assembly whirled on the end of a fully balanced, radiused, shotpeened crankshaft.

We never did discover what kind of camshaft was used but an American Motors-hired photographer snapped a shot of the M/T aluminum rocker arms—a frame that was later mysteriously censored out of the contact proof sheets we received. Somebody would have probably preferred not to have us know how much horsepower Traco got out of these units either, but since an automotive paper had already published 374 hp (@6800 rpm) for the 304, and 443 (@5800 rpm) for the 397, there was no real point. We'd have been proud—even with an Edelbrock R4B medium high-riser manifold and 681 Holley, that's pretty respectable output.

Making the movie seemed more hassle than breaking the records. There is no great trick to driving around this course except that you must be in excellent physical condition because it wears away on your stamina like a fine abrasive. Even with the last-minute, crash-building program Craig and Ron Dykes had been prepared, and about the only thing that threw the show out of kilter was that the oil pressure suddenly went away and then, later, the alternator.

"When I ran with Carroll Shelby up on the Salt two years ago, his Cobra only used a quart of oil in 12 hours. The AMX had the oil-cooler and the deep-sump pan totaling 10-12 quarts and I just didn't see how we could have run out. At about the 11th hour (of the 24 hours) Ron was driving and just happened to look at the gauge when the needle fluttered and dropped, so he cut the engine and coasted in. We weren't expecting anything like this and only had two quarts of oil warmed and ready to go in. There was a real panic for a few minutes when it didn't even register on the dip stick and no more oil was

right around. I called Jim Travers (Traco, Travers & Coons) the next morning and he said, 'Oh, yeah, I meant to tell you about the rings—they're the same kind we use in the Trans-Am cars and they use a lot of oil.'"

The alternator was another deal. Somewhere a short developed in the system and there wasn't time to find it. So, backyard engineering triumphed. They just switched batteries every three or four laps, quick-charging the replacements in the meantime. Of course, this took 27 or 28 pit stops. But what the heck, it worked didn't it? They got the record, and now if someone does rebreak it and AM wants it back, they'll know where to trim about a good 15 minutes right off the bat. We missed all this and not the filming. Joe Petralli and his USAC timers didn't, but they're pretty blasé about the record business anyway.

Through the whole episode Lee Breedlove, Craig's wife, listened and worked and drove and didn't say much. She's quite attractive, you know—fine, chiseled features, long black hair and—we'd judge—a volatile personality under the placid veneer. The husband-wife bit makes good copy for all the adventure-starved broads across America. Everything gets old, though—this not quite as fast as the dumb suburban housewife gambit but the luster wears off when you watch the time go down the drain...safely through another wasted day. All the period we are there, Lee's car, the Class B AMX, is waiting for its engine to be put back in. Or is it Craig's car? It is really getting confusing because an old sign painter has been changing the names and the numbers back and forth for the movie people, at least twice a day.

Late Thursday afternoon, Feb. 8, the 304 engine blows when Craig goes for a couple of short records he didn't get the first time. It wasn't a bad engine; it had lasted over 4000 miles and that must be some kind of record for such a powerplant. Craig mentions it in the motel that night. He does not have the boyish glow of 1964 when he and Art Arfons were playing tag with each other setting and rebreaking the World Land Speed Record as if it were some trophy dash. The talk turns to jets. "When thrust meets

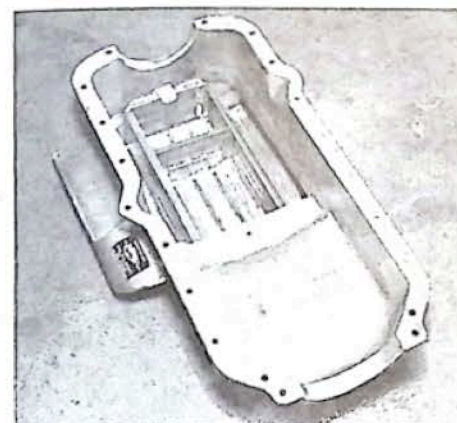
drag," he says, "you stop accelerating like you ran into a wall. I felt it in both my cars." And he's doing all this gesturing with his hands showing where the thrust and drag curves meet.

"I don't think a turbine engine belongs with a piston engine at Indy. If it is allowed to run (in other words, if Granatelli should win his suit) there are a lot of other space-age,

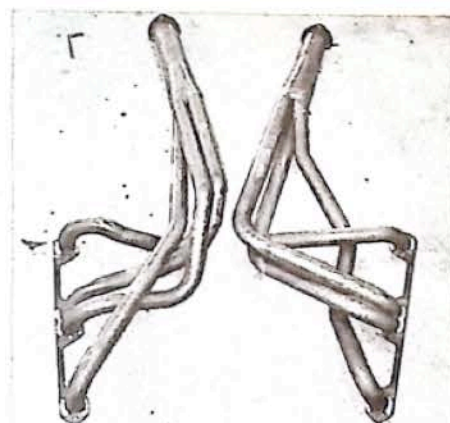
'science' powerplants being developed that put out way more horsepower and USAC will be in trouble."

You have not noticed it before because of the noise and confusion but now, in the quiet of the motel room as Craig sits expostulating on turbine engines, the next Land Speed Record car and his plans for Indy—oh yes, he's got plans for Indianapolis—you notice he speaks in kind of a nasal

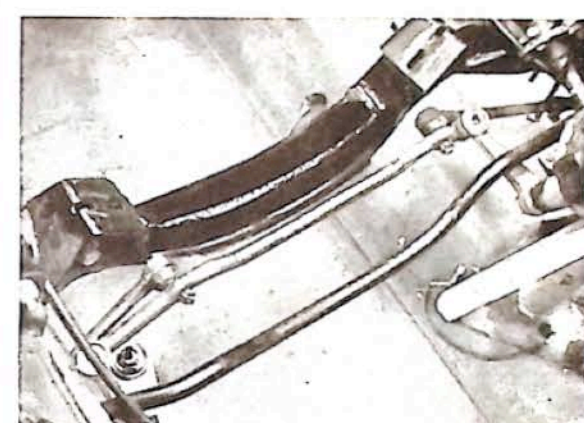
monotone with an adolescent-like determination that all things are possible if only you have faith. His credo is the credo of the American dream: work hard, persevere and you will overcome. Craig Breedlove is a classic example of his own, the nation's own, philosophy. Horatio Alger in a firesuit. Perhaps some day a psychology professor will come and take a picture of him. /MT



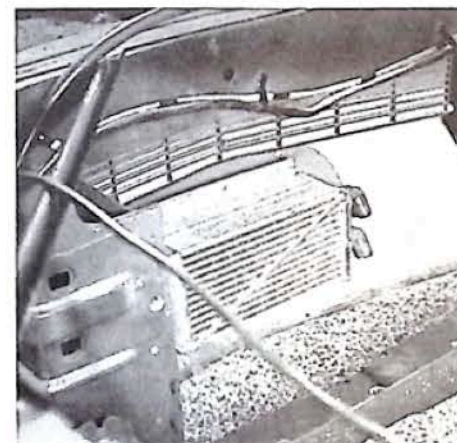
That's an Aviaid oil pan, sport. Everybody's got 'em these days because they keep the oil from sloshing away from the pickup, right?



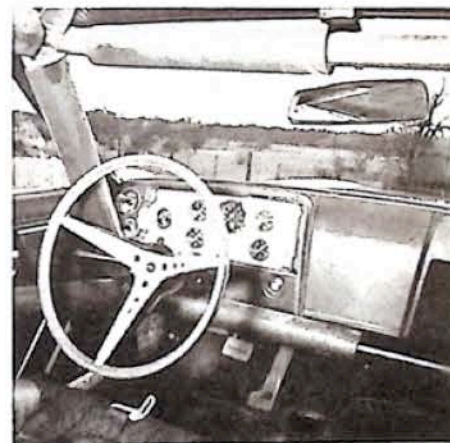
These aren't exactly what you'd call stock headers but it's okay for breaking international records. Belanger made this setup.



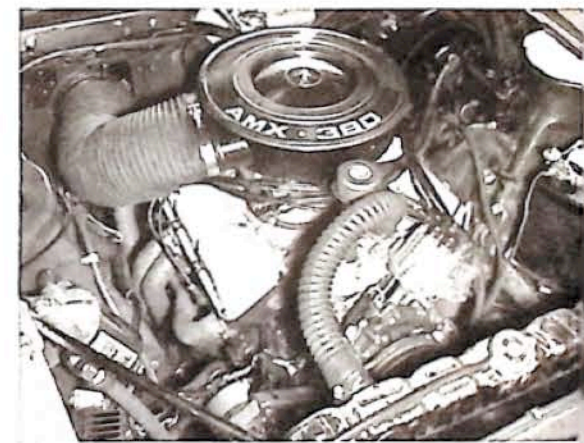
Front crossmember of AMX was notched slightly to allow easier removal of oil sump. Fat anti-sway bar is another reason car handles.



Extended high-speed running of AMX demanded oil cooler to keep temperature in prescribed zone. Cooler is aluminum cored.



Boy, just look at all those gauges; that's what Stewart-Warner likes to see. Co-driver Ron Dykes kept his eyes glued to dash.



390 American engine was really 397 Traco built for the project. Both car and powerplant follow theme of Trans-Am program.

CLOSED SEDAN RECORDS CLASS B

Distance	STANDING		FLYING	
	(old) MPH	(new) MPH	(old) MPH	(new) MPH
200M	171.690	---	172.160	174.295
75M	171.273	173.004	173.989	---
100M	171.273	173.004	173.989	---
1000K	148.702	156.548	148.738	156.708

CLOSED SEDAN RECORDS CLASS C

Distance	STANDING		FLYING	
	(old) MPH	(new) MPH	(old) MPH	(new) MPH
25K	149.564	152.192	152.708	158.556
25M	150.664	154.799	152.554	158.730
50K	150.939	155.464	152.592	157.917
75K	151.600	155.529	152.535	157.499
50M	151.720	155.669	152.439	157.536
100K	151.618	155.967	152.105	157.438
75M	151.307	156.314	151.460	157.609
100M	150.747	156.993	150.766	158.006
200K	150.007	157.547	149.685	158.265
250K	149.453	153.355	149.651	154.191
300K	146.030	150.146	146.096	151.051

Distance	STANDING		FLYING	
	(old) MPH	(new) MPH	(old) MPH	(new) MPH
200M	146.220	150.439	146.086	150.420
250M	146.002	151.233	145.931	151.742
400K	146.002	151.212	145.931	151.724
300M	145.987	151.907	145.924	152.340
300K	145.979	152.030	145.920	152.456
500K	144.925	150.996	144.890	151.313
400M	145.125	151.754	145.092	151.996
500M	144.788	150.675	144.767	150.853
1000K	144.449	149.928	144.437	150.038
2000K	143.837	149.392	143.825	149.481
3000K	---	144.971	102.840	145.025
2000M	---	144.711	102.800	144.669
4000K	---	142.635	102.310	142.385
3000M	---	140.184	101.800	140.214
5000K	---	140.543	101.720	140.576
1HR	149.453	153.342	149.569	154.187
3HR	145.009	151.482	144.967	151.764
6HR	144.692	149.687	144.672	149.808
12HR	143.676	146.044	143.664	146.047
24HR	---	140.757	102.310	140.790

K=kilometer M=mile HR=hour



MOTOR TREND/MAY 1968 77

Beyond the credibility gap Craig Breedlove roars to erase all those records set by Yunick.

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LOSER OF THE YEAR

continued from page 51

kudos he justly deserved. And both Jim Hurtubise and Bobby Unser claim that as far back as 1964, Granatelli showed them drawings of the STP-Paxton Turbocar at his home.

At 9:15 p.m., Basil Bacon, STP's director of marketing, broke in. He was going home. "Short day today, huh, Basil?" mused Dave Blackmer, PR director. But for Basil, too, it was a normal day. Granatelli's associates are also dedicated, though as much out of devotion to The Chief as to their job.

Dolly, well-known as a superb cook, disappeared into the huge adjacent kitchen, complete with ice machine, refrigerator, sink, stacks of cupboards—fully stocked with liquor and food and an electronic oven. She collects cookbooks—has over 150—and she reads them... thoroughly. In 120 seconds she reappeared carrying a tray of hot melted cheese and cracker hors d'oeuvres and a bowl of Pretz-L-Nuggets dipped in Avec mustard—her own simple, intelligent innovation. She refilled the family-sized drinks and her husband's tension subsided noticeably. It was that intuition of hers again.

It was much later and the calls were coming over the fantastic switchboard and two private lines by his desk at longer and longer intervals. Still, he answered them.

"Andy, why don't you ignore USAC and create your own turbine racing association?" I asked.

His answer indicated how personal his involvement was. "Because then I wouldn't be competing against the guys I want to beat."

But when you reflect on the traditional logic USAC has used, you wonder why he bothers with them at all. From Henry Banks, USAC's Director of Competition, come statements like, "Our board has taken the position that this car (STP-Paxton Turbocar) has too great an advantage, power-and-torque-wise, so that it therefore does not meet the rules."

Granatelli wants to compete under these stipulations, but is it right to make him suppress his own capabilities?

In response to queries like, "Do you think, then, you'll have increased the competitiveness by restricting the size (of turbines only)?" Banks replies, "Yes, very definitely. I believe that American ingenuity will step forth and meet the challenge and come back with cars that will be competitive." If USAC is so "constructive" in stimulating challenging development of turbines to match performance of larger piston engines, where is the stimulating developmental challenge for piston engines supposed to be?

continued on page 82

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PORSCHE GOES AUTOMATIC? WHAT HAVE THEY DONE?!!

What they have done — if you are to believe Porsche press releases and brochures — is to be convinced that "some (our emphasis, not theirs) sports car owners wanted the optional convenience of shift-free driving..." and since Porsche was "never satisfied with those (automatic transmissions) previously in use..." they decided to develop their own system.

The "system," as such, is not a true automatic transmission, but rather an "automatic clutch" that transmits engine power through a torque converter to a standard gearbox. Shifting is accomplished by the movement of the floor-mounted gear selector, without benefit of a clutch pedal. When the gear stick is moved, a vacuum cylinder forces disengagement of the single-plate dry clutch and re-engages the next gear according to where the stick was moved.

Externally, the only difference you'll note in the new body (which we happen to like better than the previous, somewhat dumpy design), is in the "Sportomatic" emblem on the rear decklid. You will see this only on 911 models, since the automatic is available only with 6-cylinder models. The other — and major — differences lie in how the car feels.

Since there is no clutch pedal — and for a while you're at a loss as to where to place your left foot — it took a number of days of fairly steady driving to get used to that idea. The gearshift is on the floor where it's always been, but there are some strange markings on the knob. This doesn't faze you, though, because as you thrash the stick around you find the usual locations for 1st through 4th and reverse. It's when you switch on the key and drop it into gear that you notice the difference.

First of all, the engine won't turn over in any gear; you have to be in neutral or P (which actuates an internal lock for the rear axle, keeping the car in a parked position). With all 148 horses throbbing away in a healthy sounding 2-Weber-carbed, 6-cylinder engine, you can start off in any gear, but your rate of

acceleration is dependent upon which gear you select.

If you're making a transition from a standard 4-speed car, you'll probably start in L and go through the other three gears, D, D-3 and D-4, as if they were 1st, 2nd, 3rd and 4th. In actuality, according to Porsche, L is only for "ascending or descending steep grades, or for driving on sand or ice," though you can get up to 52 mph at 6400 rpm. D is for city traffic and on our test car allowed a speed of 73 mph at 6400 rpm. D-4 is the top gear and is for highway cruising, while D-3 provides an accelerating or decelerating gear. Top speed in D-3 is nearly 100 mph at the 7000 rpm redline.

Going through the gears feels pretty much like it does with a standard gearbox Porsche, but there's lots more wing flapping before take-off. You also don't (cannot) shift the way you do with a standard Porsche. Once in gear, you have to keep your hand off the lever until you're ready to shift to the next gear; any pressure on the lever automatically throws you into neutral. (During a shifting sequence, this might only be embarrassing; in a cornering situation where your knee strikes the lever and "neutralizes" it, it is more than embarrassing.)

The speed with which you take off depends on the gears you use, with the quickest by far being to use L to start, shifting at around 52 mph to D, at 73 to D-3, and (if you've got the place to do it) at 96 mph to D-4. Using this method, you'll get to 60 mph in 10.7 seconds and do the quarter-mile in 17.7 seconds with a speed of 77 mph.

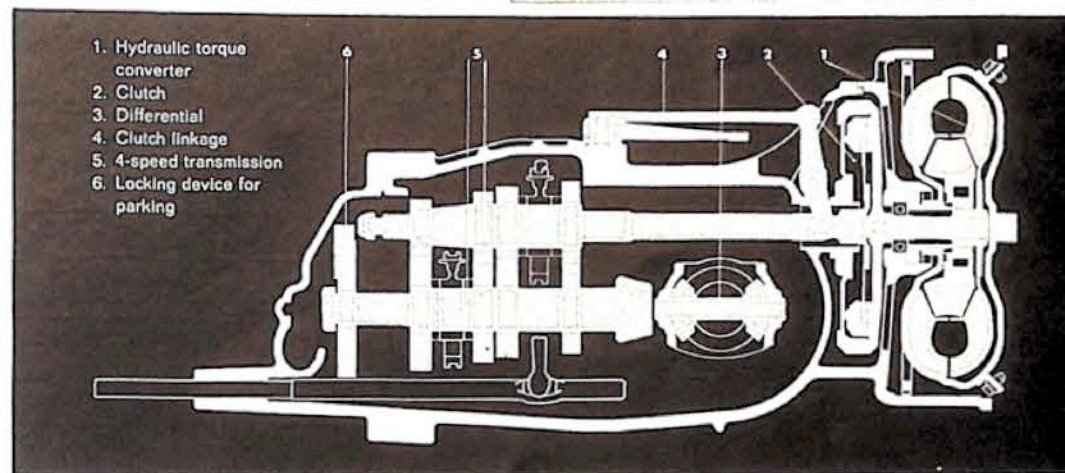
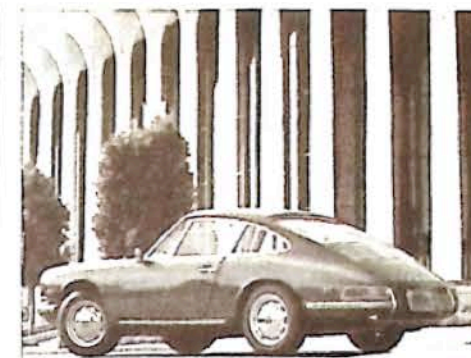
The differences in using the other gears to start are not only noticeable if you're timing yourself, but even if you're not. In D-3, for example, you mash the throttle and for a while you seem to sit there motionless. The engine speed immediately goes to 2600 rpm, is maintained there until your speedometer indicates about 30, then increases normally as it would with full throttle pressure. In both D and D-4, it's similar, though a bit faster in D and a bit more prolonged in D-4 — the engine

PERFORMANCE (2 ABOARD)					
Acceleration	L	L-D	D	D-3	D-4
0-30 mph	4.3	—	—	—	—
0-45 mph	6.8	—	—	—	—
0-60 mph	—	10.7	13.3	16.1	19.7
Standing Start 1/4-Mile:	77 mph (using L, D, and D-3)				17.7 secs.
Passing Speeds:					
40-60 mph					7.5
50-70 mph					8.9
Speeds in Gear:					
L					52 @ 6400 rpm
D					73 @ 6400 rpm
D-3					96 @ 6400 rpm
D-4					—
Mileage Range					14.7-20.9 mpg
Average Mileage					17.6 mpg

SPECIFICATIONS
 Engine: Rear-mounted, air cooled, 6-cylinder horizontally opposed. Bore & Stroke: 3.15 x 2.60 in. Displacement: 121.5 cu. in. HP: 148 @ 6100 rpm. Torque: 140 lbs.-ft. @ 4300 rpm. Compression Ratio: 9.0:1. Carburetion: 2 triple-throat Webers. Transmission: 4-speed torque converter. Final Drive Ratio: 4.428:1. Steering: Rack & pinion. Turning Diameter: 33.8 ft. curb-to-curb, 2 3/4 turns, lock-to-lock. Tires: Pirelli Cinturato 165 x 15. Brakes: 4-wheel hydraulic discs, dual system, 9.25 in. front, 9.57 in. rear. Suspension: Front: independent with suspension struts and transverse arms; torsion bars. Rear: independent with trailing arms, torsion bars. Body/Frame: Unit construction. Dimensions, Weights, Capacities: Overall length: 163.90 in. Overall width: 63.39 in. Overall height: 51.97 in. Wheelbase: 87.05 in. Front track: 52.64 in. Rear track: 51.85 in. Road clearance: 5.90 in. Curb weight: 2370 lbs. Oil capacity: 9.5 quarts. Fuel capacity: 16.4 gals. Cooling system: air cooled.

OPTIONS & PRICES
 No options. Price: \$6710.00. West Coast POE.

It feels more unreal than it actually is. Though engine power is put through a torque converter, then into a standard gearbox, the only apparent difference between Sportomatic and automatic is the movement of a shift lever.



rpm holding at 2600 rpm until about 37 mph. The differences in time taken to reach 60 mph almost doubles when using D-4 instead of L and D (see table).

We'll agree with Porsche that the Sportomatic is easier to shift than a standard gearbox, because you can stay in any one of the forward gears according to driving conditions, never shifting until you stop, reverse, or park. But... do Porschephiles resent shifting? It is convenient not to shift after prolonged clutching and de-clutching in traffic, but it's doubtful if an enthusiast could get used to the "wing flapping." And doesn't it take some of the pleasure out of driving such a superb car as the Porsche? The thrill of putting together just the right combination of engine speed, throttle pressure and clutch action to effect the "perfect" shift? It would seem that Porsche would have been the last of those to succumb to Progress. A Corvette with automatic, sure. Even Jaguar. But Porsche?

With a Porsche you have a "oneness" with a car that is seldom achieved. It's not long after you've been behind the wheel that you feel you've been driving it forever. The seat-to-wheel relationship is absolute epitome. And comfortable! Short trips, long trips, no kind of trip will tire you.

You drive a Porsche differently from a conventional car, mainly because of the engine location, but once you realize that when you're beyond the point of adhesion the front end is going to mush out — which is where you lose control — everything is fine. When this happens, you steer into the drift and back off on the throttle to avoid having the back end come around.

This combination of ride and handling is one that's hard to imagine if you've never driven a Porsche. Every enthusiast owes it to himself to drive one. But, fair warning: you'll probably come back wanting to throw rocks at your own car, whatever it is. And the next time an engineer tells us that you cannot combine a good ride without sacrificing roadholding, we're going to tell him

to "Get lost!" To get lost in a Porsche, that is, for a few hours on a rough-surfaced, winding road. This 911 takes known dips and rough spots better than most so-called good-riding cars and its cornering ability is hardly without peer.

Braking is another fine feature of the Porsche. When you want to stop, you step on the pedal — not hard, but firmly. You'll stop surely, safely and in a straight line. You'll wince at an occasional squeak from the pads (and more often if you install the optional, harder, competition pads), but that's little enough annoyance to pay for such outstanding brakes.

What else is good about a Porsche? How about inside releases for the luggage lid, the deck (engine) lid and the gas filler neck? A pull of a knob sure saves a pant leg from getting dirty or you from getting a skinned knuckle. Then there's an honest-to-gosh tool kit — filled with wrenches, screwdrivers, pliers, a spare V-belt, fuses, etc. — a towing hook on the body's underside to permit proper towing, if needed; a fuse box out in plain sight for easy fuse replacement; a legible, well-laid-out instrument panel.

What's bad about a Porsche? Gas economy with the Sportomatic. You come to expect good mileage from a Porsche, but it's logical to assume that with 2 Weber carbs pumping gas into 6 cylinders and driving them through a torque converter (with a slippage of 3.5%), that you're not going to get as good mileage as you would from the 4-cylinder engine and stick shift.

There's not much else to fault. An awkward inside door release that's operated by a small pushbutton in the forward side of the armrest. (It's tolerable for a man, tough on a woman.) The price, for another, which puts it out of the reach of too many people. Yet, Porsche's production facilities are such that they will undoubtedly continue to try to catch up with their demand. And along the way, they'll probably even sell a few with Sportomatic. An enviable position.

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LOSER OF THE YEAR

continued from page 78

Was much of the dissent because of lack of noise in the turbine? If so, Granatelli says he is willing to supply any noise the spectators want. "If they want the noise of Novis, I'll give it to them. If they want 'em to play music, so be it..."

1967 was the first year that the SAE honored anyone from the racing industry, and Andy Granatelli was the honoree. It was only one of several accomplishments. At age 13, he and his two brothers, Joe (16) and Vince (9), drove from Dallas to Chicago, alone, in a 1932 Olds sedan; he became a millionaire soon after his 30th birthday; together with his brothers he set 400 new records at Bonneville Salt Flats; STP-Paxton's fine film, "Silent Screamer," sailed through the first round of the Academy Awards. His latest tribulations suddenly seemed very unjust.

Granatelli grabbed his homework—seven briefcases—and the party repaired to The Embers, a local eatery heretofore untried by The Chief. We were taking a chance, but it seemed appropriate under the circumstances. It paid off, and that seemed typical.

The Embers' dim lights and Granatelli's absence from his normal habitat combined to soothe him slightly, and he probably started right then to plan his assault on Indy, '68, with Colin Chapman, Jim Clark, Graham Hill and Parnelli Jones in an STP-Paxton-Team Lotus effort that would sweep the socks off the die-hards. Perhaps even then he could see that the \$6000 for entry fees of his six brand-new turbine-engined cars would be well spent. He might also have been visualizing production of some kind of turbine car for regular-kind people because, says The Man, "In 10 years the piston engine will be obsolete."

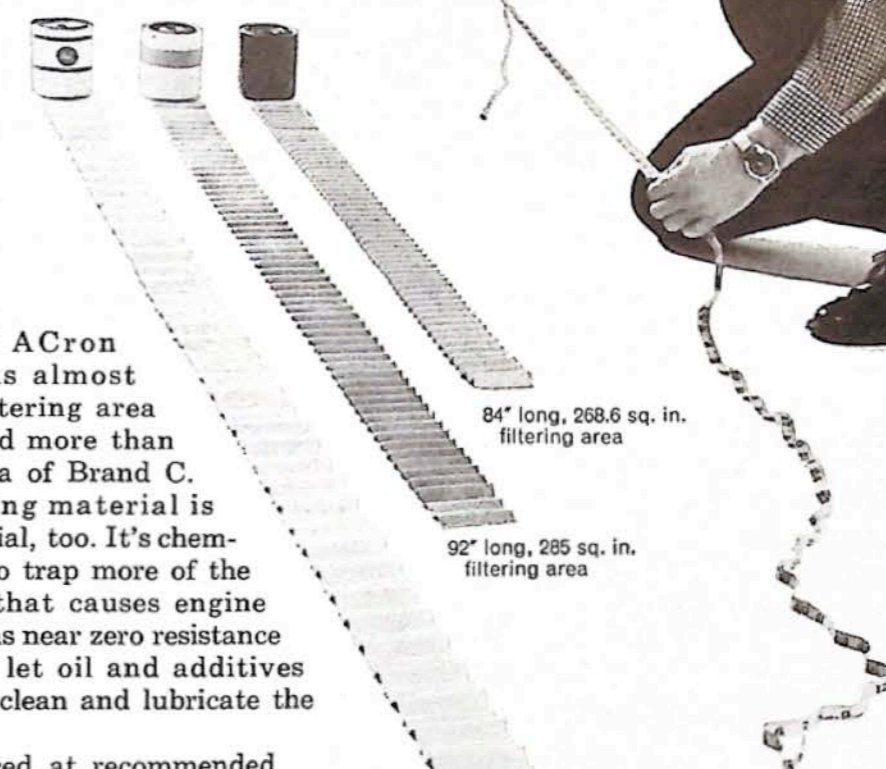
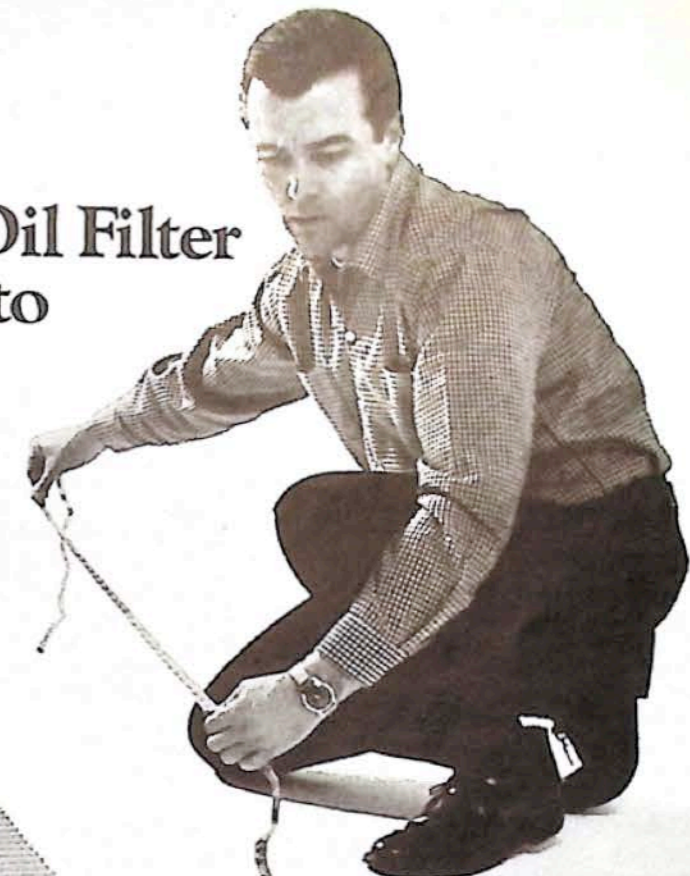
"When will it all be over, Andy?" I asked, about all his current troubles.

Still the same old dum-dum, I hadn't realized until too late what I had done. His dreams faded quickly and The Man bowed his head, his face displaying remembrances of 20 years of friends who were no longer friends, of spirited competitors who were now only frightened manipulators. Dolly had the diagnosis, "What has hurt Andy so much is that friends have turned against him." It was as though he just discovered that his glorious history had never occurred. He was a man who had devoted his life and his millions to a labor of love, only to be rejected by that love.

Anthony Granatelli was miles... years away by now and when he spoke it was very soft.

"It will never be over... never..." /MT

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AC SPARK PLUG DIVISION

For Safety's Sake, Check Your Lights—Replace with AC Guide Lamps.



159" long, 540 sq. in. filtering area

TURBOCAR

continued from page 54

3. Granatelli went to Bendix to try to get them to reset the fuel flow control to provide more power, but Bendix said they couldn't do that without asking United Aircraft first. And Andy knew U.A. wouldn't approve.

4. The engine's built-in overspeed protector worked perfectly during the several driveline failures. It shut fuel off so fast that the driver couldn't detect the slightest initial rise in engine speed.

5. Starting on lap 178 Andy showed Parnelli the "save fuel" sign to slow him down, not because there was any fuel problem but because he didn't want Jones to lap Foyt—an event that could have had unpredictable consequences. Actually slowing the Turbocar would have used more fuel, as Andy well knew, due to the turbine's fuel consumption characteristics.

6. The cracking of an inner bearing race that retired the car was an absolutely random failure, with no sign of high temperatures or lack of lubrication. But a fatigue failure might have been hastened by the two starts and the 64 laps run under the yellow flag, when the turbine was running in its high-torque speed range.

7. Checks at the end showed the tires would have been good for 4300 miles and the brakes for 1470 miles of racing. During the entire month the turbine used only a half-quart of oil—against the 150 to 200 gallons that Andy's Novis used to consume.

8. In the race Jones had an advantage of 1 to 2 mph over his competition, "about the same margin I had with my roadster in 1962 and 1963. So help me God," Parnelli swore, "I did not sandbag the entire month of May. I drove it as hard as I would any car."

9. Andy Granatelli allotted the credit for the car's performance this way: 30% to the engine's torque characteristics; 40% to the 4-wheel drive, and 30% to the driver and the weight distribution.

10. The Turbocar had exceptional luck with the weather, with temperatures of 59 degrees and 68 degrees F. on the two race days. A 90-degree day could have erased its lap speed margin.

For Granatelli the immediate post-Indy scene was one of victory in defeat, of vindication of a dream, of recognition granted that had been long withheld. The engineering and construction of his car was widely and freely praised. Plans were made for Studebaker to make a miniscule return to the car business by building 20 Turbocars to

retail for some \$68,000 each. Aware of the threat of a limitation on his engine by the capricious USAC board, Granatelli pleaded, with reason: "Add 15% to our weight, allow more pit stops at Indy, check our power before the race and keep a man with me to see that I don't cheat—I'll even pay his salary and expenses for the month of May. But please don't chop down our inlet size."

In an apparent outburst of wisdom, the USAC Rules Committee decided on June 8 to refer the question of a turbine limit to a committee of industry experts. The outburst was more apparent than real, because by USAC custom the previously-declared limits should have been left alone for at least two years. But with kangaroo-court speed the experts were individually consulted by the Committee, headed by Henry Banks, which recommended that turbines be required to run on methanol, that (in curious contradiction) water/alcohol injection be banned, and that "a 25% reduction in inlet annulus area . . . be considered."

On June 26 USAC issued its final ruling, cutting annulus size of all turbines to 15 square inches, a reduction of 35% from the former limit for axial-flow turbines. Conveniently forgotten by the Board was its former more generous limit for centrifugal-inlet com-

pressors. The water/alcohol injection was banned on the remark of a GM engineer that its use could increase power by up to 25%, even though the same engineer noted that it would have to be injected at a rate of three gallons per minute for the ST6B-62 turbine. The car would have to have a 200+ gallon tank for the water/alcohol mix alone! And if the requirement to use alcohol fuel had been adopted it would have doubled the turbine's basic fuel consumption rate.

In promulgating their precious inlet-annulus formula, USAC ignored an excellent turbine formula developed after long study in 1964 by Britons Peter Spear and Noel Penny, later adopted for international racing. After exhaustive analysis they decided a relationship based on the compressor pressure ratio and the area of the internal turbine nozzles gave the best comparison to the piston engine. They studied a formula of the USAC type, but discarded it because it was a significantly less reliable guide to the turbine's probable output. And why did USAC, almost peremptorily, dismiss the idea of the Spear-Penny formula for Indy? Because, they said, it would take too long to take the engine apart to check the nozzle size. It would take a couple of days, they said. Funny that they didn't consider that even if that

were true, it would effectively prevent a competitor from taking his engine apart during May to make some sort of internal change after it had been initially USAC-approved at the factory. Besides which it's almost impossible to change, in the field, the parameters of the Spear-Penny formula anyway. Maybe USAC thinks there are really little pistons in there somewhere.

How did the ST6B-62 turbine rate on the Spear-Penny-F.I.A. scale? On the basis of gasoline fuel, for which the formula was planned, it is equivalent to 303 cubic inches (5040cc), the Indy stock-block limit, as it happens. On an alcohol-fuel basis it is equal to a 260-cu.-in. (4260cc) piston engine, as close as makes no difference to the present Indy unblown limit. And if alcohol with 10% nitromethane were considered, a mixture many use for the race, the equivalency would be 240 cubic inches (3940cc).

After the axe fell Granatelli did consider the idea of a Novi engine in the car, and he also made a trip to Italy to talk to Ferrari about an engine. But then he realized: "That's just what USAC wants me to do. I'm not going to step backward for them. And I've been spoiled by these turbines. I don't ever want to pull a spark plug again." He also realized there would be no point in building a new car, at colossal

cost, for the smaller inlet limit. "If I did and it was a good one, they'd only change the limit again." And he's right. That's why the matter went to the courts, hopefully for a judgment during March.

What's really needed at this point is a limit on the piston engines. If they were prevented from using nitromethane, or if they had to qualify on the same fuel they use in the race, which is only reasonable, then some turbines might be able to make the starting field. Even with the smaller annulus a turbine might do well in the race but it could never qualify.

There's another angle too. The turbine uses its air supply for both cooling and combustion, supplementing its cooling needs with an external oil radiator. Why not ration equally the amount of air that both types of engines, pistons and turbines, may use for both purposes? Why should the piston engine's air inlet be free while the turbine's is restricted? That's probably more than USAC is able to grasp, however. Meanwhile Granatelli is getting ready to stir up trouble in new fields. He's "doing more than just thinking" about building a turbine car for the current Grand Prix Formula 1. Is the Grand Prix circuit ready for Granatelli? When the STP pajamas appear at Monaco, we'll know. /MT

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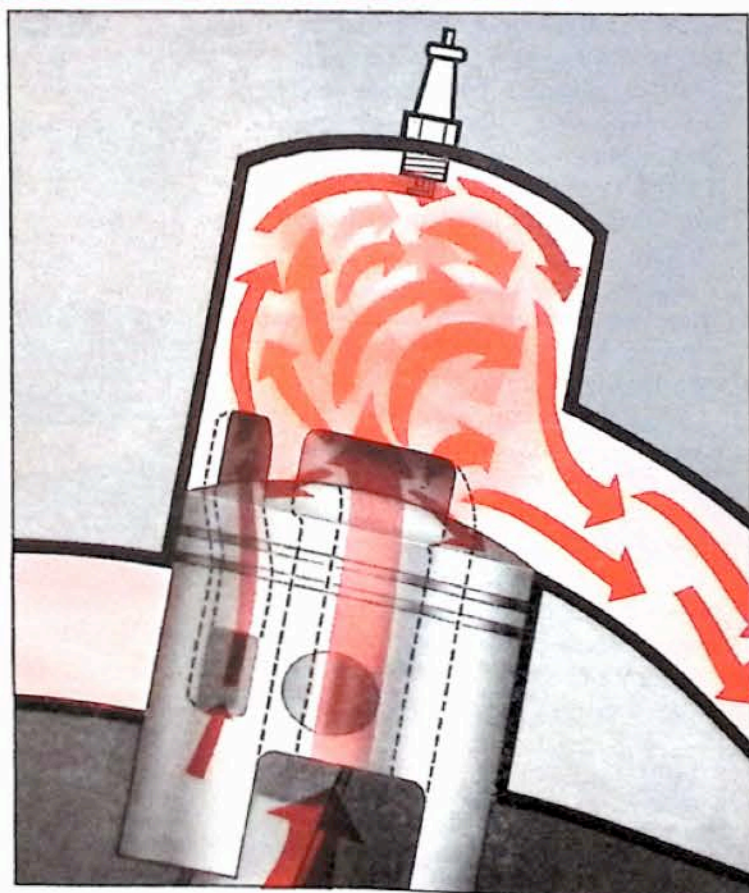
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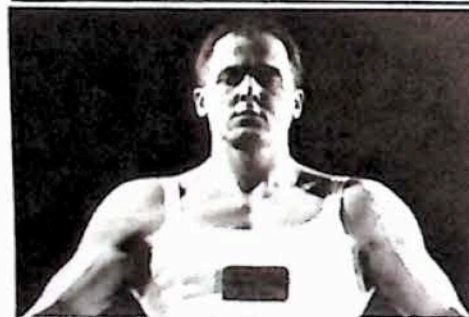
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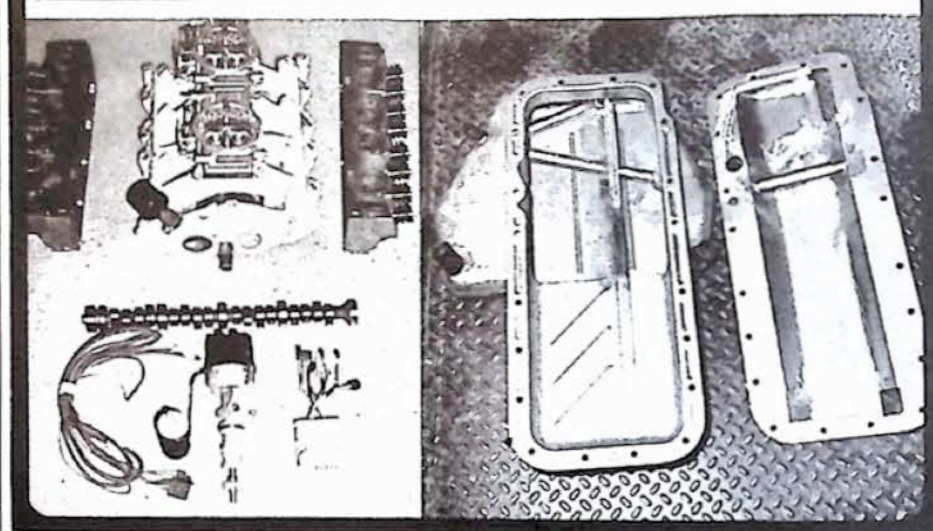



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DAYTONA *continued*



(Top) Wood Brothers did not win in a breeze having to swap not only tires but ignition as well. (Above) Ford's real trick this year was a superior car design but they did a few things to the engine too—carbs, manifold, heads, valves, cam and ignition. You know, just little stuff. (Above Right) Chrysler had divided oil pan.

fore? Part 1 can be answered in the words of Mario Andretti. "Well, they only pay \$200 per day for tire testing so there's no reason to break your neck or the car." Part 2 demands a little more attention, since it was a combination of ingredients, mostly the luck of the draw. Detroit automotive stylists do not design with NASCAR superspeedway racing as a primary goal. Most of the time it's not even secondary. But, for whatever reason, the '68 Torino and Montego fastbacks were right on in the air-flow department. To underscore how small details can have major consequences in aerodynamics, the slightly different Montego front fender assembly, swapped to the Torino, was 1 1/2 mph better. When Ford engineers discovered this, the place was suddenly crawling with Mercs.

Since a 1-mph increase on the straightaway equates with a 15-hp increase—and in the turns this leaps to 25 hp—you knew that most of the Ford gain was registered in better car shape. Yet the tunnel-port 427 did get some refining. Like now some call it

the "Stage IV version." The new cam was a bit longer than before and consequently the engine produced such dragster-like characteristics as hard starting and occasional long tongues of flame from the exhaust. Intake valve size was only fractionally larger than last year's 2.190-inch, but the approach angle was different. The manifold side of the port was no longer a true circle being flattened at the bottom. Each and every port was individually air-flowed and a pair of 780 CFM Holley carbs were added, which had had their rate cut to 752 CFM by using four (each) truck booster venturiis (PN 45149). Again, in order to match individual cylinder needs, the boosters were notched to direct the fuel as best as possible into the air stream. Imported from the French expeditions of the last three years was a Le Mans live-forever, transistorized ignition that reportedly was worth \$800 per copy due to the amount of testing that went into it. In the end the new stuff was the best of all possible worlds—more power and better gas mileage.

continued

People write to



Have a question about motor oil? Lubricants? Engines? Ask the Pennzoil experts...

Hot Time In The Old Car. The engine in our '59 car has been overheating recently. I've checked the thermostat, radiator, hoses, softplugs, head gaskets and just about everything under the sun. Now it's your turn!

T.P.N., Fillmore, Calif.

Overheating in an older engine is often due to hard water deposits formed in the cooling system of the block. Since you've checked all other points, we suggest that the system be flushed. It won't always be satisfactory, but it's worth a try. Get a good, reliable mechanic to do it for you.

Darker Quicker. I've noticed that Pennzoil Z-7 seems to turn darker more quickly than some other brands. Is that good or bad?

N.A., Dallas, Tex.

Good. Pennzoil Z-7 is an active detergent oil. The fact that it turns darker more readily than other oils indicates that the additives are doing the job for which they are intended.



Oil Sniffer. I've used Pennzoil 10W-30 oil for many years and have always found it to be top quality. Recently I noticed that the smell of it has changed. Now don't laugh, because it gave me the idea for this question. Have the additives in Pennzoil been changed in the last couple of years?

D.T.D., Winston Salem, N.C.

We're not laughing. The odor of the oil might change slightly since we are continually improving our products, including selection of the best additives for our particular base oil. The odor, however, has no bearing on the quality of the oil.

Trailer Talk. I use Pennzoil SAE 20 in my 1963 Ford Country Squire. I plan to start pulling a 17 foot travel trailer and wonder if I can get by with the oil I'm using, or should I go to a heavier weight oil? Also, if I did start using a heavier oil, could I change back to my regular grade when not pulling the trailer?

J.J.J., San Jose, Calif.

For extra protection, we suggest the use of Pennzoil Z-7 SAE 30 when pulling your trailer. There will be no problem in changing back to Z-7 SAE 20 later on, and no increased oil consumption should result.



To Add Or Not To Add. Time and time again, you've stressed "do not overfill." I keep coming up against the following situation: the dipstick tells me I need a little oil, yet a quart will be too much! Why don't you make Pennzoil in pints?

H.L.A., Springfield, Ill.

Automotive manufacturers build a safety factor into the crankcase which prevents running too low on oil level. In other words, when the oil reaches the "add oil" line on the dipstick, one quart will bring it up to the "full" mark. Yet when the level is at the "add oil" mark, the level is not so low that mechanical damage will occur. This is the safety factor... and the reason that pints of oil are not really necessary.

Do It Yourself. According to the owner's manual, I should use an SAE 20 oil in my 1966 Volvo when the temperature is between 32 and 90 degrees; and an SAE 30 oil at 90 and above. Around here, the temperature can range from 50 to 95 degrees in 24 hours! That makes 20W oil too light part of the

time and SAE 30 oil too heavy part of the time. Suppose I mix 20 and 30 oil in equal parts. Wouldn't that be the answer? Does oil mix properly this way?

E.W.R., Burbank, Calif.

You'd have no problem in mixing SAE 20 and SAE 30 oil to get an in-between grade. The same brand and type should be used, however, to keep the additives from being mixed and to keep the detergent level the same. Actually, in your area, you could use Pennzoil Z-7 SAE 30 in summer and SAE 20 during the winter. The SAE 30 would give better protection than mixing SAE 20 with 30.

Smoke! Rings? I change the oil in my '65 Comet Caliente every 2,000 miles. But every time I start the car, or after it has been idling for awhile, it will blow out a blue cloud of smoke. What is my problem... rings, valves or what?

J.L.M., Johnstown, Colo.

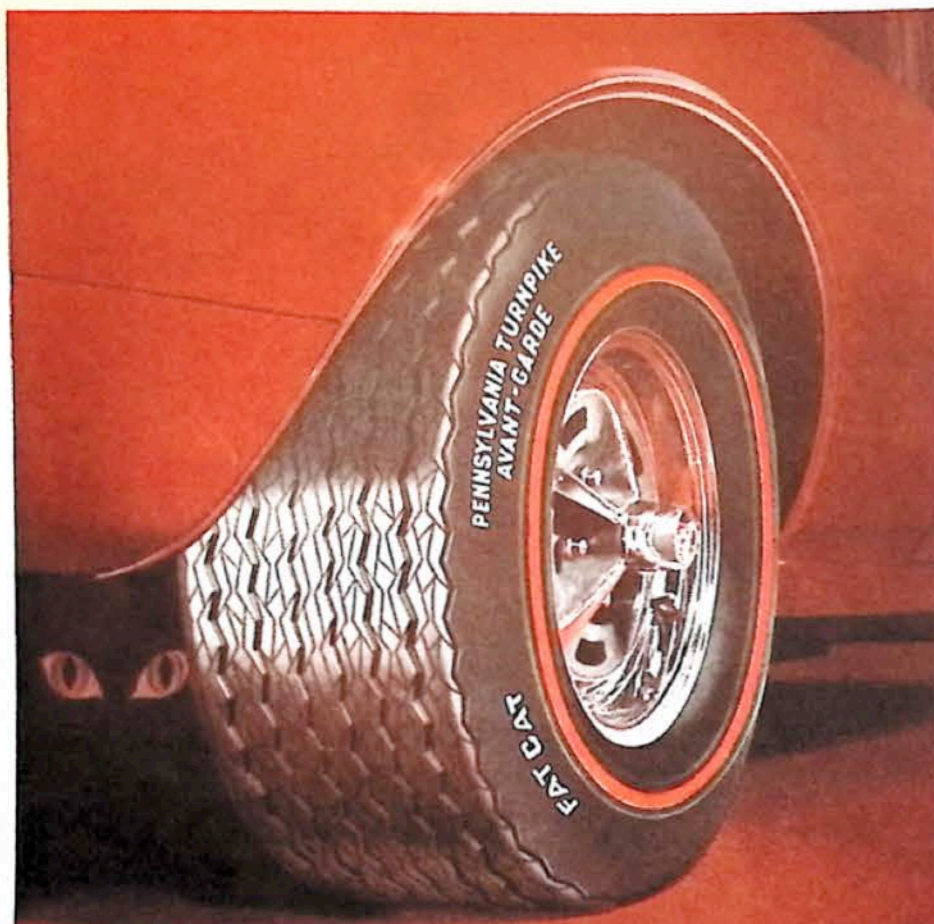
If you don't have an oil consumption problem, don't worry about some smoking out of the exhaust after idling. Under idle conditions, more oil is drawn into the combustion chamber. Upon acceleration, it is burned, causing exhaust smoke.

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DAYTONA *continued*

Chrysler too had pinned most of their hopes on improved aerodynamics but unfortunately for them, underestimated the speed required to be competitive — by a mere 6 mph. Except for Richard (Petty). The Charger's coke-bottle shape, which only a half year ago had looked promising, trapped too much air in its deeply recessed grille and would not go much above 183. Neither would the Plymouths. Except Richard. Amazingly enough the Plymouth Road Runner by Petty qualified on the outside pole at 189.055 mph, equal to the Fords and clearly 6 mph better than any other MoPar. Why? Since the cars are stock it must have all been a matter of fine tuning, right? Perhaps.

For openers, try the slickest body you ever saw, all painted, polished and detailed out in the Petty garage in Randleman, N.C. On a sort of giant barbecue spit for the cars the body was manicured at a ratio of about two hours for the top and four for the bottom until it was done to a turn. Other refinements were incorporated too. The thunderous hemi engine built by the master, Maurice Petty, was lower, more rearward and offset to the left more than any that had ever been designed at the factory. Wind, that devil of a speeding car, was denied entry at every possible place, in fact, quite a few more places than anyone else was allowed. Because all the factory cars of both camps were running at Bonneville velocity, they sported Bonneville rakes with nose down, tail up. Only Petty's car did not look quite right from the profile, appearing as conversation went in the pits "like a long, blue banana." It was really quite a challenge to learn this much because the top of the car sported a black paint job for the first time in its life and the crew literally kept the machine under wraps when it wasn't actually moving.

What it looked like was that the Pettys had assumed Smokey Yunick's role of a year ago. A bargain appeared to have been struck where a few options would be allowed the famous No. 43 so there would be a show. Chrysler had been pleading all along to Bill France for an extra carburetor to equalize the advantage Ford enjoyed with their "accessory" tunnel-port conversion. The consequences of France's refusal only became clear after the first practice session when all the MoPars, even Petty, were 4 to 6 mph off the pace. This would never do. Who would come to see the Fords run against one another? Smokey's scale model Chevrolet was a possibility but his driver, Gordon Johncock, hadn't just won his second Grand National Championship. Besides there had been quite a bit of furor over him last year. *continued*

How Renault scrimps on gas without scrimping on car.

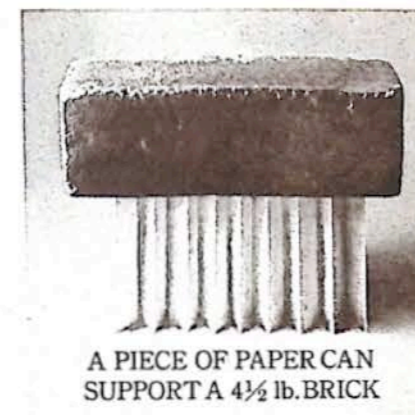
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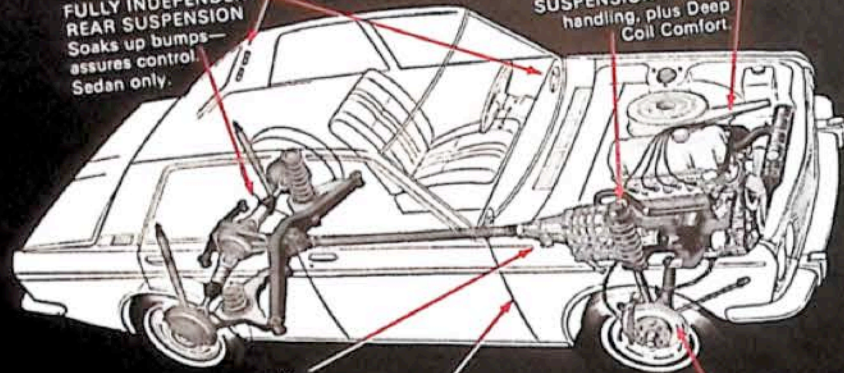
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DAYTONA *continued*

And what of Smokey and the "best dammed garage in town"? Oh sure, he showed up at the track all right with one of the zoomiest creations ever wrought by the hand of man, but it did not pass tech inspection. The committee went over the vehicle with a fine-tooth comb and found nine things wrong with it. While they were checking the gas tank capacity and all the fuel was drained out, he said, "Aw, the hell with it," climbed into the car, fired it up and drove it out of the track! "There really wasn't much more wrong with it than there was last year when his '66 qualified on the pole," one famous tuner observed idly as he recounted the situation.

The two 125-mile qualifying races on Friday would tell the story. Everybody said that and everybody waited and, of course, it rained on Friday. There had only been one good day the whole week and this was the icing on the cake. Now the people would have to go out Sunday and play it by ear. Bill France did not write off the situation so easily. After all, he had a bunch of spectators up there in the stands who came to see two 125-milers. So what if the track was wet — dry it off. Even though the rain had stopped, the drivers were of another mind than racing in the wet at 185 mph. "Tell 'em to get in their cars," ordered France. The idea was to run 10 dry-off laps and then start the race. But the drivers didn't buy it. After a strung-out procession which slithered all over the place and seemed continually on the verge of a devastating pileup, the start-the-race-at-any-price-because-it's-going-to-cost-us-money insanity ended, at least for the moment. When the cars came into their stalls a queer thing happened: all the factory Fords began yanking out their powerplants while the Chrysler contingency stood around. Hulking Bill France entered the garage and told the Ford mechanics to stop. People talked in hushed tones. You could feel the tension, an expected thunderclap confrontation. Ford officials huddled with France and everything went back to the way it had been. By 4:30 when there was no hope, the races were officially scrubbed and the latest episode in Americans for democratic action came to an end.

Not since the first one back in 1958 had a Daytona 500 started with so many unknowns. Would the tires last? What would 3, 4, or 5-car drafting produce? Could you pass in the turns? Would the Ford engines stand the pace? Chrysler's only hope was that they wouldn't, that Richard Petty could do the job all alone. We did not have long to wait to find out. *continued*

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