

COMPARISON TEST:

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MOTOR TREND

€ 50¢ DECEMBER 1968

UK 4/3 Sweden KR. 3.95 Inkl. oms

PERSONALITY:

PONTIAC'S JOHN DeLOREAN

NEW YORK'S JEROME AVENUE—
EAST'S USED CAR EXCHANGE

ARE TRANSVERSE
ENGINES PRACTICAL?

IMPORT TEST:

AUSTIN AMERICA



**CRAIG BREEDLOVE'S RECORD-SEEKING AMX—
A NEW TREND IN
DEALER CUSTOMIZING**



We, the Pontiac Motor Division of General Motors Corporation, do hereby reaffirm our faith in the principles of law and order. And as testament to our respect for said principles do hereby issue the following public appeal . . .



ENGINE

Cylinders	.....8
Bore and stroke	.....4.12 x 3.75
Displacement	.....400
Compression ratio	.....10.75:1
Horsepower	.....366 @ 5100
Torque	.....445 @ 3600
Valves: Intake	.....2.11 in.
Exhaust	.....1.77 in.
Camshaft:	
Lift (Man. Trans.)	... .413 intake, .413 exhaust
Duration	
(Man. Trans.)	... .301° intake, 313° exhaust
Lift (Auto. Trans.)	... .414 intake, .413 exhaust
Duration	
(Auto. Trans.)	... .288° intake, 302° exhaust
Carburetion	.....1 4-bbl. Quadra-jet
Exhaust system	.....Dual w/low-restriction muffler

DIFFERENTIAL

Ratio3.55:1
-------	-------------

BRAKES

Type	.....Drum, front & rear
Dimensions:	
Front diam.	.....9.5 in.
Swept area	.....269.2 sq. in.
Rear diam.	.....9.5 in.
Swept area	.....269.2 sq. in.

SUSPENSION

Front	.....Heavy-duty coil
Rear	.....Heavy-duty coil
Stabilizer	.....1.00-in. diameter
Tires	.....G78-14
Rims	.....6-in. wide
Steering gear:	
Type	.....Recirculating ball bearing
Ratio	.....24:1
Turning circle	.....37.4 ft.
Turns of steering wheel, lock to lock	.....5.6

TRANSMISSION

Type:	.....3-speed manual
Ratios: 1st	.....2.42:1
2nd	.....1.61:1
3rd	.....1.00:1

DIMENSIONS

Wheelbase	.....112 in.
Front track	.....60 in.
Rear track	.....60 in.
Overall height	.....52.3 in.
Overall width	.....75.8 in.
Overall length	.....201.5 in.
Shipping weight	.....3506 lbs.
Test weight, pre-production car	.....N.A.
Crankcase capacity	......5 qts.
Cooling system	.....17.8 qts.
Fuel tank	.....21.5 gals.

The Judge. From Pontiac. Looking every inch like older brother Billy.

A new name. With a special brand of justice to discourage the so-called, performance-minded competition.

Like a standard, 366-horse, 400-cubic-inch V-8 with Ram Air and a 4-barrel. Or maybe the 370-horse, 400-cubic-inch Ram Air IV V-8, if you so order. Either way those hood scoops function.

Like a fully synchronized, floor-mounted 3-speed cogbox. A close-ratio 4-speed with Hurst shifter (yea!) and a 3-speed Turbo Hydra-matic (boo!) are also in the hopper, if you'd care to order same.

Like a 60" spoiler, blackened grille, exposed headlamps, Polyglas belted tires (big and black), a screaming red-orange finish with a white paint slash, steel mag-type wheels and "Judge" I.D. inside and out.

Like an Endura schnoz that regards chips, dings and scrapes as acts of treason.

Like Morrokide-covered buckets. And a no-nonsense instrument panel that fills you in. And keeps you that way.

When you're ready to buy, tell your Pontiac dealer to order you a hood-mounted tach, a rally gauge cluster, power front disc brakes and variable-ratio power steering.

And with that, our case rests.

It's justice, man. Justice.

The Judge will hold court at your local authorized Pontiac dealer's beginning in January.

The Judge: a special GTO by Pontiac



4 color pictures, specs, book jackets and decals are yours for 30¢ (50¢ outside U.S.A.). Write to: '69 Wide-Tracks, P.O. Box 888A, 196 Wide-Track Blvd., Pontiac, Mich. 48056.



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Two renditions by artist Bill Moore of Craig Breedlove's record-seeking AMX, which Moore also helped design.

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FRAM FILTERS TALKS TO THE EXPERTS



Driving flat out, every time, is for the "Heroes." It's not the way you win championships.



The team of Mark Donohue and Roger Penske typifies the new breed of road racers. Both men take their work very seriously. Car preparation is as important as racing strategy. They think in terms of winning Series, not just individual races.

Fram visited Mark and Roger at their garage in Newtown Square, Penna. The building reflects their concern with professionalism: It's spotlessly clean, well-lit and manned by a team of white-clad Expert Mechanics who quietly and expertly go about their work. We talked to Mark and Roger about Sebring preparation:

FRAM: Mark, let's talk about Sebring for a moment. Is there anything unique in what you did to prepare the Camaro for this race? In other words, how essential is pre-race preparation as compared to pre-Series set-up?

MARK: Well, a lot of people think that preparing for a long distance race and a sprint are two entirely different things. We don't think so around here. There's only one way to prepare a car and that's perfectly.

At the actual race, pit crew performance, car preparation and driving become equally important.

FRAM: Mark, how about some comments on YOUR driving philosophy?

MARK: Both Roger and I feel almost the same about driving philosophy. What I try to do is finish the race and do as well as can be expected. Basically, if you start out to finish the race, you're going to be a lot better off in the long run than if you just go out there to win, drive as hard as you can and hope for the breaks. Driving flat out, every time, is for the 'Heroes'. It's not the thing that wins championships.

But this doesn't mean I don't drive with everything I've got. If at the end of the race I feel I could drive one more lap, I haven't put out as much as I should.

ROGER: Yes, I'm very happy with Mark's driving. But, we never run these races any faster than we have to; fast enough to win is just fine. We're not out to break records just for the sake of breaking records.

This way, the chances of Mark getting hurt are minimized and the equipment lasts a lot longer.



We're in the racing business based on our performance. That's what wins championships. Racing is expensive—we'll give up a little showmanship to be right up there at the end of the season.

FRAM: That covers it pretty well... just one more thing. By just looking around the garage it's easy to see that both of you are very interested in cleanliness. Your cars, the engines, the whole place is spotless. From this, we'd be willing to bet you're equally interested in internal cleanliness, too?

ROGER: It's a lot more than just being interested. Internal cleanliness is a must. That's why we use products like Fram High Performance filters. We've learned that we can depend on Fram to keep the inside of the engine as clean as we try to keep the outside.

MARK: We've been using Fram filters for years. In our minds, we've shown that they're simply better than other types of filters for our purposes. The housing withstands racing-type oil pressures. And its combination of low restriction and high filtration make Fram head-and-shoulders above the rest.



Fram Performance-Proven Filters. They work on the track. They work on the road.

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PUBLISHER'S PAGE by Ray Brock

There has been much talk of late about new, exotic powerplants that are going to obsolete the internal combustion reciprocating engine used to propel most of the world's automobiles. Judging from stories that have been released by some of the nation's respected newspapers and business magazines, the steam engine is almost ready to puff back on the scene in modern glory and new-found efficiency. Right behind that are a couple of sealed-gas heat engines more or less among the same theme as the system used to freeze ice cubes in your refrigerator. And, of course, everybody knows that the electric car will solve all our smog problems and it's just around the corner.

Being a magazine devoted to the rise and fall of the automotive empire, MOTOR TREND has been keeping its eyes and ears open so we can be the first to announce the one (or more) breakthrough that will revolutionize our industry. We've tried to follow up each news story and often have been at least partially successful. We have seen machinery supposed to deliver amazing power from very small packages but unfortunately, usually get there just in time to learn that, "we're making some slight changes and won't have it back together for a while yet, but we'll let you know when you can drive it."

We've adopted a wait-and-see attitude on most of the homebuilt miracle engines but we also recognize that there are some reputable companies very much involved in trying to come up with THE powerplant of the future. Our editors have been gathering material from a variety of sources and next month we are going to feature findings we've come up with to date.

The cover will picture Autolite's "Lead Wedge," an experimental car designed to set a land speed record for electric cars. Now this is really a tongue-in-cheek car and it's designed strictly as a publicity vehicle for Autolite batteries for even though Autolite is a division of Ford Motor Company, Ford advance planning engineers have their own thoughts about the electric car in our future.

Preliminary discussions with some of Detroit's better qualified engineers have disclosed that they, as a group, don't see the steam engine posing a great threat to the internal combustion engine at the present time—or even in the foreseeable future. And how about the much-publicized Wankel engine that was supposed to put that clumsy

American V-8 out of business? Well, it seems as though the Wankel, although in production in both Europe and Japan, has more problems meeting air pollution (smog) minimums than our present engines so will not be a threat to take over soon.

You will note that in the interview of John DeLorean, Pontiac's General Manager (page 30), he states that he considers turbines the logical powerplants for our future automobiles, not steam or electricity. Now John is a very sharp engineer and is obviously privy to experiments and opinions within General Motors' secret laboratories, so maybe this is something to keep in mind.

Remember those 50 experimental turbine-powered cars that Chrysler built and loaned out to selected drivers a few years ago? Well, we know they learned a lot from those cars and whereas they were powered by Chrysler's Stage Four turbines, there are some modified production cars running around today conducting tests with Stage Six turbines. Chrysler is obviously convinced they have an idea worth pursuing. GM and Ford are publicly limiting their turbine development to large truck powerplants but who knows what's taking place in the back rooms?

We remember a dinner conversation with a vice president of engineering for one of the major manufacturers a couple of years ago where he stated that the internal combustion engine used to power our automobiles is still far from obsolete. When questioned as to how it could continue to meet minimum air pollution standards year after year when it was obvious these standards would continue to be lowered, he stated that it could be done but that each step would cost additional money. In other words, whereas most of the current crop of cars meet requirements by closely controlled carburetor calibrations and distributor timing, the next drop in pollution minimums might require the addition of an exhaust manifold air pump, too. After that, perhaps a pre-heater for the intake charge, then maybe an exhaust afterburner, and perhaps some type of filtration of the exhaust gases.

The big question is, just where is the crossover point? When do the costs of the present engine with additional anti-smog extras become larger than a turbine engine? Or maybe a steam engine made of anti-corrosive stainless steel? Or an electric car powered by revolutionary exotic-metal batteries? Or somethin'?

Check in next month to see what our intrepid explorers of the automotive future have in store. I have an idea it's going to be a gas.

/MT



1969 Mustangs shatter 295 speed and endurance records.

All-new Mustang runs 24 hours nonstop at 157.663 m.p.h.

No American production car has ever gone so far so fast. In a single 24-hour run—the engine never stopped turning—the specially prepared and modified canary yellow 1969 Mustang SportsRoof screamed its way around the rutted 10-mile course at an average of 157.663 miles per hour. Driven by professional record-breaker Mickey Thompson and co-driver Danny Ongais, the sleek new Mustang, powered by a 302-cubic inch Ford V-8, went a distance of 3,783 miles in the 24 hours. Thompson's average speed was 17 miles per hour faster and the distance driven was 405 miles farther than the previous record. In the 24-hour period the yellow 1969 Mustang set over 100 American stock car records in the Class "C" Division for engines between 183 and 304 cubic inches as prescribed by the United States Auto Club. In another specially prepared 1969 Mustang SportsRoof, Thompson went on to break all standing and flying start records from 25 to 500 miles in Class B (305 to 488 cubic inch displacement). All these records make an undeniable statement about the new 1969 Mustang . . . never before has any car combined the performance to go so fast and the durability to do it for so long. What this means to you: The 1969 Mustangs are winners—at the track or on the turnpikes. See them in your Ford Dealer's Performance Corner.

NEW MUSTANG RECORDS

(Partial listing)

Class B (305 to 488 cu. in. displacement)
Flying Start—25, 50, 75, 100, 200, 250, 300, 400 and 500 kilometers
Flying Start—25, 50, 75, 100, 200, 250, 300, 400 and 500 miles
Standing Start—25, 50, 75, 100, 200, 250, 300, 400 and 500 kilometers
Standing Start—25, 50, 75, 100, 200, 250, 300, 400 and 500 miles

Class C (183 to 305 cu. in. displacement)
Flying Start—25, 50, 75, 100, 200, 250, 300, 400, 500, 1000, 2000, 3000, 4000, 5000 kilometers
Flying Start—25, 50, 75, 100, 200, 250, 300, 400, 500, 1000, 2000, 3000, 4000 miles
Standing Start—25, 50, 75, 100, 200, 250, 300, 400, 500, 1000, 2000, 3000, 4000, 5000 kilometers
Standing Start—25, 50, 75, 100, 200, 250, 300, 400, 500, 1000, 2000, 3000, 4000 miles
Flying Start—1-hour, 3-hour, 6-hour and 24-hour endurance
Standing Start—1-hour, 3-hour, 6-hour and 24-hour endurance



All data certified by U.S. Auto Club

MUSTANG



The place you've got to go to see what's going on—your Ford Dealer!

Viewpoint

by Leo Levine



We are in a lot of trouble. Read books like "The Naked Ape" and "The Territorial Imperative." Then take a look at the census bureau forecasts for the next 200 years, and at the megopolis between Washington and Boston, or the one between New York and Chicago.

After that view the congestion at the nation's major airports, at the rigor mortis afflicting the railroads, and at the inadequacy of the nation's road system despite the interstate highway network.

Today's aircraft have a scarcity of adequate landing fields near major metropolitan areas. The trains barely run any more, and Detroit keeps spewing another 9 million vehicles per year onto the overcrowded highways. And more and more people are being born.

We are strangling ourselves.

No, not you — I know you live in North Platte, Nebraska, and it's not very crowded there yet, and besides, by the time we reach the Ultimate Impasse, you'll be dead and buried. But it's going to make a big difference to your children. Just as the country feeds the city, the city supplies the country — and when you can't get from one to the other, it's not going to count for much if you still find a parking space on Main Street in North Platte.

So here we are, all of us busy propagating children and building rocket ships to send Wally Schirra and Buck Rogers to the moon. In the meantime it is becoming nearly impossible to get your wife to the hospital or to drive through rush-hour traffic to the launching pad.

Where did it all start? With Adam and Eve, naturally, who were too busy thinking about that damn apple to worry about more practical things. But if that goes too far back for you, another good point might be that day at Promontory, Utah, in 1869, when California Governor Leland Stanford was to drive the golden spike that signified completion of the first trans-continental rail line. Stanford swung — and

missed. Someone should have gotten the message.

But back then it was a big country, and one in which laissez-faire was the established practice. Nobody ever heard of automobiles, as everyone was busy building railroads. The Federal government neither knew nor cared what was going on, and at one time in the 1870s approximately 200 railroads were under construction at the same time. Many of them ran parallel to each other, but that didn't seem to make any difference. Jay Gould would boost the stock on Wall Street and everyone would make money — they thought.

Today there is scarcely a town that doesn't have a set of rusted tracks running past a dilapidated, unused station. At the same time there are planners who estimate that in the foreseeable future, the southern approaches to New York City will require an additional 40 lanes of highway. They don't say if they expect them all to flow into the already overcrowded Lincoln and Holland tunnels and over the George Washington Bridge.

And in the other corner is a study which shows that a single track of railroad has the same hourly passenger capacity as 24 lanes of expressway auto traffic. But do you think the railroad man and the highway engineer are going to get together? They might, and that's one of the few hopes we have.

Although the creation of the cabinet post is perhaps 100 years too late, we finally have a Department of Transportation. So at least it is a start in the right direction, even though the present state of government is such that red tape will probably cost more than the highways or airports.

Then there are such organizations as the New York Metropolitan Transportation Authority, MTA for short and sometimes sarcastically known as "The Wholly Ronan Empire" after Dr. William J. Ronan, who is chairman of the authority and the second-highest paid public servant in the U.S. (The President gets \$100,000; Ronan and Austin

Tobin, chairman of the Port of New York Authority, each gets \$70,000.)

Ronan's is perhaps the biggest headache in the entire nation. He's got control of the Long Island Railroad, a commuter line which went broke and which the city took over; all tunnels and bridges, and all general aviation facilities serving private planes and non-scheduled airlines. The areas in which the MTA does not have direct control include New York's biggest airports (Kennedy, LaGuardia and Newark), which are the province of the Port of New York Authority, and the highways, which belong to the state's Department of Transportation.

So there are still three agencies that must be consulted just to attempt a straightening out of New York City's problems. Even if they get along with each other, and even if the inevitable politics do not enter into it, think of the communications involved. (For the moment, Ronan doesn't have any money worries; New York has floated a \$2.5 billion — that's right, billion — bond issue, the largest ever for transportation improvement.) But even that is not much. A billion of it is ticketed for subways alone.

In the meantime Tobin is vainly trying to find a place to build a fourth jetport to relieve New York's air congestion. Even if they started digging tomorrow, it would be seven to nine years before the first plane took off from a new terminal. Some of those circling the city now might just have to stay aloft until then.

And Detroit keeps on blissfully spitting 9 million cars a year into the already sluggish stream. How long is it going to be before the stream becomes so clogged workers can't get down it to the place where they build the cars to clog it some more?

Several months ago Brock Yates, who works for a magazine whose name escapes me for the moment, did an excellent piece on what he called "Detroit Myopia." He made one mistake. He should have added astigmatism. /MT

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Don Garlits carries the Wynn's name on the side of his dragster because he knows Wynn's Charge! works. It provides the full compression, maintains the total power he needs to cover a 1/4 mile in record time. If it didn't — it wouldn't be in the crankcase of his Wynn's

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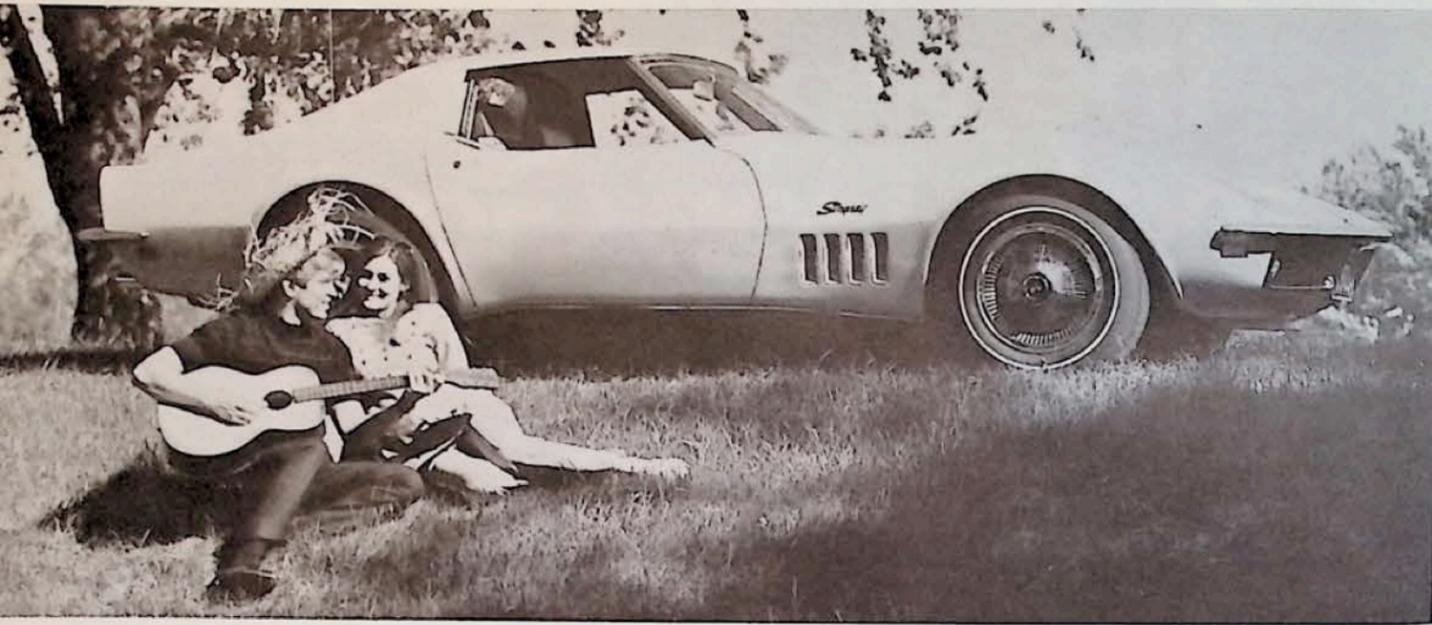
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Don Garlits and his Wynn's Charge! Record holding NHRA Top Fuel Eliminator.

Inside Detroit

Chevy has 'Vette with a \$3000 engine option



There's something happening here. What it is isn't exactly clear — because that looks just about like a stock old '69 Sting Ray up there in the grass. But, it could be the hottest thing since the Chicago fire — Chevrolet's answer to Ferrari; the biggest hair in a hairy world. A \$9000 Corvette. A \$6000 body with a \$3000 engine option. Which could only mean, if you read the September issue of Motor Trend, the all-aluminum 427. It didn't take them long to get it into a production car did it? As you might expect, though, at nine grand a crack, quantities will tend to be quite limited. Which in this case is a blessing because the en-

gines will be individually assembled and run in before the car ever gets to the dealer, constituting about as close a blueprint job as you are likely to get from the showroom. The specter of a 620-hp 427 'Vette weighing less than a 327 will blow the mind of every competitor in the entire world. Performance should be in the magnitude of a scaled-down McLaren M8A. Zero to 60s in the 5-second range; standing quarter-miles in the 11-second, 130 mph bracket with the simple addition of slicks; top speed, to be used somewhere in the troposphere or maybe even Le Mans. Even for Chevrolet this has got to be pretty far along the road.

'70 Chrysler Sports Image

Chrysler is well along in tests of its new sporty cars for Dodge and Plymouth. The new shell, common to both cars, has been dubbed the "F Series E Body" by Chrysler engineers. The cars will show up as 1970 models. One will be a new model of the Plymouth Barracuda. The other — now being referred to as the Challenger — will be Dodge's answer to the Firebird and Cougar. Dodge may stay with the name Charger for the car, however. The name has a recognized performance image for Dodge, and there's precedent for such a move. Look at the Pontiac Grand Prix, now a separate line in 1969.

What's New For '70

More details are coming to light on the 1970 models. Besides being the Year of the Specialty Car — with major changes in the T-bird, Toronado, Riviera and others — there will also be some fresh styling for the intermediates. For example, the 1970 Ford Fairlane looks all new from the wheels up. It isn't, but it will rank as a major facelift. The new Fairlane has a V-shaped grille similar to some of the Chryslers in recent years with horizontally placed dual headlights. The individual lights in each pair are set a few inches apart. The Mercury Montego, using the same basic body shell, features a grille which peaks in the center

like a ship's bow. The car also has full width tail lights and concealed headlights and windshield wipers.

How Small Is Small?

Those "small" cars being heralded as coming from Ford and American Motors may be overrated. Admittedly, there will be significant changes from the present Falcon and Rambler models. But the differences won't be as much as people might think. Here are some comparisons (figures in inches):

Rambler	1970	1969
Length	179	181
Wheelbase	108	106
Falcon-X		
Length	176.0	184.3
Width	68.0	73.2
Height	51.9	54.4
Wheelbase	103.0	110.9
Front Seat:		
Headroom	37.6	38.8
Leg Room	41.5	42.5
Shoulder Room	54.7	58.0
Hip Room	53.1	59.5
Rear Seat:		
Headroom	37.1	37.3
Leg Room	35.9	33.8
Shoulder Room	54.7	56.7
Hip Room	53.1	58.3
Curb Weight	2500	2818

Some people speculate the new Ford car may be called the Colt or Maverick, but the Falcon name may be kept, too.

AMC "Smallest" Car

American Motors has a second small car project. It's based on the 97-inch wheelbase of its AMX sports car. This could mean a small car in the same size bracket as the Volkswagen, which is on a 96-inch wheelbase. The new AMC car cannot be ready before 1971 or 1972.

Winter Tires Popular

Winter tires are getting more popular every year. Sales this year totaled about 17 million, up from the 16 million sold in 1967. Most, of course, are sold in the fall and early winter. About 30% of this year's batch of winter tires were fitted with studs, up from 25% last year. The reason for the increase in winter tires, particularly those with studs, is simple, according to Goodyear: "More drivers want to be better protected from winter highway hazards."

Automated Tires

Firestone says it's developed a process which automates tire building. It's called the Bead and Ply Assembly system. Firestone calls it the biggest advancement in tire manufacturing in 50 years. The first of the new machines will go into use early next year at the firm's Akron, Ohio, plant, although the move has stirred up protests among rubber workers.

Big Plans For Small Car

Ford may offer its new smaller car through Lincoln-Mercury as well as Ford Division dealers. The decision will depend on the car's expected production and sales volume. A high enough volume would make it possible to market the car through both divisions. The company hopes for 3% of the market and 300,000 sales and this might be high enough to let some L-M dealers have the car. It would probably help the division, which is aiming for 500,000 sales in the current year.

Electric Racer

A 200-mph electric car? A top electric engineer at General Motors predicts one could be built but it would be strictly a promotional stunt. "We could build one that could break some drag racing records," he says. This could be done with existing batteries. The technique would be a lightweight car and ultra-lightweight motors — the type used in torpedos. They can produce over 200 hp. Trouble is they don't last very long — about two minutes. This isn't as far out as it may sound. Ford's Autolite Division did pretty much the same thing — built an electric car with lead acid batteries and torpedo motors. The car was built to promote Autolite's new high-performance battery. The car's been dubbed the "Lead

Wedge," because of its shape and power source. It's designed to go over 100 mph.

Chrysler Rapped For Progress

Sometimes you can't win. Take Chrysler. First the company was criticized for deciding to wait until the Jan. 1 deadline before making headrests standard equipment. The company took it on the chin for following the law (some people thought the headrests should have been standard with the beginning of the 1969 model run). Well, wouldn't you know, Chrysler also ran into some problems for trying to do a little more than the law requires. The issue was over the Dodge Super-Lite (see Motor Trend, Sept. 1968), a special night driving light. Some states demanded samples of the light and test reports on its effectiveness before allowing it to be sold. Chrysler supplied the information, but under protest, claiming the states no longer have jurisdiction. It's Chrysler's position that the states' right to control over some items of automotive equipment, such as headlights and brakes, was pre-empted by passage of the federal safety law. Anyhow, the new light has a blue tint to it at certain distances. Some states raised the question of whether this could be confused with the blue lights on police vehicles. But it's doubtful this would happen, especially since police use flashing lights. In any event, the affair shows the need for uniform standards and one authority to write the regulations. After all, it took three years before all the states approved the 4-headlight system, now common on American cars. Under this timetable, the Super-Lite, which is going to be regarded as a significant safety improvement, would not have appeared before 1971. So, while there are still problems in a few states, it's obvious the federal safety standards are an improvement.

Turbine Buses

Turbine buses in 2½ years. That's the prediction of Chevrolet General Manager Pete Estes. General Motors' Detroit Diesel Division is known to have developed another experimental turbine bus and this could be the one. The timetable would fit in with other predictions about turbines in the early 1970s. Auto officials here are skeptical of the announcement by British Leyland Motors in London that it will begin selling a turbine truck next year. They find it hard to believe the British are ahead of them.

GM Tailgate Hangup

Oops! Wouldn't you know, after trailing Ford by three years in developing a 2-way station wagon tailgate, General Motors had trouble assembling the unit it finally developed for its

1969 models. It seems some workers weren't attaching the tailgates correctly during the first two months of the model run. The locking mechanism has to be synchronized so that the unit can be opened either as a door or a tailgate. If both sets of locks are open and someone turns the tailgate handle, the unit will slip off the hinges as far down as the bumper. This is what happened in 5% of the wagons inspected. GM hurriedly sent servicemen to dealerships to repair the faulty tailgates and issued some new instructions to assembly line workers. Things are okay now, GM says.

Man Replaces Machine

Anybody from Los Angeles would feel right at home in one corner of the General Motors Tech Center. This is a smog chamber 10 feet high and 10 feet in diameter. It's designed to duplicate the weather found at high noon, June 21, in Los Angeles. The chamber is lit with 247 neon bulbs. Nearby, a car is run on an engine dynamometer and a tube feeds the exhaust into the chamber. Sure enough, after the lights have been on awhile, smog forms in the chamber. Now some volunteers appear. They're summoned almost every day — from their regular jobs — and, for a 10-minute period, peer through holes into the smog chamber. They let the researchers know when their eyes feel irritated and how much irritation they experience at the end of the 10-minute test. The degree varies with the type of fuel and emission-control equipment used in the car. Volunteers are used because there's no machine capable of testing eye irritation, according to Dr. William Agnew, head of the fuels and lubricants department of the GM Research Laboratories. Already, the volunteers have helped identify a major property in the smog which causes eye irritation — something called peroxybenzyl nitrate, 200 times more potent than formaldehyde.

More Belt Changes

Look for more improvements in safety belt systems on cars. The first "integrated" seat and safety belt system is expected to be on some 1970 cars, probably those from General Motors. A couple of improvements were worth noting on the 1969 models. One is the self-locking mini-buckle lap belt which is standard on the Cadillac and optional on some other GM cars. It extends only so far as you need it, then locks, eliminating the necessity of different sized people adjusting the belt webbing. In addition, the Corvette now has inertia reels attached to the shoulder belts. They've been available before on European cars and on a few American specialty cars, such as the Shelby Cobra, but not on a car pro-

INSIDE DETROIT *continued*

duced by a major U.S. company. Chevy's Zora Arkus-Duntov believes the new system will increase shoulder belt usage because "you don't feel it when you're driving," yet it will lock a 0.3g load.

GM Smaller Car

Chevy's general manager, Pete Estes, has dropped another hint that General Motors has a small car in the works and that it may be out next year. He was asked whether, in view of Ford's small car project, Chevy would again trail, as the Camaro did the Mustang. "We aren't planning to be behind anymore, regardless," he said. "That 400,000 car catch-up on the Mustang was pretty rugged." It's a good bet that any small Chevy car will be a replacement for the Corvair, or at least give GM the excuse it needs for discontinuing the ill-fated rear-engine car. Estes says the car will be built next year, but wouldn't predict how long into the year it might go, or comment on whether there would be a 1970 model. Significantly, GM made no significant changes on the Corvair again for 1969.

Don't Fight City Hall

The next American president shouldn't tamper with the men in charge of the National Highway Safety Bureau. That's the view of Roy C. Haeusler, Chrysler's chief safety engineer who notes that Dr. William Haddon Jr., head of the safety bureau, could be replaced since he holds a presidential appointment. But, says Haeusler, "I hope very much the next president retains him. I certainly think

the job should be held very much on the basis of high technical competence." Other auto executives should be as willing to say what they think. After all, it's in their interest to see that the federal agency which writes auto safety standards remains in command of a man like Haddon.

Anti Anti-Skid

Chrysler has joined General Motors in questioning the reliability of anti-skid braking systems. Ford is offering the device on the Continental Mark III and shortly on the Thunderbird and insists its skid-control braking system built by Kelsey-Hayes is fail-safe. But Chrysler's top engineer, Syd Terry, says that with the 2-wheel anti-skid system like Ford's "you have no chance or very little chance of stopping as fast on dry pavement" as you would without the device. On the other hand, the car won't skid in stopping. The question seems to be whether one is a fair trade-off for the other. Ford claims stopping distance is about the same. In other words, Chrysler doesn't believe the system is ready for production.

Lear Steam

Guess who's getting into the auto business? William Lear. The firm he founded manufactures jet aircraft and other products. Lear says he's going to produce a steam car. He wants to build it at an old Air Force base near Reno, Nev. Lear hopes to have the first car ready for the road by the end of the year. The body will be no problem. He says he's going to buy them from the auto industry. He adds that his Leardyne steam car will cost about \$500 more than comparable gasoline engine vehicles. Washington's been

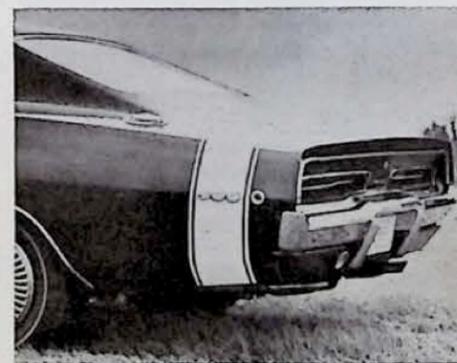
investigating steam cars lately. They've been suggested as a solution to the air pollution problem. Lear's betting this is the right approach and says he will invest \$10 million in the project.

Counterespionage

Auto critic Ralph Nader gained a lot of fame when General Motors arranged for a detective agency to investigate him. So it brought a chuckle when it was learned Nader was doing some investigating of his own. Nader got a team of college volunteers to investigate the Federal Trade Commission. Nader feels the FTC has dragged its feet on probing the auto industry, among other areas.

GM Mini

GM XP-886. That's one code name being used by General Motors for the new small car it's developing. As seen at the GM Proving Ground near Milford, Mich., the basic body shell is a 1967 Opel Kadett fastback. But it's been channeled and sectioned below the belt line. The car is 2½ inches lower than the production Opel. It also has ventless side windows. It doesn't have any visible rocker panels. The car carries 14-inch Pontiac wheel covers. The car seen at the test track is not the one which might go into production in a couple of years. It's a mechanical prototype built to test the running gear of the new model. It appears from an over-the-wall look at the car that GM is developing a standard driveline—front engine, rear drive. Judging by the size, the car will be about the same dimensions as the Volkswagen. It's supposed to have a 96-inch wheelbase. One report, however, says it may be a few inches smaller than the Beetle. /MT



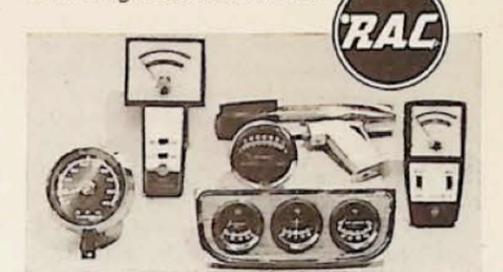
When you're in racing, every now and then the competition gets up-tight and you respond with a socko car. The Dodge Charger 500 is a socko car. It is a Charger that comes with a flushed grille, full fastback and the hemi 426. The idea was that Dodge would be even more potent on NASCAR's high-banks with a little clean up on the Charger. Voilà, Charger 500.



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Brand-new 100-page book, written by All-American Racers' Eagle builder-driver Dan Gurney; pro-driver and author Jerry Titus; and drag star Gas Ronda, contains factual information never before published to help you get better performance and mileage, save on repair bills, and keep your car in top tune. Loaded with performance secrets, this book tells how to get the most out of your machinery. Chapters on... Competition cars, street machines, and dragsters... The professional view of instrument placement in the cockpit... How to understand the language of gauges... Easy guide to a perfect tune-up... Instrumentation at 200 MPH... And many more!

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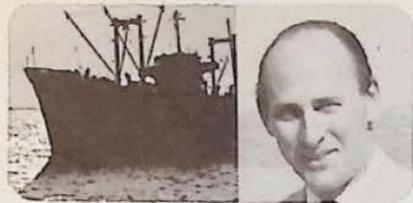
The Mini Fight

The Austin-Morris "Mini," which brought fame to its "father," British engineering genius Alec Issigonis, and millions of pounds to BMC, long lived without any competition as the European city car. Then came Honda's own "Mini"—Japan's faster but otherwise closely imitated version of the English car, which is becoming a best-seller on France's sophisticated market, and making steady progress in countries like Belgium and Germany.

Fiat, only other producer of a true "mini-car," the 500, never really worried about foreign competition in this field. Fiat's 500 was launched in 1957. Italy was then "Vespa-land": the 500 helped put the country on four instead of two wheels. From 1960 to 1968, 28% of all cars produced in Italy were 500s. The devaluation of the pound, which helped BMC double its sales of Minis in the Common Market this year, and Honda's break-through finally prompted Fiat to give the "500" its first face-lifting in more than 10 years.

A new Italian "Mini" is to be launched—possibly before year's end. According to unofficial indications, it will be wider and roomier than the present 500—while remaining just as short

Overseas Report



by Edouard Seidler

(overall length: 9 feet 10 inches). It will thus be closer than ever, in appearance, to the BMC car. In order for it to remain reasonably close to it on the road as well, Fiat's engineers are to fit their new baby with a 585cc (36-inch) engine, to replace the old 500.

The car's top speed will thus move from a weak 62 mph to a more sensible 70 mph. The new 500 should still, however, be Europe's cheapest car. While the present model is selling for an average \$920, the new one will not cost more

It's destined to hit the domestic market hard, and when it does, very soon, the new Opel GT will affect sports cars costing more than twice as much — even Porsche, at whom they are aiming. The coupe will be available in two mechanical versions. The cheaper one (not to exceed \$2800 and therefore underselling Fiat's 124 Coupe) uses a 65.8 cubic inch (1078cc) engine derived from the Kadett Rallye 1100 powerplant. Horsepower is 67 at 6000 rpm, and top speed is 100 mph. The other is 1897cc, or 116 cubic inches, and 102 hp, with a top speed of 125 mph and European price of less than \$3600. Front disc brakes are standard. Interior is poshly done.



than \$1000 — thereby clearly underselling both BMC's and Honda's Minis (starting price in Europe: between \$1300 and \$1400).

For Europe Only

Along with Peugeot's 504 (see MT, Oct., '68), the Renault 6 was the star of the Paris Auto Show. A true economy car, the "6" uses the base of Renault's "4" model, the 845cc (51.8-inch) engine of the late Dauphine-Gordini, and reproduces in part the design of the larger Renault 16. The car cruises at a mere 75 mph. It will sell in Europe for a little over \$1500 and will therefore please many a beginner. A front-wheel-drive 5-door car like the Renault 16, the "6" should be a successful addition to the growing list of Europe's new 2-faced cars: sedans with the practicability of station wagons through their hinged backdoor.

The Renault 6, for the time being, will not be sold in the U.S. "We can't afford to promote more than one or two cars at a time on the American Market," Renault officials say. "Our Renault 10 is doing well in the U.S. We now have our hands full with the promotion of the 16."

The Renault 16 had been in produc-

tion for over three years before it was launched in the U.S.

VW's Best

When Volkswagen's latest model, the 411, started rolling off the assembly line in August, beaming Wolfsburg engineers rejoiced: "This is the best car VW ever made." It is the biggest, too, and the most comfortable. The 411 will have to answer this question: can VW succeed with anything but the Beetle?

Under Professor Heinz Nordhoff's leadership, VW never managed to make a real success of its larger models. Kurt Lotz, new president of Germany's record beating exporter, is out to prove that VW's future does not necessarily have to match its past.

He would also like to show that Volkswagen can pull a trick on its own. Wolfsburg managers insisted on the fact that their new associate, Italy's leading stylist Pininfarina, had nothing to do with the new car's design.

The 411 is no record breaker. Its 1679 cc 4-cylinder engine (76 hp) gives the car a top speed of 90 mph. Volkswagen, no doubt, could have done better. But engine speed was voluntarily restricted to 4740 rpm. This limited potential will be disappointing to many Europeans,

since Fiat (with the 125) and Renault (with the 16TS), among others, now offer cars with similar displacement and comparable prices, cruising at well over 100 mph.

Volkswagen, however, will bet on the comfort and endurance of its newly born car. By European standards, the 411 is a large (total length: 14 feet 10 inches) automobile. It is both well finished and built to fulfill every U.S. safety requirement. One of its main assets on the American market should be its automatic transmission, an option which few European competitors are ready to offer in the same price and power range.

Volkswagen exports during the first semester moved up by 36%. "With the 411, we should do even better next year," a Wolfsburg spokesman said. But insiders are now waiting for the new Pininfarina-designed Beetle. There is no auto show in Germany this year, but there will be a Frankfurt show in 1969. Observers recall that VW rarely came empty-handed to its national car exhibit.

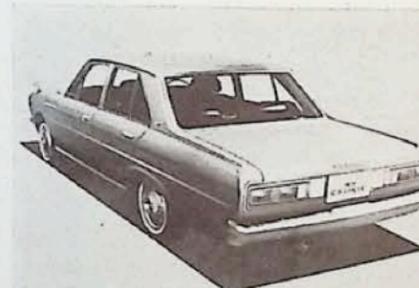
BMW Moving Up

A few years ago, BMW was on the verge of bankruptcy. It took no more

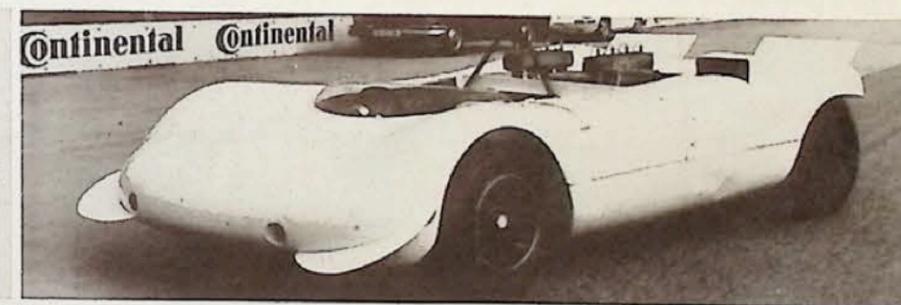
than a few well-priced and well-finished high-performance family cars to put the firm out of the red: production this year should pass the 100,000-unit mark. 65,000 cars will be in the 1.6-liter range, 40,000 will be 1.8- and 2-liter models. The last 3000 are expected to be brand new V-6 2.5-liter cars.

The "big" BMW was to roll off the assembly line in late fall. While preparing to launch its 6-cylinder engines, however, BMW brought new improvements to its 1.8- and 2-liter range. All the cars in this class are now using the same 4-cylinder block. Stroke and bore have been modified, and piston speed greatly reduced, with no loss in power, but improvement in silence and reliability. All cars in this range are fitted with a new dual braking system: things coming to the worst, the car will still keep 60% of its braking power. The 1800 has an alternator and a new 12-volt electric plant. Ventilation is greatly improved. Dashboards have been redesigned and carefully padded for added passenger safety.

The reason for all these changes? "Quality and safety!" BMW's engineers say. To which a top manager in Munich promptly added: "Our target now is to further improve our U.S. sales." /MT



(Above) Though there is basis for doubt that Datsun's domestic marketers named their new 2000 Cedric, it's nevertheless now fully competitive with American makes, with automatic transmission, power steering, air conditioning and a luxurious interior. (Right) Simca for 1969 has increased the displacement of the small car engine to 68 cubic inches or 1118cc, with more torque and power. In the background is the new front-wheel-drive 1204 deck-door model.



(Above) Another Porsche prototype is a good bet for securing their 1969 dominance of hillclimbing in Europe with its 183 cubic inch (3-liter) engine in a titanium chassis car. (Left) With the introduction of the Datsun/2 for \$1866, Datsun has managed to lower their price \$133 under their cheapest 1968 model. Would you believe 96 horsepower?



George Eby of Ice Capades doesn't mind paying a little less.



George Eby, president of Ice Capades spent \$1½ million for the 1968 edition, but he rents from Airways Rent-A-Car because he really doesn't mind paying a little less. When he rents a Chevrolet Impala or other new car from AIRWAYS, he gets *more* and pays *less*. He can rent a car at most

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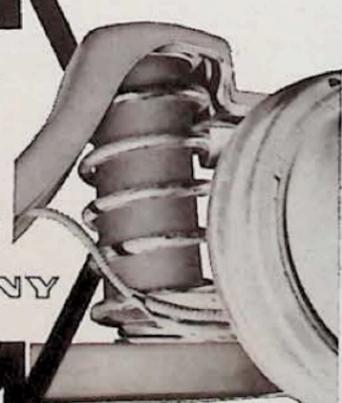
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DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Calendar of Events

December

- 1 Rex Mays 300 —
Riverside, Calif. (Indy Cars)
- 1-8 Detroit Auto Show, Cobo
Hall, Detroit, Mich.
- 1-8 Houston International
Auto Show, Astro Hall,
Houston, Tex.

Ground breaking ceremonies, at the 700-acre site east of Los Angeles officially launched the \$25.5 million Ontario (California) Motor Speedway, a multi-purpose auto racing facility scheduled for completion in the fall of 1970.

Speedway officials, headed by Board Chairman Dan W. Lufkin, were joined by actor Kirk Douglas, Ontario Mayor Howard J. Snider, city and county dignitaries and prominent members of the auto racing fraternity for the traditional spade work which was heralded as the beginning of a new era for American auto racing.

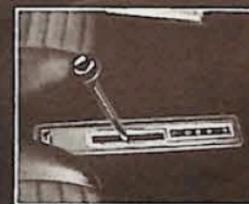
The new Speedway represents the largest single investment ever expended at one time for an automobile racing facility. When completed it will have the versatility of accommodating all major forms of motor sports including a 500-mile race for Indianapolis cars as the inaugural event in 1970, over a 2.5-mile oval similar to the Indianapolis Motor Speedway. A stock car race of equal distance also is planned for the oval while a 3.5-mile road course will be used for European sports car and formula-type races. Provisions have also been made for a drag strip, utilizing a portion of the main straightaway where a premium drag race will be held annually.

Facilities for spectators and competitors have been aimed at elaborate comfort and convenience, to rival other major sports stadiums and arenas across the nation. One of the new Speedway's most unique features will be 100% viewing from the 95,000 permanent grandstand seats. There will be an additional 40,000 temporary steel bleacher seats plus infield room to accommodate a total of more than 200,000 spectators.

"In terms of spectator attendance," Lufkin said, "auto racing ranks second only to horse racing. More than 40 million fans attended races in 1967 and we expect 1968 figures to reflect a sizeable increase over that sum. /MT



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\$2115* 90 hp never felt so good. 0-to-60 in 16 seconds. Tops 90 mph. A car built for performance, the sporty Corona zips ahead of the pack, and still delivers about 25 miles or more per gallon. Good for the ego. Great for the pocket! Real comfort too. Luxurious bucket seats. A ride that's soft, and library quiet. A solid 4-on-the-floor . . . or an easy going fully-automatic automatic (optional). Even factory air conditioning (optional). Test drive the Toyota Corona, today. It's America's lowest priced 2-door hardtop. And that's going some!

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M Letters

Voices From the Grave

Has Eric Dahlquist been hitting the bottle again? His pride and joy article *Chevy's Heavy Lightweight* (Sept., MT) was ridiculous and insulting. Who is he trying to kid? Ford is probably laughing in his ignorant (or prejudiced) face. The Ford 427 sohc (\$3300) puts out 616 hp and better than 750 hp with injection. I would like to remind Mr. Dahlquist that the 616 hp the sohc cranks out is under CARBURETION not injection like the 427 Chevy mill. I have two pieces of advice to hand out. (1) Eric, join the AA; (2) Chevy, back to the drawing board.

Joseph Jancsovic
Chicago, Ill.

...The Chevy engine although being aluminum and injected and with a fairly wild cam is still trying to catch Ford's better idea. Smarten up.

Walt Pierce
Cornelius, N.C.

...On the Sept. '68 cover, you posed the question: *Is Ford Dead?* My dear sirs, not by a long shot. For those fans who think Chevy has really pulled the

rabbit out of the hat, I'd like to bring to their attention that in early '68, Ford came out with a 302 mill which screamed over the 500 horses on the dyno. It wouldn't be boasting to say they couldn't get over a 200 hp gain on a 427.

Jim Creseghona
Southampton, Pa.

...The statement on Page 48 of the Sept. '68 issue, "...is made from 356 T-6 heat-treated aluminum..." is redundant. T-6 indicates that a specific aluminum alloy, 356, has received an equally specific 2-stage heat treatment.

J. Howlett
Aberdeen, Md.

Considering alloy Chevys won the first three Can-Am events of '68, Chevy fans should have some comment. The Editors.

Schmidt vs. The World and Charles Sinclair

Re: Julian G. Schmidt's "road tests:" Is he for REAL? For God's sake make him stop writing like an effete Tom McCahill.

Vernon Goodrich
Silver Springs, Md.

...It seems Charles Sinclair scolded writer Schmidt (Sept., '68) for the article

(June, '68) in which Mr. Schmidt failed to share Mr. Sinclair's bloated opinion of Mercedes-Benz cars. One thing Mr. Schmidt must admit — Mercedes-Benz has made good use of 1937 Pontiac body dies all these years.

T. Honsmien
Pasadena, Calif.

...In your Sept. '68 issue, Mr. Sinclair says he owns six Mercedes-Benz and thinks that all other cars are inferior. I must admit that Mercedes-Benz is a good car, but calling Corvettes "plastic" and Lincolns and Cadillacs "tin foil" is getting a little out of hand.

Morris Bacon
Kirkland, Wash.

...A Corvette will out-accelerate and out-handle a Mercedes-Benz or a Studebaker Golden Hawk.

Pat Sharpe
Tecumseh, Mich.

...I'll bet you a year's subscription to your magazine that one of your own staff wrote that "Interchange" (Sept. '68) letter, supposedly from a Charles Sinclair of California!

Mrs. B. F. Merenda
New Orleans, La.

...I thought the criticism of Julian

People write to



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

Underhauled? I have a '65 Vette with a 365 horsepower engine that's driven pretty hard and has 30,000 miles on it. It has what some of my friends call "blow-by", yet it doesn't smoke at all from the tailpipes and it doesn't use much oil between changes. Should I have it overhauled? What weight oil should I use?

G.R.G., Mankato, Minn.

It doesn't sound as though you need an overhaul. We suggest you have a wet and dry compression check on your car before you start talking the kind of money an overhaul would cost. Also, from what you say, we recommend an SAE 30 weight oil for your kind of driving. In winter, you'd do well to change to SAE 10W for better low temperature performance. It gets cold up there where you are.

Mini Maker. I have just finished building a mini bike. It has a four-cycle Briggs & Stratton engine. What weight oil should I use for it?

D.H., Spencer, Iowa

SAE 30 detergent oil should be maxi for your mini.



Plane Wrong. What problems can I have if I use 115/145 octane aviation fuel in two cycle or four cycle engines? Is it a good idea to mix aviation fuel with regular gasoline?

SP/4 R.J.S., Fort Buckner, Calif.

While we've had little to do with aviation fuel in cars, we do know it could cause vapor lock and other problems. We'd suggest you not use it.

Weekend Workout. I own a '57 Chrysler Saratoga (354 cubic inches) which doesn't go anywhere during week days. But I drive it hard on the weekend. Will the five days' idleness affect the vital components of the running gear?

C.M.P., State College, Pa.

Since your car stands idle for five days at a time, we urge you to start the engine and idle it slowly. Do that for a few minutes to re-lube vital engine components. When you start up, drive at low speeds for a few miles to give the same lubrication to running gear components. It's like doing a few easy exercises to get the blood flowing in the morning.

Shiftless Information. I own a 1966 Buick Special Deluxe which is equipped with a two speed automatic transmission. My owners manual says I should change the transmission fluid every 24,000 miles. My friends say no. They say the new fluid will deteriorate the seals and cause them to leak. Are they right?

G.C.G., Kansas City, Kan.

No, no and no. Seals should not leak in your '66 car, even with 24,000 miles. And the addition of fresh fluid will further prevent leakage. After you drain some of the old lubricant, the new automatic transmission fluid will fortify the oil with additive supplements.

Number Five Is A No No. I have a 1959 Ford, six cylinder engine. In numbers one, two, three, four and six cylinders I have all 120 pounds compression. But in number five, I have 95 pounds compression. Could it be the bearings?

D.A., Port Arthur, Ontario, Canada
That low compression probably indicates a broken ring or burnt valve. The bearings are not at fault. After you've overhauled your engine, we recommend you use Pennzoil Z-7 motor oil.



The Old And The New. I would like to know if a detergent-rated oil will do harm to an old engine and torque converter that have been run for many years on non-detergent oil. She's a well-cared for 15-year-old Plymouth with only 87 thousand miles to her credit.

J.R.T. II, Dollar Bay, Mich.

No harm will come to her if you clean out the sludge prior to using a detergent oil. We recommend Pennzoil with Z-7. Just drain the new oil for periods of 500 to 800 miles for two or three drains and she'll run as good as new. And cleaner.

At 24,000 miles, most shock absorbers are dynamite. Drive over holes, bumps, or around sharp curves—and they can drive you right off the highway.



If time is running out on your shocks, change to Monroe®. They keep your wheels on the road—automatically adjust to all road and load conditions. More people change to Monroe Shock Absorbers than any other.

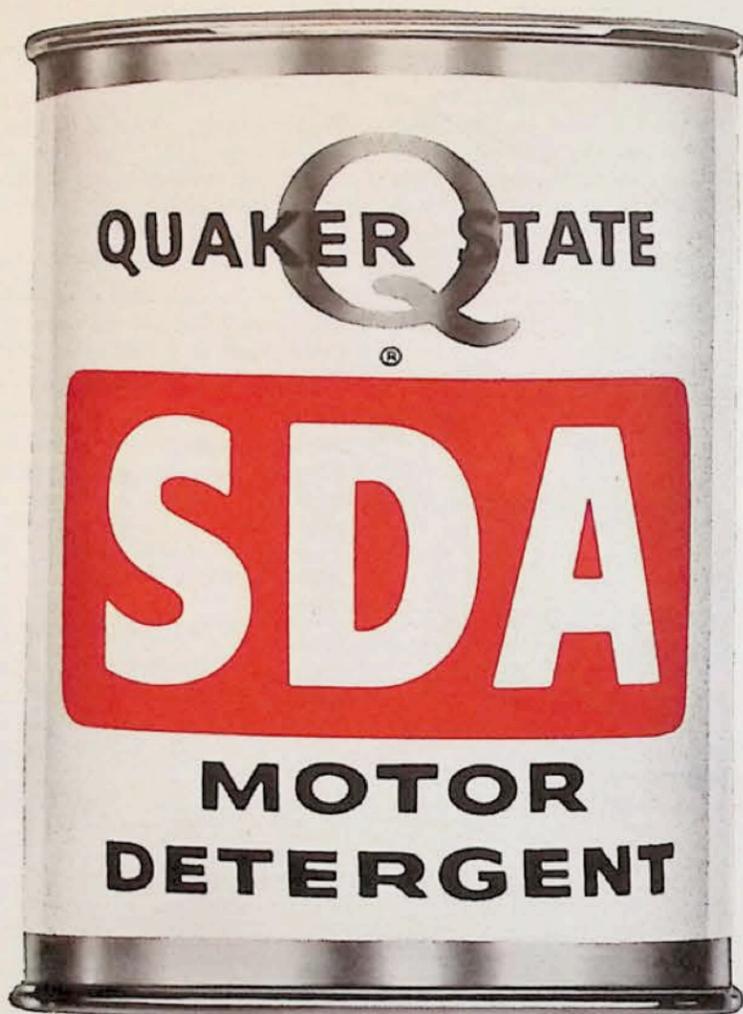


Monroe Auto Equipment Company
Monroe, Mich.



ask for it!

The answer to sticky problems.



When your valve lifters get sticky, you get stuck with poor performance. The old zip in your engine fades.

But you can bring it back with Quaker State SDA. It takes problems like these in stride. Frees up sluggish valves, lifters, and piston rings. Cleans out the offending varnish and sludge deposits. Restores the power your engine should deliver.

And not only does SDA help get your engine to go better, it helps it in stop and go driving.

It helps the engine prevent rust and corrosion that build up with short haul or intermittent operation.

All this sounds like a major overhaul. But it isn't. In just 2 minutes SDA goes to work to tune up your engine.

Quaker State your car to keep it running young.



MT LETTERS *continued*

Schmidt (Sept. '68) was unjust, in poor taste, and in my opinion the idle flabber of a bunch of soreheads. The man who complained about the listing of a Mercedes had only to read the September issue of MT and the outstanding article on the Mercedes by Mr. Schmidt who in my opinion is a terrific automotive journalist whose works are read and enjoyed greatly by myself.

Cdr. R. F. Walker
Woodland Hills, Calif.

Well, Sinclair, are you going to take this lying down or are you going to defend your honor? The Editors.

Schmidt Strikes Again

"Death Valley Daze" (Sept. '68) by Julian G. Schmidt was a very interesting article as I have made several trips through the area. When Mr. Schmidt tells of Ballarat and 1807 and 1817, don't you think he should check up on his dates?

Francis L. Dobbas
Newcastle, Calif.

The mayor personally took us to City Hall. The Editors.

... One of your subscribers has complained to us regarding an article in the September issue of Motor Trend "Death Valley Daze," written by Julian G. Schmidt. The tone of this piece is complete disregard for the law and for the rights of others. It is clear that Mr. Schmidt has admitted to deliberate violations of Federal regulations. If we are correct, we believe that Mr. Schmidt should be admonished, and that it would be in order for you in your next issue to go on record as opposing the kind of thinking expressed in the article.

John W. Stratton
United States Dept. of Interior
Superintendent, Death Valley
Mr. Schmidt has been admonished, seen the error of his ways and promised to restore Death Valley to its original condition. The Editors.

With his piece cleverly yclept "Death Valley Daze" (chuckle), Mr. Schmidt has achieved a new pinnacle of gaucherie and literary ineptitude. It is entirely understandable to me, having seen what gun-nuts tend to do to public and private property with fine impartiality, that Ballarat's local constable should be willing and eager for your little band to be somewhere else.

S. K. Jelf
Lomita, Calif.

... In your article "Death Valley Daze," you had a photograph on Page 65 of what appears to be a 1906-07 Best

CHAPTER TWO: THE RENAULT 16 SEDAN-WAGON



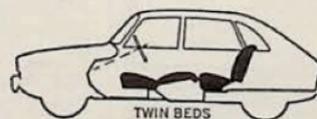
Our story opened with the Renault 10. And that chapter is being written every day. At last count, there were over 35,000 Renault 10's on the road.

And so the stage is nicely set for our latest installment: The Renault 16 Sedan-Wagon.

There isn't anything in the world quite like it.

When it was introduced to Europe in 1965 it was voted Car of the Year by a jury of 32 international car editors. A Rolls-Royce placed 2nd. The Oldsmobile Toronado, 3rd.

The Sedan-Wagon. Besides being a new chapter for us, the



Sedan-Wagon represents a new chapter in the auto industry.

Until now, even if you only needed a station wagon occasionally, you had to drive one around all the time. With the Renault 16, you drive around a sedan. And when you need a station wagon, it turns into a station wagon.

The front-wheel drive. Quite logical. The engine up front to get maximum hauling area in the rear. The drive wheels also up front to get maximum traction from the engine's weight.

The engine. Pressure cast aluminum block. 5 main bear-

ings. And a sealed liquid cooling system that virtually eliminates the bother of having to add anti-freeze. It can milk 30 miles out of a gallon of gas, and still manage a top speed of 93 mph. It is so well put together that you could roll up 30,000 continuous miles at 85, as we did, back and forth and back and forth between Rome and Milan.

The seats. They're every bit as comfortable as those in the Renault 10. And the seats in the Renault 10 have been stacked up against the seats in the Rolls-Royce.

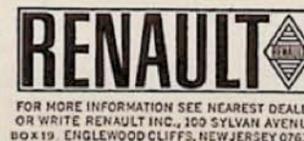
The road manners. The suspension is soft, without being mushy. Each wheel moves up and down independently, controlled by extremely long torsion bars. It has self-adjusting, no play, rack and pinion steering. As well as 2 anti-roll bars. It can haul around curves at heart-freezing speeds, so incredibly does it grip the road.

The braking. Pressure limiting drum brakes in back that automatically adjust to load weight. Huge self-adjusting disc brakes up front.

The ventilation. All the fresh air you want without the roar of open windows. Plus the convenience of a heating system flexible enough to pour warm air on your feet and cool air on your face.

There is much, much more we'd like to tell you about the Sedan-Wagon. Not the least of which is its price. \$2,445 P.O.E.* But it is rapidly becoming apparent that in writing about chapter two, we are beginning to write a book.

To be continued.



Fix sticking automatic chokes fast . . .

Frees Sticking Chokes—

Squirt on both ends of choke valve shaft. Remove choke cover and flood vacuum cylinder while engine runs. It's fast!



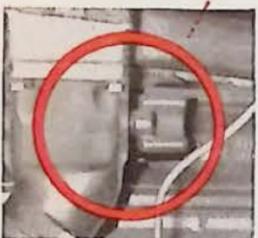
Cleans Carburetor

Linkage—Dirty, oily linkage can badly foul up carburetor performance. Clean it in seconds!



Loosens Manifold Heat

Controls—Quickly penetrates and frees heat controls frozen by rust and carbon. Leaves no oily residue to cause further sticking.



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"Racing World's Mailorder Supermarket"

MT LETTERS continued

steam traction engine. What is it pulling?

Russell Harlay
Elburn, Ill.

An Airstream trailer. The Editors.

There's One Born Every Minute

This issue of your magazine (Sept., '68) is a fraud. I bought it on a newsstand thinking that I would find inside a look at the 1969 models. Only about two 1969 model cars were included. Your headline, "All New '69's" is grossly misleading. So is the primary cover illustration. What is it, anyway? I thought Petersen was above such "pulp" tricks to get newsstand sales. If I hadn't discovered my mistake until after I was on an airliner, I would have taken this one back and demanded my 50c.

John Krizek
Belmont, Calif.

... This is weird. On Page 5 of your Aug. '68 MT it says Q&A is on Page 100. On Page 100—"Brakes con't. from Page 43." An article just doesn't walk away! Where was it?

Ben Wilp
Wyoming, Mich.

In this case that's what happened. There was no Q&A in August. The Editors.

Policy Racket?

I would like to know if something is being done about the outrageous prices that we have to pay for automobile insurance.

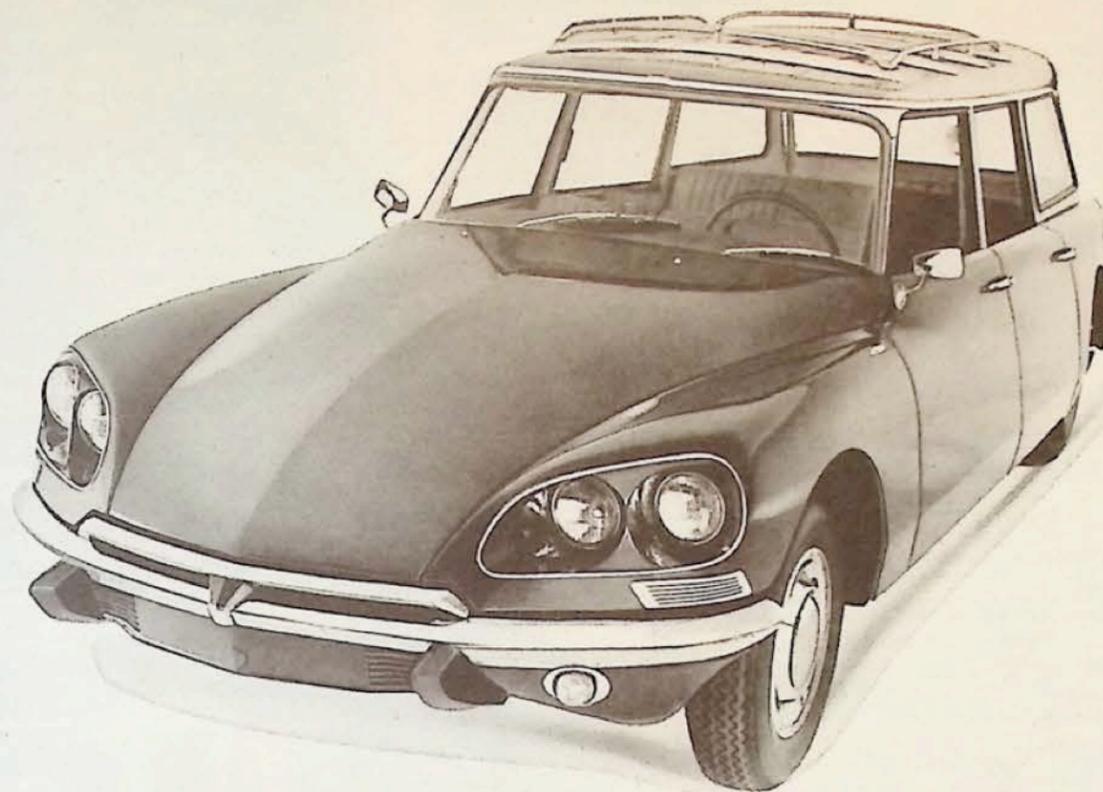
David H. Putham
Big Creek, Calif.

Yes, we're paying them. The Editors.

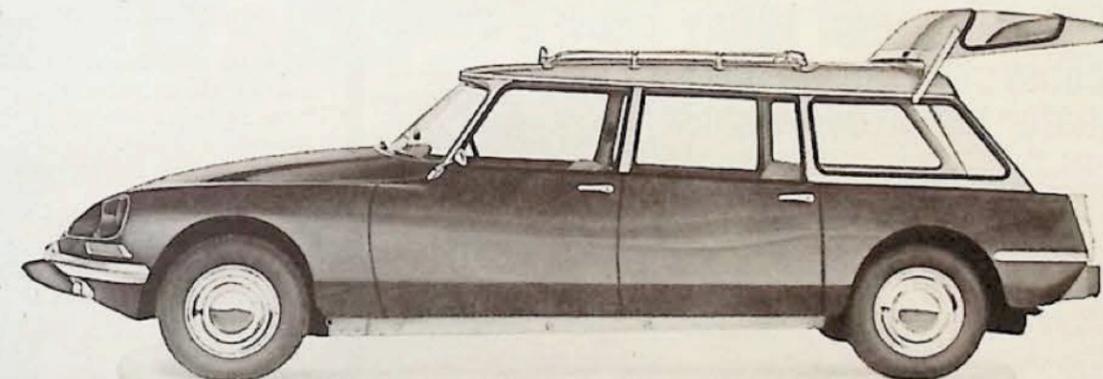
Sucking The Doors Off Dept.

Regarding Mr. Leo Levine's statement in his "Viewpoint" article in your August issue that "The 390 Fairlane, for instance, gets its doors sucked right off the hinges by such things as Chevelle SS396s," all I can contribute is the fact that there are several SS396s (325 hp) in this area that would, however, reluctantly disagree with this statement. I personally, along with some help from my 1967, 390 (325 hp) Fairlane 500, not a 335-hp GT, have seen to this. I have had much closer runs from 327 (300-hp) full-bodied Chevrolets. Also, regarding the Cobra-Jet engine, I have beaten a few 389 (335-hp) GTOs and consider the Cobra Jets considerably quicker than my 390, as their recent and increasing class wins in AHRA and NHRA verify. It would seem to me that Mr. Levine's personal dislike of Ford products tends

CITROEN WAGON:



MORE CAR. LESS TRUCK.



A station wagon leads a double life. First—it's a wagon, then it's a car. That it happens to handle like a truck is the price you pay in most wagons today.

Not so Citroen! A Citroen wagon is first a car . . . then a wagon, giving you the best of both.

Revolutionary hydropneumatic suspension gives the Citroen wagon greater roadability and the world's smoothest ride. (The same ride you get in a Citroen sedan).

Front wheel drive assures precision steering and control plus road-hugging traction. And since there is no driveshaft tunnel, a Citroen wagon has more load space so you can take almost anything, anywhere. Adjustable road clearance lets you go over back roads, rough terrain, or snow drifts.

You can even use it to change tires without a jack.

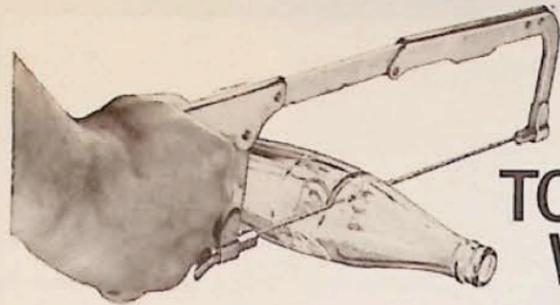
Drive anywhere you want, you still get Constant Level Ride whether you're traveling alone, with 6-7 passengers, or a ¾ ton payload. You can't say that about any other wagon. Even with a full payload you can stop short and sure with Citroen's instant-acting power inboard disc brakes which make this wagon one of the safest on the road. No other wagon has them.

Add to all this an amazingly smooth, quiet ride. The Citroen wagon rides like a Citroen car even at speeds over 100 mph because it shares the same unique aerodynamic design which reduces air resistance and turbulence. The Citroen wagon . . . first a car . . . then a wagon.

CITROEN

Sales and Service throughout the U.S.A. Check the Yellow Pages. For Dealer List, literature, and European Delivery brochure, write: Citroen Cars Corp., East: 641 Lexington Avenue, New York, N.Y. 10022. West: 8423 Wilshire Boulevard, Beverly Hills, Calif. 90211.

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THE TOOTHLESS WONDER.

Our new Rod Saw has no teeth. Instead, it has thousands of permanently bonded tungsten carbide cutting edges.

The rod itself fits any standard 10" hack saw frame. But the similarity ends there. Because the Rod Saw cuts through things a regular hacksaw blade won't even scratch.

It cuts through spring steel, hardened bolts, welds and cast iron with ease. And because of the tool design, the cutting edges go all the way around the rod. So it not only cuts straight, but also cuts in any direction on brick, glass, flagstone, ce-

ramics, fiber glass, laminates and other hard-to-cut materials. (And does it faster, because it cuts on both forward and backward strokes).

Originally developed for industry, now priced for home use, the Remington Rod Saw is now available at most hardware stores.

You should not have any trouble recognizing it. Just look for the saw without any teeth.

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Please send me () Lenroc PCV valve testers, the only patented visual PCV testers on the market today.
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MAIL THIS COUPON TODAY You could save the expense of a major motor overhaul.

The Lenroc PCV valve tester checks the PCV (Positive Crankcase Ventilation System) valve, the sole control on re-cycling of unburned vapors back to the firing chambers for reburning. Recent production autos are required to have this pollution control system. This second check with the Lenroc valve tester is the only visual check available today. The PCV valve may go any time — check every time you gas up. A dirty or clogged PCV valve results in ■ Rough idling and stalling. ■ Missing at high speeds. ■ Drop in gasoline mileage. ■ Increased oil consumption. ■ Ruptured gaskets and seals. ■ Low power — general poor performance. Without the Lenroc valve tester the PCV valve must be bench checked. A bench check could be four times the cost of the Lenroc tester.

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HOW IT WORKS

Simply place tester over engine oil fill hole (with engine idling). If ball goes to SAFE your PCV valve is working — if to DANGER, it needs replacement... immediately! Easier than checking the oil level and quicker. Know before any engine problems develop.

Mail coupon today — It could save you the expense of a major motor overhaul!

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MT LETTERS *continued*

to alter the true picture of, in my opinion, the Superior Product.

W. D. Sells,
Designer, Ford Motor Co.
Louisville, Ky.

Mr. Levine does not have a personal dislike for Ford. As a matter of fact, he has just published a book on Ford's performance and racing history called "The Dust and the Glory," published by MacMillan Company. The Editors.

Finders, Keepers

I noted with interest the information and specifications on the high-performance Oldsmobiles in the September, 1968 issue. It is extremely unwise for many of us who must street park to invest in a machine which advertises so boldly. Such ownerships are extremely short-lived in many areas. A person in this type of situation, who would like to invest in such an automobile, might appreciate the option of requesting a conservative exterior treatment not so much for surprising the street racers, but rather outfoxing the "street takers."

Arnold Rosenstock
Bronx, N.Y.

The Hot Tip

Here is a tip for 283 or 307 cubic inch Chevrolet owners who want a little more power for just some of their own labor. All you have to do is drill about 14 1/4-inch holes in the front of the long stem of the air-filter cover and then angle the stem toward the left. If the car has air conditioning, the idling might have to be turned up in the summer months.

Steven D. Boldebeck
Arvada, Colo.

Very Interesting Position

The photo of a Plymouth VIP after a panic stop from 60 mph in your article on luxury cars (May, '68, p. 58) was of special interest to me. I own a 1967 Plymouth Fury III sedan equipped with power disc brakes. I have on two occasions been compelled to come to a full panic stop, once from 60 and once from 40 mph, and on each occasion my car came to rest in precisely the same position as your test car.

Hyman Weber
Flushing, N.Y.

The 845 Horsepower Buick

Wow! 845 hp at 4800 rpm! Buick is going to blow Mr. Nader's mind this year. Where can I get a Stage I GS 400?

Michael J. Graham
Kingsville, Tex.

Regular 350-hp Stage I Buicks are at your local dealer. 845-hp models have been seen in vicinity of Cape Kennedy. The Editors.

/MT

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Add fire to your fuel with the cheapest power boost since slip-streaming. STP Gas Treatment boasts cleaning power, too. Prevents engine deposits. Removes gum and varnish. Keeps your carburetor and engine clean. Prevents rust and corrosion. Increases gas mileage. Reduces knock and ping. Frees sticky valves. Supercharges. tunes and smooths out engine performances. Prevents carburetor icing and stalling. Increases engine life. Lubricates and protects upper cylinder area. Gas up with STP—a sure-fire formula. Available at service stations everywhere. Big charge at little cost.

You'll feel the difference with the very first can.

STP Corporation,
125 Oakton Street
Des Plaines, Illinois 60018

First there's The Street,
then add a few New York-type hustlers,
about 1000 domestic cars
and exotic imports a day
and what do you wind up with...?

by Leo Levine

JEROME AVENUE

Before we get going there's one thing you've got to understand; it's a different world on Jerome Avenue. It's not like anything you've ever seen.

For a starter, take this little item. They sell more than 1000 used cars a DAY on less than a half-mile of it.

For another, try this. The best speedometer "adjuster" (let's call him that for want of a better name) on Jerome Avenue is reputed to clear \$2000 a week — all in cash, in \$10 bills stuffed in his pockets as he pulls his little cart full of tools from one dealer to the next. You're shocked? Don't be. Everyone does it, all over the country. You see, Virginia, there really is a Santa Claus. It's only that he doesn't always wear a red suit and a white beard...

It's different unless you're a New Yorker. You could be an Irishman or a Jew or an Italian or a Negro or Puerto Rican or even a WASP from the financial district who speaks in what Tom Wolfe has termed "work" accents. If you're any one of these you understand it, because as a New Yorker you're a hustler. That's the way the town's constructed, and whether you hustle numbers or bets or stocks and bonds or advertising or anything else, you know what it means to run fast just to stay in one place.

(Nobody's asking the rest of you to like New York; you probably live in a town that's a lot nicer and cleaner and all that. This is just the way it is.)

Jerome Avenue is in The Bronx, the northernmost of New York City's five boroughs (Brooklyn, Manhattan, Queens and Staten Island are the others). It's where 2 million persons are crowded into 26,520 acres — and 20% of that is public parks. It is bounded by the Harlem River and Manhattan Island on the south and west, by the East River and the lower reaches of Long Island Sound on the East, and by Westchester County to the north.

It is a sprawling sardine can of humanity and it used to have some well-established ethnic divisions. The Irish, who always ran The Bronx from a political standpoint, were and are located on the west side, together with their Fordham University, their Manhattan College, a goodly number of saloons and Gaelic Park, which is located off upper Broadway and is where they participate in a gentle old world sport known as hurling, which is played in shorts and T-shirts with a hard ball and a club. It makes football look like a game for sissies and the main entrance to Gaelic Park is through a bar. Ever see the main entrance to a ballpark in a bar? Stick around this town long enough and you'll see everything.

A bit more to the east are the Jews, about 400,000 of them. The Grand Concourse used to be their version of Park Avenue

but now it's beginning to change, with the Jews moving north to Westchester along with the Italians who lived in the East Bronx, and the Negroes and Puerto Ricans moving in as Harlem becomes too crowded. Even the borough president is of Puerto Rican descent, despite the Irish political bosses.

Jerome Avenue, at least the automotive part of it, is Jewish. But nobody around here pays any particular attention to that. It is just the way things are. About the only way out-of-town buyers know it, or are reminded of it, is when they show up on Yom Kippur and find everything is closed. (Despite what you might have heard, that's not the name of a Japanese general.) The Bronx is the melting pot, a grubby cosmos unto itself, the place first named Concrete Jungle.

Jerome Avenue runs north and south on the west side of the borough and its crowning glory, in a negative sense, is the El (elevated train to you foreigners), that anachronism of mass transit which stretches its steel legs down to the seamy street, choked with dirt and traffic. They built it before World War I and they had to stick it in the air, because when you start digging in The Bronx you find granite underneath, and blasting is expensive. The El permits only a limited amount of light to penetrate to the road below; it is almost as if someone were afraid what they would find if they could really see down there.

If you follow the Jerome Avenue El to its northern terminus, you'll reach Woodlawn Cemetery, where John Barrymore and Ruth Snyder and Judd Gray and lord knows who else is buried. It used to be the most fashionable cemetery in New York, a sort of Forest Lawn with snow in the winter. But that was a long time ago. North of Woodlawn is Yonkers, the largest city in Westchester and by far the seamiest; another cemetery, but this time with lights.

The part of Jerome in which we are interested runs from 175th Street to 170th Street and is split in half by the concrete gully that carries the Cross-Bronx Expressway. The area looks like something Maxwell Anderson could use as a scene for a sequel to "Winterset," and it is known in the trade as The Street. The fact that Woodlawn Cemetery is to the north, or Yankee Stadium is another half-mile to the south, or that it's not exactly Wilshire Boulevard is of little interest on The Street. It is all trivia, miscellany, things for which they have no time. They've been here so long they no longer hear the El rumbling by overhead, and they are so hurried their world is bounded by 170th, 175th and the telephone. (If it weren't for Don Ameche, Jerome Avenue would be in bad shape, as they do business all over the world.)

But this is where the action is, right in the middle of the nation's largest sardine can. More than 1000 cars daily, and



Shielded on one side by elevateds and on the other by inconspicuous merchants, the hawks of Jerome feverishly examine all their wares.

all of them used. Jerome Avenue is to the used-car market what Wall Street is to stocks and bonds. This is the largest wholesale used-car area in the U.S. This is where the market is made, where they decide whether your '64 Chevy Impala with 55,000 miles on it is worth \$300, \$600 or something in between.

Don't be surprised there is such a thing as a wholesale used-car market; there is also a wholesale new-car market, with the manufacturers wholesaling the cars to the dealers and the dealers retailing them to you. The wholesale setup with used iron works this way: let's say you are a dealer in Stroudsburg, Pa., and in the last two weeks practically every person who purchased a new car had an older model to trade. Your lot is now full to overflowing — and maybe you have six '65 Ford 4-door sedans, which is a bad "mix." Inventory is high, your bank account is low. You have to move some of the stuff, and move it fast. The Street is the place. You won't get what you'd like to get, but you'll get cash and you'll get it right now.

At the same time, the boys on The Street know another dealer someplace else who **needs** some used cars. It is a question of supply and demand, and The Street knows where it's at. For knowing it, and for moving it, The Street gets its piece, which is almost never less than \$100 per car and often a good deal more, especially when they're dealing with some of the higher-priced foreign stuff.

To the dealer Jerome Avenue is a necessary evil. The Street is a necessity for him, and after 29 days of the month in which he can out-haggle his retail, or amateur customers, on the 30th he has to go down on The Street and bargain with the real pros. And he knows he's going to take a beating. The buyers on The Street are so sharp the next time we get into a sticky situation with the Russians we ought to send a couple of them over to negotiate. It is a 3-1 bet they'll come back with everything we want — plus the Ukraine, the Caspian Sea and the parking concession at the Kremlin.

JEROME AVENUE

Photos by J. Barry O'Rourke

They move so fast that once upon a time — as all good fairy tales go, except this one is true — a car came on The Street from a dealer at 8 a.m., and it changed hands five times by 1 p.m. At that point the wholesaler who picked it up for openers had it again in what was almost an instant replay — and paid \$1700 more for it the second time around.

He shrugged, smiled a little, then laughed. "That was okay," he said. "I still made a buck when I sold it — both times."

He laughed again, then he lit a cigaret. They smoke a lot on The Street. Camels and Luckies. Without the filters.

"That one was nothing. We had another one I bought from a dealer, sold it to somebody else, 15 minutes later he sold it again, and then we found out the dealer didn't have it in the first place, it belonged to a customer who changed his mind and didn't want to sell it."

He sits there for a moment, the telephone rings again and he is off, the phone tucked between his ear and shoulder, his tight, expensive slacks up on a grimy desk, his bare feet in espadrilles. He is wearing an imported, neckless Italian sport shirt and a similar cardigan sweater, he is in his mid-50s and he has a good tan, which comes from winters at his place in Acapulco and summer weekends at his estate in Connecticut. He's one of the big dealers here, and they say he does \$5 million a year in foreign cars alone. They also say he spent 1963 in jail for income tax evasion, but he says he spent it in Acapulco. It doesn't really make any difference. He's here and he's swinging, and as far as where he was is concerned, well . . . everyone on The Street has told a tiny untruth at one time or another. Not a lie, mind you. Just an untruth.

He is one of 30 on The Street. They have rather uninspired names like Globe and Capitol and Seaboard and World and Polaris and Auto Buyers and the like, from a physical standpoint the entire scene is singularly unimpressive. They are located either in garages or large stores, all of which are best described as nondescript. With all the money that passes through The Street, little of it is devoted to frills. The buyers and sellers in this market are only interested in the goods and the price. Neon signs and carpeted floors don't matter.

The only thing that does matter is the stuff on the floor.

Right there, sitting next to a clapped-out Ford ("A copperoo," the man says, meaning it was once used by the fuzz; you can tell them, aside from their all-black exteriors, by the extra-large alternators), was a Lamborghini, and on the other side of that there were three Mercedes, one of them a gullwing 300SL. The Street discovered the foreign-car market a few years ago, and it has been even more profitable, on a unit basis, than the domestic stuff. One of the biggest reasons for this is they can often find a domestic-car dealer who's taken a foreign model in trade and has no real idea of what it's worth. Another reason is that the mark-up on the high-priced imports is considerable. They can make \$1000 or even more on a Maserati Ghibli, a Ferrari or on a Ford GT40.

The best of the imports, however, was the Volkswagen. The past tense is used because now that VWs are plentiful through authorized dealers there is no longer a bootleg, or grey market situation. When there was, down on The Street they were swinging. They were actually chartering freighters to bring them in by the shipload, with a little assembly line set up at the German port of embarkation to Americanize the cars by the installation of sealed-beam headlights, safety glass windshields, etc.

Those days are seemingly gone forever, but that doesn't bother anyone here. They're too busy to think about it. Once the doors open in the morning it is a fast and furious cacophony until nightfall, with the Greek (you should pardon the expression) chorus being composed of the bosses, the buyers, the secretaries, the delivery drivers and anyone else who happens along, and what goes on below is all happening at once:

"Hey, you come to steal a couple cars from me?"

(Southern boys, obviously, in clean sport shirts and drawls. They laugh, and wander out to look at the stock.)

"Where's that Pontiac?"

"Tell him this afternoon."

"Did we get a check from Irving?"

"Is it certified? . . . Okay, only certified from him."

(Into the phone) "If you buy two more cars from me that'll

make a trailerload and I'll have them there Saturday . . ."

(More telephone, but another one) "Why don't you keep that car, I'll keep this one and we'll adjust . . . I'll even write you a check now and fight with you later . . ."

"No, convertibles haven't diminished . . . The strength is still very strong . . ."

"Tell the lawyer to send him a letter . . ."

"Send him the papers on the Jag we sold him, the check's cleared."

"That one goes to West Warwick, Seymour."

"There were two guys in here looking for you — I think it's their first time on The Street; they need some foreign stuff . . . They'll be back later . . ."

(Order forms, purchase forms, checks, sales slips — all being written all the time while the smoke curls around everyone's head and the empty coffee containers roll on the floor and the people come and go.)

"You're a dummy . . . Frenchy on 17 . . . Oh Christ, where's Frenchy's car?"

"A heavy piece? I traded 13 pieces of iron for that one, that's how heavy it was . . ."

"Look, I been tryin' to get that car out of his showroom for three days . . . I even promised him I'd sleep with his wife if he'd let me have it. When I get it I'll send it right over . . ."

"\$3650? No, you got to do better . . ."

"Seymour, where are those plates . . . should I send him a check?"

"Yeah, send him a check already."

"Garbage, that's what they got over there . . . Get me Freddy on the phone . . . When's that boat due? . . . No, I just bought an Aero Commander instead . . . You're killin' me . . . Seymour, get me some cigarets . . . No, don't bother, I'll get them myself."

And he walks across The Street, espadrilles, Italian shirts, places in Acapulco and Connecticut. But it is still the same old Street, and he buys the Camels in the same old candy store. Like everything else, it has been there a lot of years.

Like everything except the merchandise.

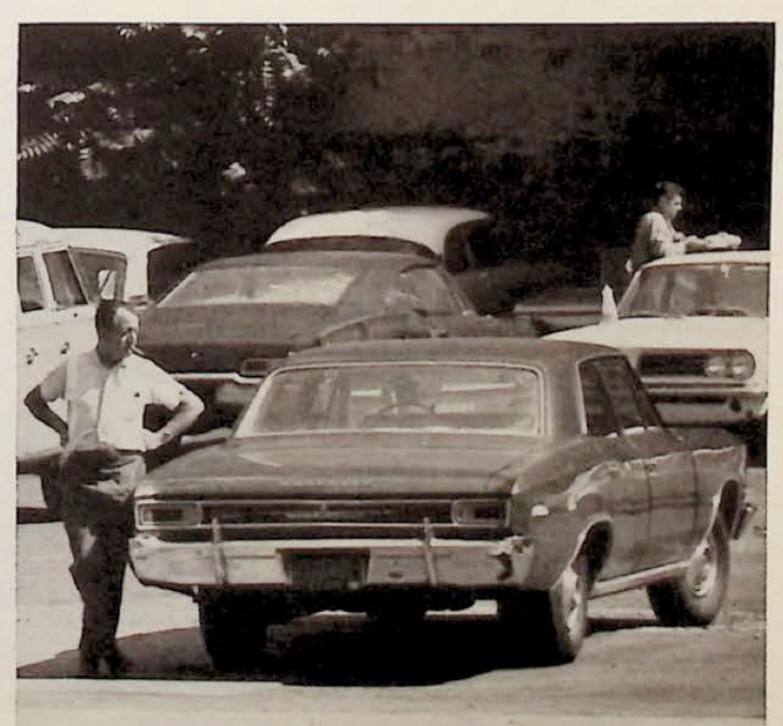
The merchandise. That's what it's all about, baby.

/MT



(Left) Cars are moved on the "Street" by the truckload each day

(Below) Typical lot peeks out from under the famous Jerome Avenue El. (Right) Cigar smoking Jerome Avenue hustler waits patiently for his next prey.



(Above) Three "Streeters" take time for snack.

(Right) "Look, kid, the girls at Syracuse will love it."

by Julian G. Schmidt

King Mover of Motor City

John DeLorean could make any system work. Now, if we could only build one for him out of something less fallible than human beings.

O' Eddie Gibbon should be around today. He'd be a millionaire. Why, right there in the newspapers, gossip columns and even the nation's latest self-adopted truth-sheet — *Newsweek* — is a man-made cast member that could turn the last few chapters of "The Decline and Fall of the Roman Empire" into a third act salvation of eternal bliss.

All Gibbon would have to do is plug John Zachary DeLorean in place of Petrarch or one of his more pathetic predecessors, and, right before your very eyes, thirteen centuries of continental decay would fall sweetly into place.

Of course, in his present position as General Manager of Pontiac Division, John DeLorean has a distinct advantage over the vice-ridden regents of early Rome. Where they were figureheads concerned primarily with power and personal exaltation, the GM board appears to the average citizen as an impersonal entity of unknown beings concerned only with corporate profit and anonymous individual wealth, thereby leaving themselves wide open for someone to gain a firm foothold.

That "someone" need only have all his edges rounded off so he doesn't bruise the exchequer nor snub the premier nor affront the council of elders nor ignore

the populace, but still please the village criers. Most important, he must be beautiful, because being beautiful automatically endows one with powers omnipotent enough to transcend any shortcomings, and, in fact, wring those shortcomings into standards, themselves.

Strategy? DeLorean has it all mapped out, and so far, he's right on schedule. Yet, he has still another advantage. At only 43 years of age and the youngest of division managers, he has a kind of special sanction for contact with the young that is just a little more bold and considerably more swinging than would be allowed for any other division manager.

Whether lip service is paid to DeLorean under the cloistered ceiling of the GM Building's top floor, is irrelevant. Even if they don't realize it, they love him, if for no other reason than that he represents exactly what they are not, but must be, in order to deal with the changing market. Sure, they're still the ideal image for final-decision makers... stable, imperturbable, stoic. But DeLorean epitomizes the ideal tool to insert into the nitty gritty... lots of black hair, 6 feet 4 inches tall, slim, athletic, always with that blue shirt, dark blue tie and incredibly tailored blue-black suit that looks more like someone first built the perfectly proportioned suit, then cast John DeLorean in it. As one of our distaff put it, "... one of those men at whom a girl could sit and stare all day, warmly."

Regardless of what John DeLorean might want to do with it, an image with appeal like this adds that touch of personality that has resulted in Pontiac's boom; it's exactly the technique he will continue to use — and the one that will continue to work. And DeLorean is smart enough to capitalize on it. Everyone wants contact with him, and shop talk is the

"... I usually like to vacation in Palm Beach..." Photos: Pat Brollier



easiest entree. During any one of his frequent strolls through the plant, virtually no one is hesitant to offer a suggestion about the cars.

"I try to encourage this," admits DeLorean. "Any time anyone has a suggestion, regardless of its validity, I like to hear it. Of course, in this business you have to weigh every change against many factors, so many of them cannot be used, but this type of communication is, nevertheless, healthy."

"We try to maintain this especially among departments — styling, engineering, advanced design..." This is no doubt the reason why Pontiac has continued to tally a *tour de force* in design innovations nearly every year since 1959.

This susceptibility to suggestions is understandable from DeLorean's past. He was originally with Chrysler, then Packard, which he lightly describes as being "similar to Czechoslovakia" in administration, though it had a fine

"... I believe the young people will begin to buy larger cars..."



engineering department. Since before he came to Pontiac in 1956 as director of advanced engineering, he has been an innovator. In fact, he claims credit to over 200 patents and applications and was responsible for Pontiac's Wide Track principle and overhead cam six.

DeLorean has a history of being dedicated to proper self-administration in the world of big business. A bachelor's degree in mechanical engineering at Lawrence Institute, and a master's in industrial engineering at Chrysler Institute were still not enough, so in 1957 he was awarded another master's degree in business administration from the University of Michigan. He knows where he's going, and, at present, belongs to 12 of the most proper and influential organizations of his craft.

He also has a convenient personality trait — shyness — which means he naturally keeps his mouth shut when it's supposed to be that way. It also means he thinks before commenting. When asked what part Pontiac is playing in the new Trans-Am Firebird with Jerry Titus up, he dismisses the company affiliation

"... The Republicans seem to be our enemies, and the Democrats our friends..."



completely, even though they "just happen" to be building an engine with exactly a 302-cubic-inch displacement.

But as we said, he has things pegged. Pontiac is supposedly not going racing; nevertheless, DeLorean has an uncanny and intimate knowledge of Roger Penske's phenomenal success with his cars and drivers. DeLorean observes, "Penske is really smart the way he manipulates his drivers. He tells them to go out and break it, they do right from the start, and by the time everyone else catches on, Penske's cars are far ahead. The competition tries to catch up, and before you know it, engines are blowing all over the place and the Penske cars leisurely take the win."

Of course, DeLorean's caution in admitting Pontiac's involvement in Trans-Am is an example of his wisdom. "You don't go into something like this unless you know you're going to win. Yet there's a lot more to it than too many of the entrants realize," admonishes DeLorean. "There is just too much to learn before success comes. In fact, you wouldn't believe how much experience someone has to have in Trans-Am in order to win." Sounds as though DeLorean is, nevertheless, learning, for some reason.

Pontiac's forte has proved to be in the youth market, and DeLorean's ability to establish contact with its more zingy representatives (such as Nancy Sinatra, often seen driving her DeLoreanized Firebird up and down Sunset Strip) might be just what's enabling them to reach that market's vulnerable spots with such accuracy.

If anyone penetrates that market, Pontiac does. "The market is probably through changing into the major segments that have shown up within recent years," says DeLorean. "It will continue to shift, putting more emphasis on various types of cars at various times, but in general, it's stabilized. However, I believe the young people will begin to buy larger cars soon."

The increasing variety and luxury of bigger cars is becoming more attractive." Witness, folks, the Grand Prix.

Shy, deliberate John DeLorean knows how to play it cool. He rejects statements that Pontiac has an intuitive control over the youth market, and, instead, gratuitously leaves that responsibility in the hands of the public. "You cannot control a market. It controls you, and you just have to keep up as quickly as you can."

Quite a quality, that shyness of his. Our visit reached the point where he excused himself, rose and left the room, and a wave of guilt wafted over Miss Ellen Merlo (who accompanied me on the interview for reasons which are obvious after viewing John DeLorean) and myself for causing him some discomfort.

He is a polar opposite to the stereotyped unrefined, hyperaggressive, egotistical chief executive that is normally

"... I definitely think the powerplant of the future will not be electricity or steam, but turbines..."



necessary for lifting his company out of a morass of competition into the hottest of the lot. Yet at the same time, DeLorean is very proper among Detroit executives. "We in Detroit vote Republican," but confesses, "They nevertheless seem to be our enemies, and the Democrats our friends. When the Republicans are in power, they threaten GM with the anti-trust suit, but as soon as Democrats come in, they drop it. Yet, somehow we keep voting Republican."

On Presidential candidates, he feels that, "... both Nixon and Humphrey are two of the most intelligent candidates we've had for some time, but they don't have any color."

Ellen, the world's most flaming liberal, suggested Wallace... he has color. He also has the anathema of Pontiac's public relations department ever since he bumped DeLorean from the cover of *Newsweek* (both had been interviewed for that issue).

With Pontiac's strong suit incontestably in control of the youth market, it's easy to understand why DeLorean also disdains extensive research in another kind of propulsion; namely, electricity and/or steam. Yet at the same time, he's not at all reluctant to declare, "I definitely think the powerplant of the future will not be electricity or steam, but turbines."

Business may be essential, but DeLorean is still basically an automotive enthusiast,

though perhaps more so in image and life styles than in possessions. He is in contact with the grit of racing, or he wouldn't know what he does about Penske's strategy, but on the other hand, he has no "enthusiast" cars of his own — only Pontiacs — and that Maserati Ghibli that is an ideal element in the DeLorean mystique, is a Pontiac Division research car, purchased as a study lesson for engineers and designers.

All of which makes John Z. DeLorean a "very proper swinger," which, in the eyes of the GM board, is exactly as it should be. For the ideal vacation spot on the ideal weekend, he sacrifices the vulgar but visceral swinging of traditionally notorious spots for — not Vegas, not Acapulco, not Monte Carlo or other Rivas — but *Palm Beach, Florida*. (And Palm Springs, Calif., is runner-up!) Palm Beach?! What's at Palm Beach??? We-e-ll, we all know what's at Palm Beach, don't we? There is plenty of golf at Palm Beach. There are board members at Palm Beach. There are board members' wives at Palm Beach. And King Mover is at Palm Beach.

But then, for a swinger who must remain fashionable among the Detroit elite, DeLorean at least knows the limits of discretion (not everyone is aware he's getting a divorce) and, for that matter, the limits of his own ability to cope with New Morality hedonism... if he doesn't indulge in it, he won't expose his vulnerabilities, and every red-blooded American will continue to love him.

No, John DeLorean has no enemies. Enzo Ferrari, for instance, has enemies, but Enzo Ferrari also has the style, character and color of Enzo Ferrari. He does his own thing and makes it, and as a result, he is both loved and hated, even though he is loved and hated with passion.

John DeLorean, on the other hand, is hated by no one, and those that love him, do so with reason rather than with passion. But he, too, has style, character and color. They may not be all John DeLorean's, but they certainly do the job. /MT

"... You don't go into Trans-Am unless you know you're going to win..."



'69 European Style

For Europe's new model year, a restyling job means to go all the way. But there is something they've learned from the U.S.; namely, if you don't restyle, just turn the existing model into a few "specials," and sell it for its gimmicks and performance.



Jaguar's new XJ6 sedan is shockingly more tasteful and elegant than any recent luxury car designed in England and its Italian looks put down even such eminent stables as Maserati and Iso. It's all new (though still with traditional 6-cylinder engine at present; new V-8s are due soon); with new suspension, rack-and-pinion steering, longer deck and low, sleek silhouette. Interior is more posh than in past, but it's also more informative. Dash is paneled with same walnut, but with more instruments and switches, à la XKEs. Upholstery is all leather.

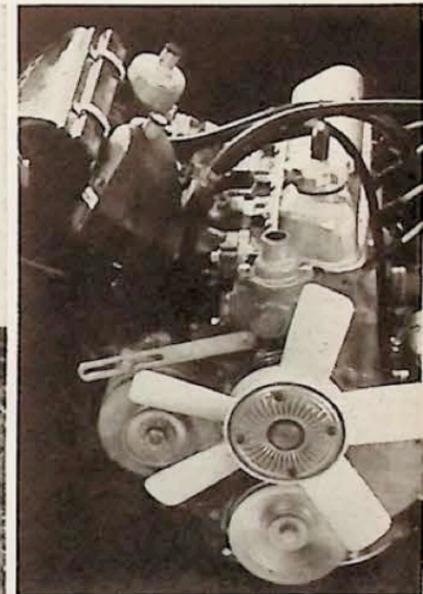


(Left) Simca has taken the existing 1501, added headlights, a sports-type steering wheel, some thin stripes on the side, tweaked the engine somewhat and now calls it the "1501 Special." It cruises at 100 mph, which is about 7 mph faster than the standard version to put it into the now-fashionable high-speed tiny-car classes that are growing in Europe. (Above) Simca's 1000 "S" is a bomb. It screams comfortably at a good 90 mph.



(Left) Germany's Fords. At left is the Escort, engineered in Great Britain and built in England, Belgium and Germany as first "real European" Ford. The 17M, center, and 20M, right, were restyled because of public dissatisfaction with previous Coke-bottle look. (Above) Escort is also available as a station wagon, and even with an automatic transmission.

(Right) Volvo's 144 is now called the "B-20" version when equipped with a (far right) 2-liter engine, bored out from the old 1800. Up front is a new ventilator. Thermostatically-controlled induction-air is preheated at 30° Centigrade. (Below) Volvo is also going all out to bore into the medium-priced sedan market with the posh, new Model 164. It is spacious and super-soft inside, and is designed for comfort and durability, above all. As seen from interior shot at bottom right, rear seat leg room has few peers. Front bucket-type seats are fully reclining with fine support.



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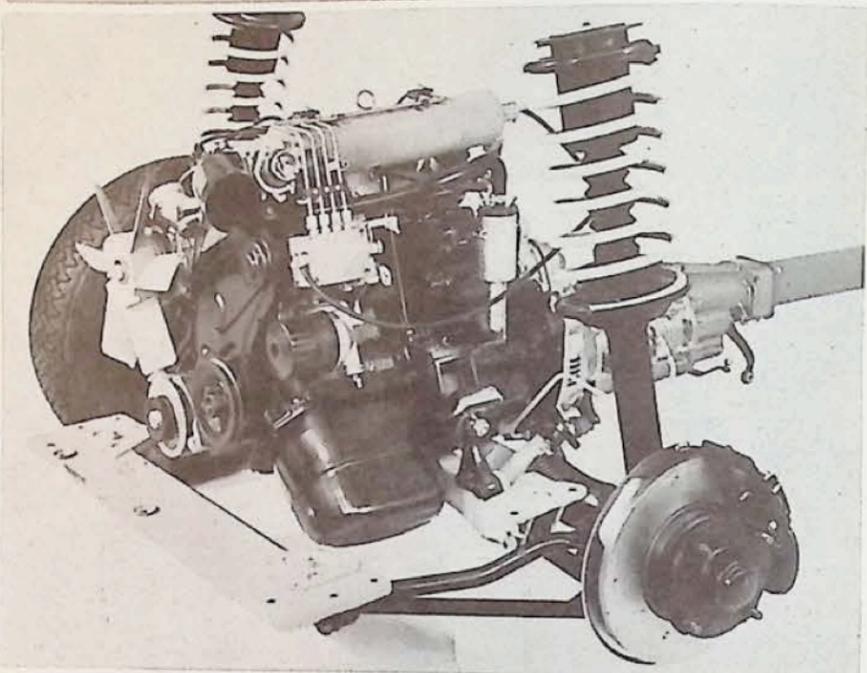


'69 European Style

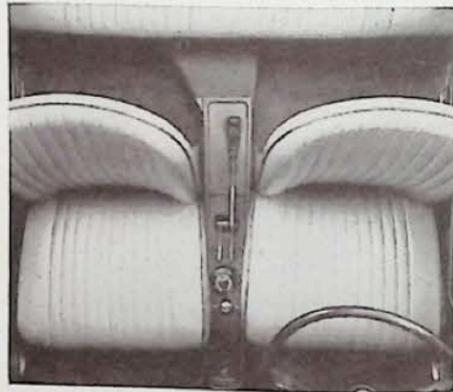
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Peugeot has added superb styling with a French-Italian flair and trapezoidal headlights to the already mechanical excellence of the 504. It uses the contemporary long hood-short deck mode. The same rectangular-trapezoidal effect is carried throughout the interior. Suspension is now independent at all four wheels. Engine is canted and provides better balance and space utilization. Front seatbacks recline, headrests are built-in and adjustable.



Fiat 500L stands for "luxury," that is, as much luxury as one can achieve in a 30.5-inch mini-car. Nevertheless, this mobile button will still hold four passengers, with more leg room in the back seat than most so-called 2+2 GT-type cars, regardless of their price. The 500L's seats have been redesigned to fit lower, and are now adjustable to accommodate a 6-footer. New bumpers have also been added with anguiform nerf wrap-arounds. Map "boxes" are in each of the doors.



Porsche continues to alter and modify models, somehow making the best even "better." Their favorite "tinker-toy" is the 911S, which they have now fitted with fuel injection to give it 185 hp and a top speed of 140 mph. The Porsche suspension, of all things, has also been reworked with a hydropneumatic adaptation for the front. Fenders have also been widened, giving the car a more meaty appearance, and one that adds about \$3000 to appearance, but not price.

GM

MARK OF EXCELLENCE



The Sleeper Awakes

'69 Chevy Nova SS. Up and at 'em!

Louvers on the front fenders, a bulging hood and a throbbing exhaust note let people know this one's no imitation.

Backing up a standard 300-hp V8 is a muscular foundation: special suspension, an extra-tough

clutch, red stripe wide ovals on 7" wide wheels, a special 3-speed and power disc brakes.

The '69 Chevy Nova SS, the car that woke up swinging.

Putting you first, keeps us first.





AC SPARK PLUG DIVISION
 AC builds more parts for more cars
 than anyone else in the world.



Read why AC's new ACNITER Spark Plug is standard equipment on 1969 GM cars.

The new AC ACNITER Spark Plug features a built-in resistor close to the firing gap. It meters the energy stored in the spark plug and delivers it to the firing tip when it does the most good.

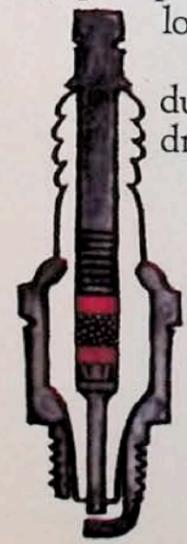
The effective spark improves ignition for faster, easier starts. It smooths out the engine during idling and stop-and-go driving, and guards against power loss in passing situations.

Metering the energy also lengthens electrode life, for prolonged full power performance.

Dirty spark plugs are a major cause of power loss and poor gasoline mileage. Dirt and deposits are built up during short trip, stop-and-go driving. They can bleed off so much current that the spark plugs misfire.

The new AC ACNITER Spark Plug features an exclusive hot tip design. The thin, recessed insulator heats up fast enough to help burn away deposits.

The firing tip stays cleaner, longer, to give you better en-



gine performance on the toughest trips you make—short or long.

Multiple firing edges

ACNITER's knurled center electrode provides multiple firing edges. So you get better ignition at all speeds, under all driving conditions.



Better highway performance

ACNITER's clean tip helps your car run better on the highway, too.

Dirty spark plugs are more likely to misfire at high speeds and during rapid acceleration. The ACNITER thin tip gives you another important benefit at highway speeds: it guards against engine-damaging pre-ignition.

Pre-ignition occurs when the insulator tip doesn't cool off in time for the next fuel charge. Instead of burning at the proper time, the gas and air mixture pre-ignites. It could cost you an engine.

AC's patented insulator tip cools quickly for full

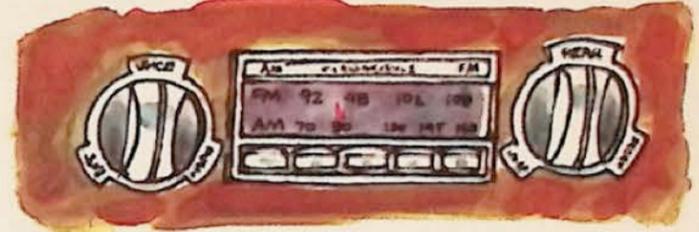


AC KEEPS YOUR CAR IN

AC ACTION

Improves radio reception

Anytime an electrical spark is produced, radio signals are also produced. These signals cause static interference, a major problem for modern communications.



ACNITER's built-in resistor screens out a large portion of the static caused by electrical sparks. This improves reception on AM, FM, and FM-stereo car radios.

But the most important benefit is that widespread use of new ACNITER Spark Plugs will help clear up valuable radio frequencies which are vital for space age communications.

Standard equipment in new GM cars

AC ACNITER Spark Plugs will be original equipment on 1969 General Motors cars: Chevrolet, Pontiac, Oldsmobile, Buick, and Cadillac.

Next time you tune your car, get new AC ACNITER Spark Plugs. They give you more go when you really want to go!

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

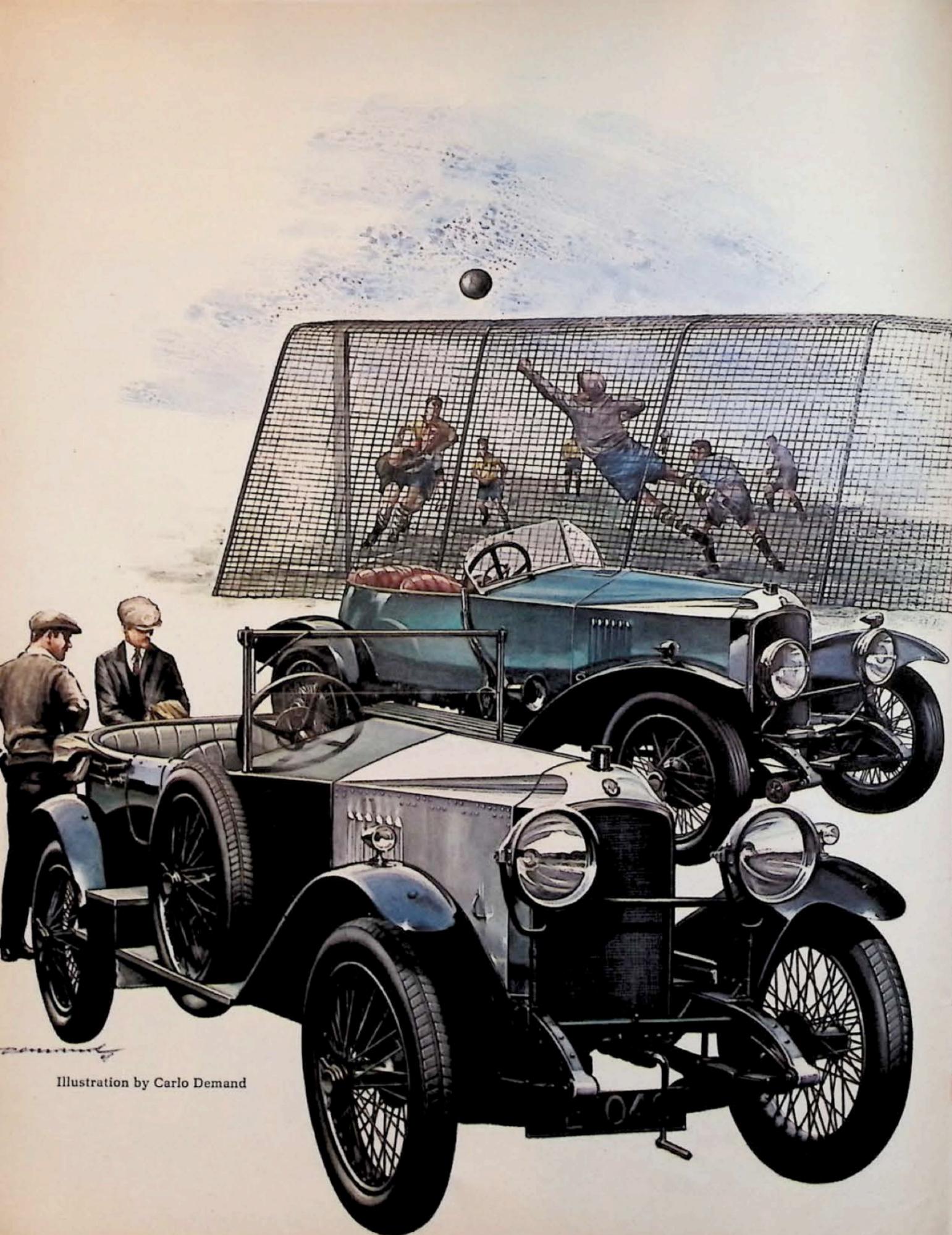


Illustration by Carlo Demand

THE 30-98 VAUXHALL

by Ralph Stein

A direct descendant of the "Prince Henry" Vauxhall, named for the Prinz Heinrich Von Preussen "tours," it was the first British sports car.

In the late Twenties the OE 30-98 Vauxhall was to the Bentley what the Stutz Bearcat was to the Mercer Raceabout in the pre-World War I days — each had its dedicated protagonists quick to proclaim the virtues of their favorite marque — and they tended to wax pretty hot about it, too.

In a way this wasn't quite cricket. For the Vauxhall was on its way out (General Motors bought out the name in 1925) just as the Bentley was coming into its own.

This 30-98, the last of the real Vauxhalls, was the direct descendant of an earlier machine — the "Prince Henry" Vauxhall named for the Prinz Heinrich Von Preussen "tours" which were high-speed rallies organized by the German Kaiser's brother and which started in 1908. A 3-liter Vauxhall first entered one of these events in 1910 but failed to win (an Austro-Daimler won that year). Anyhow, the next model of the Vauxhall with a 4-liter engine was given the name "Prince Henry Type" even though no 4-liter model ever ran in the Prince Henry Tour.

The rather antic Prince Henry Tours — since they were often more races than tours — caused the development of a new kind of car — the sports car. The 1910 Austro-Daimler was perhaps the world's first sports car and the Prince Henry Vauxhall was without a doubt the first British sports car (although the term "sports car" would not be applied for years to come).

The 4-liter, 4-cylinder (70mm x 95mm) Prince Henry had a side-valve engine which developed 75 hp with a 3:1 rear end ratio and would do 60 mph at a mere 2000 rpm. Its top speed was

75 mph — reasonably quick pre-1914. The car was delightfully easy-running and easy-steering as I discovered when the owner of a 1914 model — the late, great motoring journalist, Laurence Pomeroy, Jr. — took me for a run (his father had designed the car). At 60 it just floated along. It steered to an inch with no effort. The lightness of its handling was due, partly at least, to its low unsprung weight, since it had no front brakes and light, skinny tires on big spidery wire wheels.

In 1913 "Prince Henrys" won 23 races at Brooklands track in addition to winning 35 hillclimbs.

By 1913, however, six prototypes of what were later to be called 30-98s appeared, but production of this new model didn't start until 1919. These, the E-type Velox 30-98s, were so called because their R.A.C. rated hp was 30 and their actual hp was 98. They still had L-head (75 x 150mm) engines and single Zenith carburetors. The OE 30-98 (O for overhead valves) arrived in 1923, but, despite Laurence Pomeroy Sr.'s desire for an overhead-cam design, the valves were operated by pushrods because of the wishes of a tight-pursed board of directors.

Pomeroy left for the U.S.A. to design an all-aluminum automobile for Alcoa, whose directors also turned out to be chicken about that revolutionary car.

The first OE 30-98 I ever saw (in 1931) was for sale by the legendary Ray Gilhooley, that pioneer New York vendor of used exotic motorcars. This one had a bright, polished aluminum roadster body built, I believe, by Derham of Philadelphia. It had, I heard, been fitted with a new engine from the factory after its owner had run it into a stream and somehow blown its first engine by allowing it to suck up water through the exhaust pipe. Four of its wheels had been cut down to take faster tires, but the wheels in its twin fender wells were still original. My

brother and I were fascinated and excited by the lovely machine. Its steering and performance seemed wonderful to us, whose previous experience was mostly with the new Model "A" Ford roadster I owned. After all, the light 4½-liter Vauxhall put out 120 bhp. Although its quick one turn lock-to-lock steering took a bit of learning, it was beautifully precise as was its 4-speed crash gearbox. Its brakes were even worse than those on my Model "A."

I still regret not buying the Vauxhall in spite of Gilhooley's exorbitant price. He wanted \$150 plus my Model "A," say, \$450 all told. Furthermore, my father didn't like the Vauxhall, "It's dirty in the corners," he said, meaning that there were small accumulations of greasy dust in various crevices. I wish now he hadn't been so damned neat.

Gilhooley maintained that the mechanical 4-wheel brakes merely required "taking up," but I later learned that 30-98s were notorious for poor stopping ability. The almost useless front-wheel brakes were operated by rods and cables from a "kidney box," a makeshift contraption sitting down low in front of the radiator. The maker's lack of confidence in them was evidenced by the instruction book: "Should it become necessary to check the car's progress," it warned, "the handbrake is the correct brake to use, the foot-operated brake being in reserve for emergency." A few later OE 30-98s had an early type of hydraulic braking.

That OE 30-98 which I didn't buy was acquired in the later '30s by a chap who decided to rebuild it. Years later I saw its disassembled parts lying dustily forlorn in a garage. The man who owned it died. But a few years ago its bits were bought by an enthusiast who now, I hope, takes it out on the road now and then to thrill drivers of Michigan-built road appliances with the virile bellow of its exhaust. /MT

(Above) OE 30-98 Vauxhall with "Wensum" body. Note "kidney box" for 4-wheel brakes between goose-necks. (Below) Two-wheeled braked 30-98 Vauxhall. Fluted radiator shell and hood were later copied by Chrysler Imperial.

The Greatest Road Race Ever Held

by Robert Fendell

Participants in the 1908 New York to Paris race also braved death—by attacking wolf packs in the wilds of Utah, by barroom brawls in Siberia, and by nose-to-tail dicing through mud sloughs.

Late in January, 1908, a young German Army lieutenant named Hans Koeppen rode down Berlin's Unter den Linden waving farewell to thousands of cheering Germans. He was on his way to Hamburg and the boat to New York. Minutes before he had told the newspaper *Zeit am Mittag*:

"Our trip is a sporting trip. It has no military backing but much military significance. I think it will do much to establish the motor vehicle in military strategy."

Meanwhile Chauncey DePew in the U.S. Senate and the *London Daily Mail* were editorializing about the same event—New York to Paris the hard way—by car. The British paper wrote:

"The stupendous undertaking of a trip around the world in an automobile is a veritable romance. Is such a

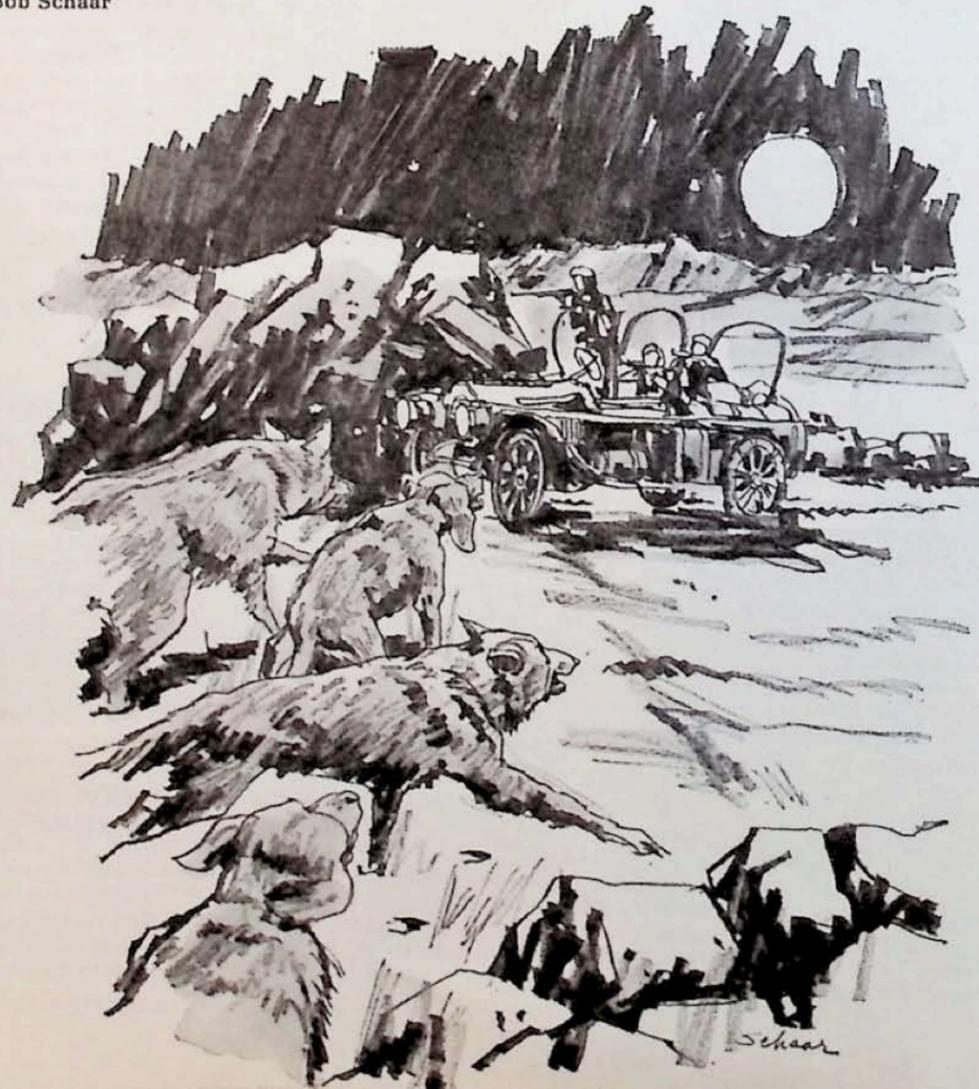
journey possible? Theoretically, it is, but it must be borne in mind that the motor car, after woman, is the most capricious thing on earth."

This was the background against which the immortal New York to Paris automobile race was organized, a race so charged with charm that it is perpetually resurrected by major movies, numerous books and articles (each time with a different treatment as you see here), and a living-color space-age 60th anniversary commemoration of the race that was recently done by a group of buffs who drove their antique cars coast to coast this summer, over freeways and through traffic jams.

February 12, 1908, in Times Square was a sunny day. Snow covered the streets but it blocked neither traffic nor the

continued

Illustrations by Bob Schaar



(Opposite) As the dark shadows of Evanston, Utah, faded behind, the Zust members heard an eerie wailing, and looked around to see themselves surrounded by wolves. A river ahead required fording, so they thought it best to stop beside a boulder and have the showdown. Crouched behind a pile of equipment on the car, the three men saw the wolfpack ring the car in tightening circles. They fired and two of the animals screamed and fell wounded. Immediately the rest of the pack tore the injured wolves apart, fighting for the remains. Through the night, the men fired into the pack, and finally by dawn, the wolves left their dead and loped for the distant hills.

(Above) Many times on all three continents, streams had to be forded and swamps had to be navigated. Several times it was done with the aid of horses, most often by manpower, but once the Americans' Thomas sacrificed a several-hour advantage to pull a competitor out of a deep quagmire. (Below) The Thomas, Protos and Zust decided to ride the tracks of the Trans-Siberian Railroad as the only feasible way across Siberia. A Russian railway captain rode alongside the driver. At each military outpost their papers were examined and they had to search for precious gasoline, often finding it only at the druggist after hunting for several hours.



The Greatest Road Race Ever Held

continued

100,000 New Yorkers who gathered near the 43rd St. starting line to see the six automobiles which had been selected from a welter of preliminary entries to make the run.

There was the German Protos, the Italian Zusto, the American Thomas and three French cars — Motobloc, de Dion and Sizaire-Naudin. All had open touring bodies, strictly stock or reinforced chassis and acetylene lamp headlights. Top speed varied up to about 60 mph but there was no handicap system since in the dead of winter few open stretches were likely. In fact, the proposed 23,600-mile race would be largely over unbroken land.

Favored was the de Dion, built by the Marquis who lent his name to a type of suspension. It was a 6600-pound monster with 4-cylinder 30-hp engine. Its iron frame was covered completely by felt with a rubber overcoating to protect it from the bitter cold expected in Siberia and Alaska. It boasted solid rubber tires studded with steel, spares with small spikes for ice and special rims for riding on train rails. It carried 154 gallons of gas in seven tanks inside the car and along its running board and in the back the tools, spare parts, guns, piles of winter clothing, picks, shovels and block and tackle were strapped and roped on.

The Protos was the first to arrive in Paris, but three days later, the Thomas rumbled down the streets, claiming the victory because of a handicap it was given after being unfairly detoured before crossing the Pacific. This time the crowds were ecstatic, cheering and

The comparatively tiny one-cylinder Sizaire-Naudin was nearby as was the Motobloc, equipped with radical cushion tires made with multiple interconnecting air chambers. The German Protos was the largest, a 40-hp, 4-ton vehicle loaded further with six sets of tires, tools and equipment. The 30-hp Brixie-Zusto boasted pneumatic tires and looked more like a bakery wagon with its square-roofed body.

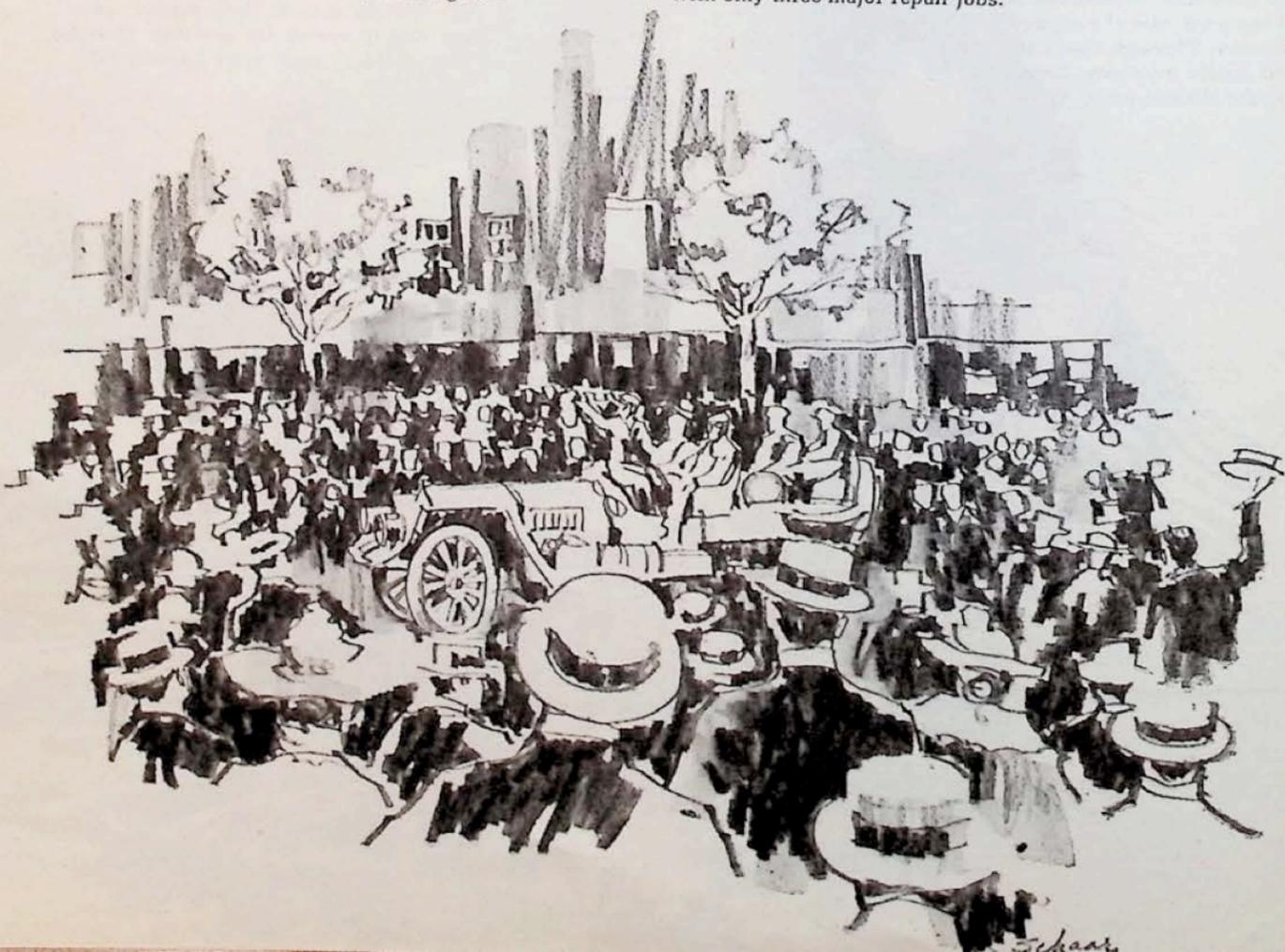
The American Thomas at 3600 pounds and 60 hp was the best from a power-weight ratio. A 24-year-old Jersey racer named Montague Roberts would drive the car to Denver. Also in the car were George Schuster, who would drive the remainder of the distance beyond Denver, a 21-year-old named Harold Brinker, and George MacAdam, New York Times writer.

Mounted police forced the crowds back as the stand for dignitaries filled just before race time. The pilot cars were in position, the contestants ready and Colgate Hoyt, American Car Assoc. president, was looking at his pocket watch, starting gun at the ready.

At 11:14 a.m. he fired the pistol and the six were on their way at 15 mph up Broadway, perhaps the biggest road they were to see for months. So began the longest auto road race of all time.

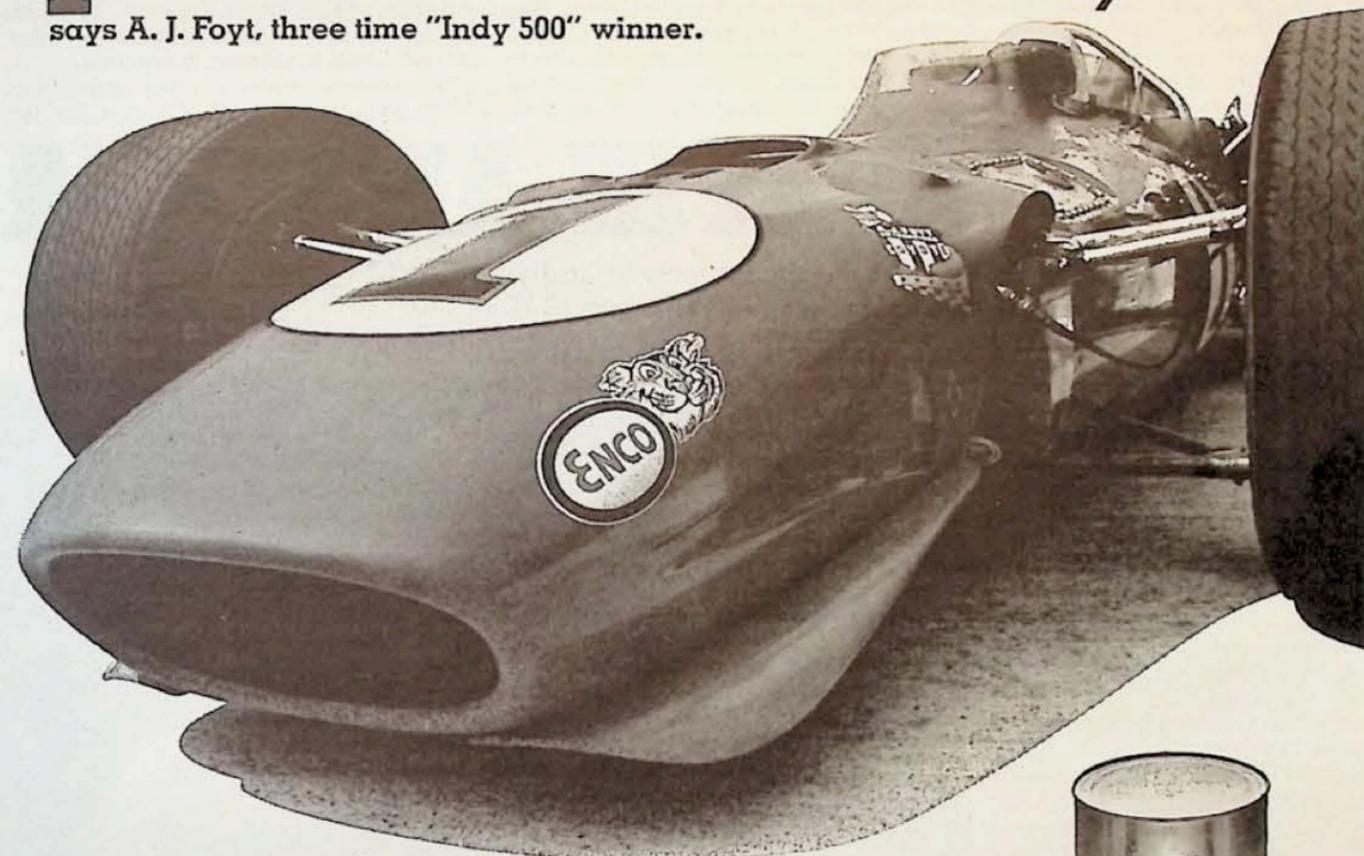
/MT

screaming "Vive L'American" as they threw flowers at the Thomas crew. The editor of "LeMatin" kissed the begrimed winners on their cheeks, after they had made the trip at a cost of close to \$100,000 in 170 days with only three major repair jobs.



"Uniflo is the closest thing yet to a perfect motor oil,"

says A. J. Foyt, three time "Indy 500" winner.



As a builder of finely tuned racing machines, as well as a top racing driver, A. J. Foyt knows the importance of wide-ranging engine protection, not only for racing cars but in passenger cars as well. In fact, such protection is even more important in your own car, particularly at very low temperatures. This is why Uniflo 10W-40 is the "closest thing yet to a perfect motor oil." It gives remarkable low-temperature protection for easy starting, yet stays on the job no matter how hot it gets. Uniflo 10W-40 is not a racing motor oil. It's an oil for the car you drive every day, and it will protect the engine in every different climate at any and every time of year. What's more, with

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So there you are in England, at British Motors Corporation, which is now British Motor Holdings, Inc., looking west across the shrinking Atlantic River and realizing that something like the Volkswagen phenomenon is kind of a backlash against our old serene, arrogant nationalism and hoping it can be used to grab a slice of an annual 9.5 million new-car Yankee pie. Now BMH knows the Beetle is a pretty good little machine in its own right, but they also know its shortcomings and, more important, that the old buy-American-regardless syndrome, still commands a sacred spot in the U.S. citizen's heart next to mom, apple pie and common sense. The plan according to BMH then, is to select an appropriate car for the American market, load it with American features like a real automatic transmission and put an American name on it. America, this is the Austin America.

But the BMH people weren't dum-dumies, they knew they couldn't take on VW headlong, so they took on Rolls Royce headlong. If it's good enough for Ford, it's good enough for BMH, and besides RR is not going to fight back. Who cares if anyone claims the \$1895 Austin America has more leg and headroom front and rear than the \$20,000 Silver Shadow. The real coup is that the Austin America is designed as a second car, sec, not a first. The inherent wisdom of this logic means: (A) Austin owners at least by inference have sufficient capital for two cars so you can, for the first time, have forward and reverse status simultaneously (VWs have only reverse status); (B) since the VW has been offered more on a first-car basis, if the America falls short of the Beetle in some ways it is, after all, only a second car; and, if in others it is equal, then it is actually better because you don't expect it to be equal.

To find there really is an Austin America after all the psychological footwork is nearly an anti-climax—almost, but not quite. If you know what a MG 1100 sedan is, then you know what an Austin America is except the grille is different, the tires are slightly larger, the engine has 175 cubic centimeters more (1275cc or 77.9 cubic inches total) and there's an automatic transmission—that's important. Up to now, Volkswagen has been almost alone in total uninvolvedness in Detroit's tri-year sheetmetal derby. Yet the America doesn't have to worry either, since its design sprang from Britain's Alec Issigonis who saw a vast market in basic transportation and realized we were slowly crushing ourselves to death in the standard metropolitan areas of the globe with large-sized vehicles. Space, that's the premium today, people. Piddle away even

one single foot and then we all are losers. Issigonis' primary shock to the traditionally stagnant automotive industry was the Mini that revolutionized British motoring. North-south powertrain concepts were out, east-west were in. With the engine crossways in the front, straddling the transmission and differential, you paid yourself the flat floor bonus plus the unique option of attaching almost any sort of body you want without hassling a new drivetrain. The old, big wheel concept is also out because large tires use space that could be given to the passengers.

The Austin America has 12-inch wheels and all the other Issigonis magic, which means a one-inch shorter wheelbase than

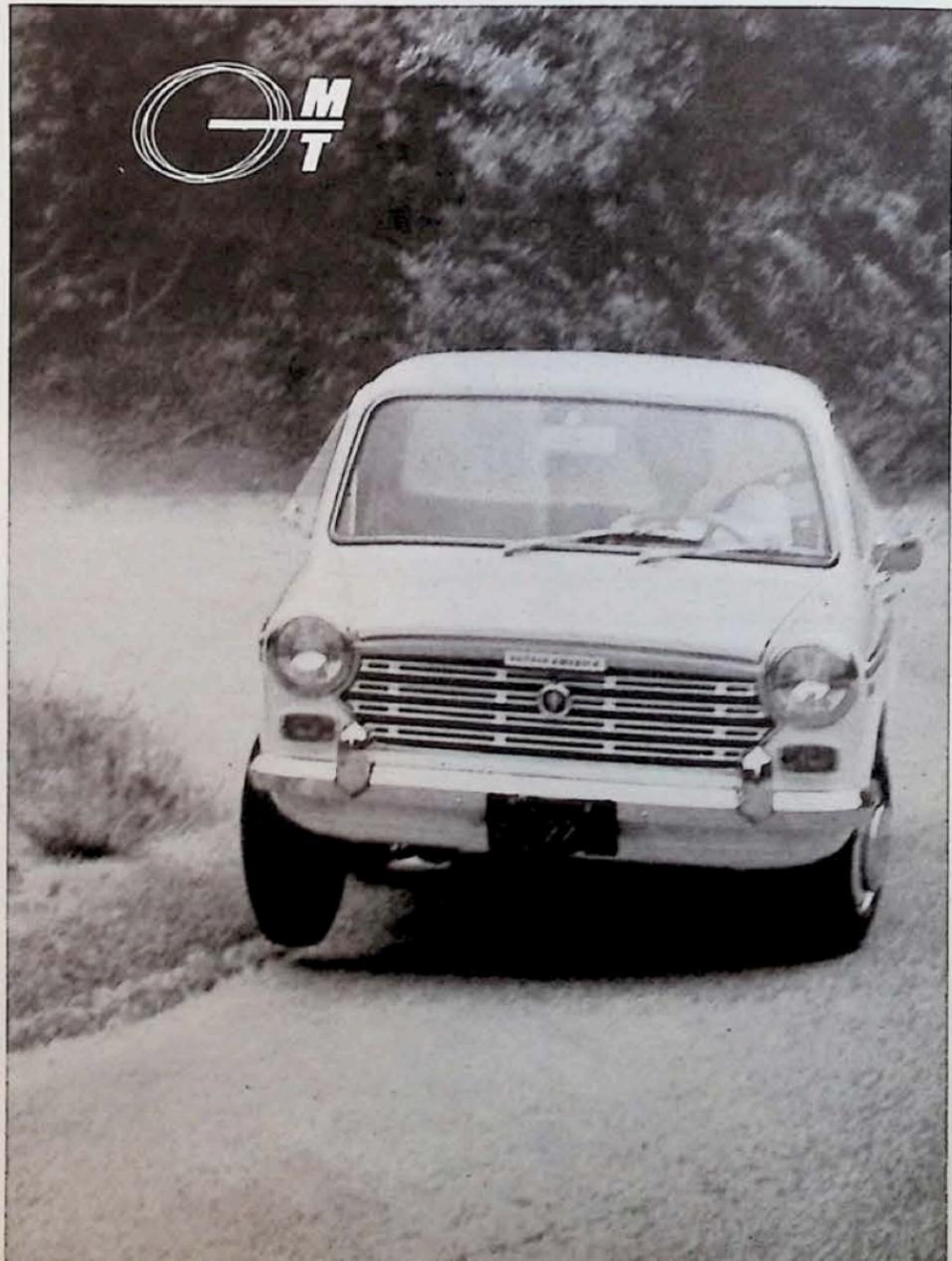
the VW (93.5 vs. 94.5), over a foot less length (146.75 inches vs. 158.6 inches), nearly equal widths (60.38 inches vs. 61.0) yet a perceptibly larger interior seemingly more roomy than even, say, a Camaro, especially in the rear seat. Would you believe Silver Shadow? Then, there's 9.5 cubic feet of trunk room, identical to the deflated Space-Saver spare-tire-equipped Firebird, but designed upright with flat sides so that real suitcases will fit. It is hard to grasp that an entire Austin America will fit inside the shell of a number of Detroit cars yet actually have almost identical usable interior dimensions.

Impressions snap at you quick fire when you leap into an America for the

AUSTIN AMERICA

Build a better mousetrap and you've still got a mousetrap. The trick is to catch a bug in it.

Text and photography by Eric Dahlquist



first time. The steering wheel rim is too small, making it hard to grasp. And the seats seem rather tiny, too—overstuffed—not at all like those throne room jobs used by Volkswagen. It is immediately apparent that the Austin driver lives in a glass house, not because of the rear-view mirrors that vibrate the world into a warm blur at anything over 50, but straight up, big windows. The plastic-mounted mirror is a small example of major fault of the entire car, some items are very cheap. Take the carpets. They are deep pile and look very rich but are poorly anchored and the nap was already worn off around the accelerator in only 2000 miles. The detailing is edgy. Virtually every accessible nut and bolt in the car was a quarter to a half turn loose and the intake manifold nuts were finger tight. Fortunately, a standard 1/2—9/16-inch combination end wrench fits almost everything on the car; slight compensation as you work from front to rear remembering how you never had to do this on a Volks.

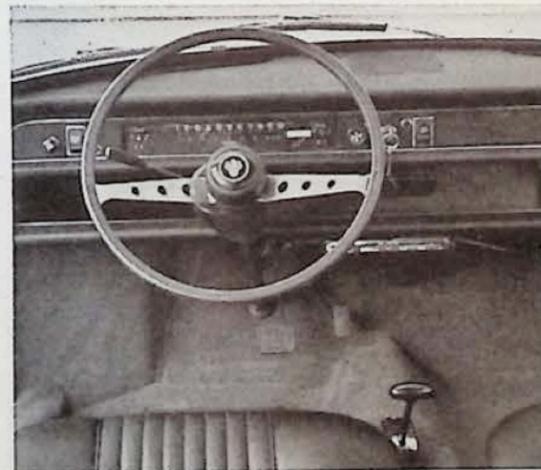
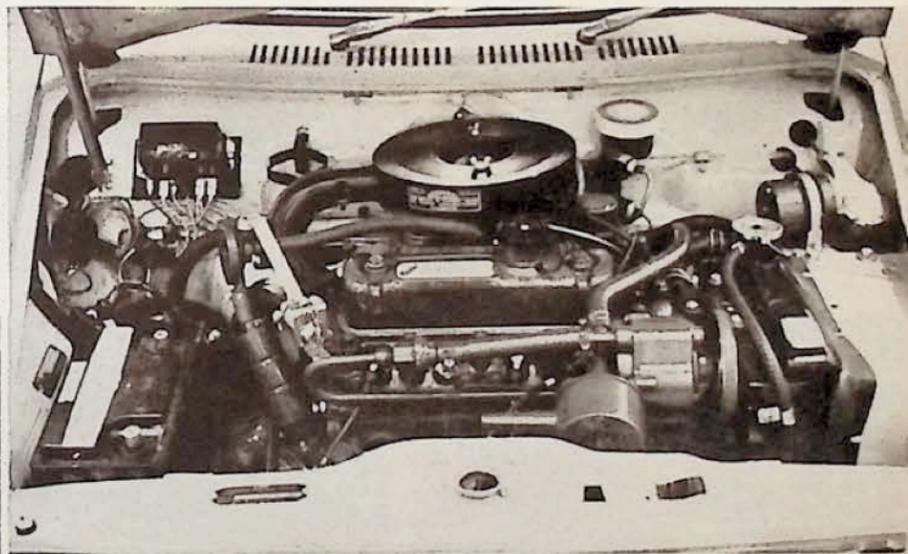
Driving the America is a compact riot. You sit low looking out over the precipice of that abbreviated hood and the pavement is an on-rushing gray blur sweeping under the wheels. The feeling of sheer speed is fantastic especially at night, threading through traffic. Maneuverable? You bet. It's better for congestion relief than Dristan. The suspension is the now famous Hydrolastic liquid-type coupled in front to independent upper and lower levers and rear to trailing arms. Inter-connected front to rear, liquid-filled rubber bags act as shock/coil units and allow a very stable ride because the back wheels know what the front ones are doing and vice versa. In a 93-inch wheelbase car you expect freeway hop and you are not disappointed though the amount is surprisingly low and the suspension is great in smoothing the cobbled streets.

With the advantages of front-wheel drive comes the penalty of about 60% of the total vehicle weight on the front wheels and old admonitions about keep-

ing the car in shape in the corners by keeping the throttle glued to the mat. It works. If you get too exuberant, you'll oversteer yourself off the road because the Dunlop C41 6-ply tires could use more footprint, but power-on is the idea; except for one detail. Most other people do not have front-wheel drive, so just about the time you go blasting through a neat turn, everyone else is letting off and you have to let off too, making your tail slide out slightly, while theirs is tucking in. The Austin America goes where it's pointed, is almost unaffected by crosswinds and provides all that lovely space though a measure of the fun of having front-wheel drive is lost by default. Besides that, now that the bug has true independent rear suspension like the Porsche, you can't put a train length on them in the esses anymore.

The 2.78- by 3.2-inch bore and stroke engine is a variation of the A series Austin introduced in 1951 at 803cc. By boring a little here, stroking a little there, clipping the head a bit, improve-

The America way around corners borders on fantastic. Austin A30 engine (right) is the British equivalent of 327 Chevy. 58-hp powerplant is sufficient to down almost all Beetles. 1275S Cooper parts give potential of downing almost everything. Interior (below) is space-saver of the year. Instruments are very precise English, easily read and, unfortunately, too few. Four-speed automatic is one of best built. Rear seat has fold-down armrest, more head and leg room than '69 Buick 4-door. Any way you look at it (below right) AA wins.



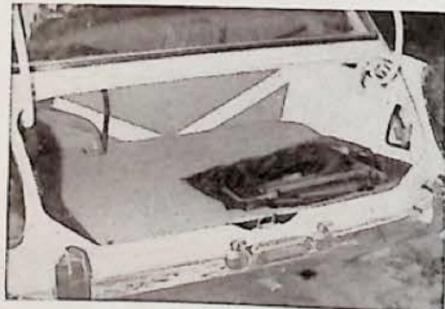
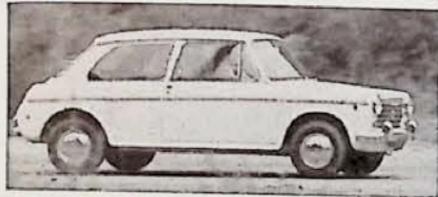
AUSTIN AMERICA

ments have escalated horsepower from 28 originally to the America's current 58 @ 5250 rpm, a 100% jump. Of course, you do not have that familiar Beetle roar following you around, you have an Austin roar in front instead. Appropriate amounts of sound deadener would probably stop the hydro-electric plant hum.

Still, the most intriguing aspect of the power unit is the Automotive Product's 4-speed automatic transmission that is situated in what would be the oil pan of a normal engine. It is really a beaut, the true automatic stick shift, allowing either individual gear selection or the pre-program of big D (drive). With over 100 pounds less heft than the VW (1852 vs. 1985 pounds) but down 13.7-inch displacement, the America will swat any automatic bug at the light and a lot of the unmodified sticks, too. A 1.4-second-quicker-to-60-mph-advantage (20.6 seconds vs. 22.0) is impressive, especially in the passing lane. The transmission will shift automatically at 28 mph, 42 and 58 with an overall top speed around 83 mph. The Automotive Product's transmission is one of the most advanced units yet made for small displacement engines and far superior to the Beetle clutch torque converter arrangement that has no automatic kickdown. Manual shifting and vigorous driving, though exhilarating, consistently lower gas mileage from 25-26 mpg to 22.

Braking has never been a VW forte (41 feet from 30 mph, 145 from 60) and with 8-inch self-adjusting discs front, 8-inch drums rear, the America needs nearly 31 feet less space to halt from 60 mph. They are not above criticism however, often feeling spongy, occasionally leaking fluid out of the master brake cylinder and not as predictable as some others like the BMW 2002 or Peugeot. Stopping in a straight line is also dependent on precise tire pressures.

To the surprise of no thoughtful person the Austin America will not capture sales leadership from the bug, even with a \$67 price advantage. It's this way, VW like Chevrolet has plenty of dealers, good, fat happy dealers, so they have everybody covered by numerical superiority alone. Then too, the people at BMH are going to have to cut out the third tea break and start making sure the cars are put together properly; after that, they might concentrate on adding a larger steering wheel rim and radial-ply tires for stronger grip, and longer wear. And how about a little bit better fresh-air ventilation? VW's isn't much good either but that's no excuse. Look guys, it was a nice try, you've got a great starting point in the



Trunk space (above) equals or exceeds most pony cars but is designed to hold suitcases the way they are designed to stand — upright. America's top speed is 83 mph and will breeze along unstrained (top) at 75. Rear suspension is trailing-arm with Hydro-lastic displacers interconnected front-to-rear. Liquid suspension, you see, makes small cars ride like big ones. There are front-wheel drives (left) and then there are front-wheel drives. The Austin's works. Eight-inch self-adjusting front disc brakes stopped car from 60 mph in just 114 feet.

Austin America, it's head and shoulders above the old Beetle but the details are killing you. Years ago, when there were only a few VWs around, owners used to wave at one another to acknowledge that they were the vanguard of the future. They don't do that anymore. But Austin America owners do, maybe that tells you something. /MT

Austin America

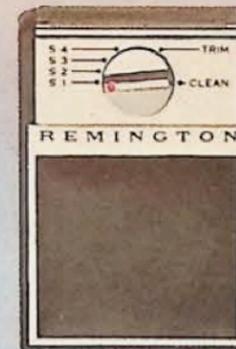
SPECIFICATIONS

Engine: OHV 4-cyl. **Bore & Stroke:** 2.78 x 3.20 ins. **Displacement:** 77.9 cu. in. **Hp:** 58 @ 5200 rpm. **Torque:** 69 lbs.-ft. @ 3000 rpm. **Compression Ratio:** 8.8:1. **Carburetion:** S.U. single. **Transmission:** 4-speed automatic. **Final Drive Ratio:** 3.76. **Steering Type:** rack & pinion. **Turning Diameter:** 35.2 ft. curb-to-curb, 3 1/8 turns, lock-to-lock. **Tires:** 5.95 x 12 Dunlop, 6-ply tubeless. **Brakes:** 8.0 in. disc, front; 8 x 1.25 drum rear. 196.2 sq. in. swept area. **Suspension:** Front: unequal length control arms with Hydro-lastic units interconnected. Rear: Independent trailing arms with Hydrolastic units, aux. springs. **Body/Frame Construction:** Unit body. **Dimensions, Weights, Capacities:** Overall Length: 146.75 ins. Overall Width: 60.38 ins. Overall Height: 53.0 ins. Wheelbase: 93.5 ins. Front Track: 51.5 ins. Rear Track: 50.88 ins. Curb Weight: 1852 lbs. Fuel Capacity: 10 gals. Oil Capacity: 8 qts.

PERFORMANCE

Acceleration: (2 aboard)
 0-30 mph 6.0 secs.
 0-45 mph 10.8 secs.
 0-60 mph 19.0 secs.
Standing Start 1/4-mile
 65.12 mph, 20.66 secs. (1 aboard)
Passing Speeds: (3-4 gear)
 40-60 mph 10.2 secs. 746 ft.
 50-70 mph 21.3 secs. 1874 ft.
MPH per 1000 RPM: 16.5 mph
Stopping Distances:
 from 30 mph 28 ft.
 from 60 mph 114 ft.
Mileage:
 Range: 22-26 mpg
 Average: 24 mpg

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for your car, because

Tiger Paws
it's a rough world out there.

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They have to run barefoot on broken bottles, tin cans, bricks, planks and gaping potholes.

A tire can get killed that way.

As a matter of fact, many more tires are put out of commission on city streets than on the highway. It's a fact.

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Not only is it a Tiger Paw, but it's a Wide Tiger Paw. (31% wider than a conventional tire.)

Not only is it a Wide Tiger Paw,™ but it has an extra protective 2-ply belt of glass fibre between the tread and the regular plies of cord.

Put all that together and you've got yourself an Alley Cat.

Not only is it great for high-speed turnpike driving and for rugged mountain roads, but it's very much at home going through tin can alley.

And not only is it less apt to get disabled, but it wears 55% longer than conventional tires.

If you do part of your driving on city streets or rough roads—and who doesn't?—you'll be glad you put these tough, scrappy paws on your car.



THE ALL PLASTIC CAR: Closer and Closer

by Bob Fendell

No one — not even men like Morgan Martin, Bill Suiter or Pat Amendolia — is saying you are going to drive an all plastic car out of the showroom tomorrow or next year. But some have solid encouragement in that direction from Detroit or overseas. And they are talking about plastic everything, not only the body and interior. The reasons they are optimistic are: (1) a cost squeeze in Detroit with steel costs leading the way up; (2) the new safety and anti-pollution rules which change design thinking radically.

Amendolia, Martin, Suiter and colleagues are not shooting for "making a steel car out of plastics." They want the advantages of the given material to dictate the construction design. The reason Detroit listens is that these people and others already have demonstrated that plastics can save money while giving superior performance.

Morgan Martin is vice president of Molded Fiber Glass Body Co. which makes most of the Corvette body. He says, "The basic reason for using fiber glass reinforced polyester (FRP) is because it has desirable properties and qualities. With growing recognition of these advantages, FRP applications have moved into much higher volume areas."

FRP, or what most laymen call fiber glass is several basic materials — fibrous glass reinforcement, polyester resin and fillers — mixed into what is called a composite. RECO, MFG's

research arm, tests and modifies all the ingredients continually. The object of the game is to improve quality and strength while giving Detroit the benefits of lower cost — until some manufacturer designs an all-FRP station wagon, taxi or — dream of dreams — family sedan. This is a game going on everywhere in the giant plastics and chemical industries.

An interesting plastic, acrylonitrile-butadiene-styrene (ABS) is the basis of a new project at Marbon division of Borg-Warner's Washington, West Virginia, plant and at Centaur Engineering (Detroit). "Phase II" is happening because Bill Suiter, president of Marbon, says his firm has engineered a breakthrough in tailoring ABS for automotive use by adding a "secret something." Incidentally, Uniroyal, which invented ABS and which is a major competitor, just announced what it calls the first flame-resistant ABS which retains its strength.

ABS takes impact well, can be formed almost as quickly as steel can be stamped, is easy to paint or chrome and its tooling is even less than for metal die molded FRP which is, in turn, only a fraction of tooling for steel. But early ABS softened in the sun and exhibited poor resistance to liquids normally found in a car. Of course, steel is not perfect either since it dents, twists and rusts, things ABS doesn't do.

"The reason I can't give details on our breakthrough is that

we are working under contract to someone in Detroit,"

Suiter said. Meanwhile, Citroen and Marbon have announced the first ABS production car, one model of the Ami.

The reason Marbon's project is called Phase II is because Phase I was the CRV car, built by Centaur, made of Cyclocac, Borg-Warner's brand name for ABS. The CRV was "an attempt to prove to ourselves as much as anyone else that an auto body vacuum formed in two or three pieces of this material could last 100,000 miles under the most severe use.

"This we did with the CRV, which we raced," Suiter continued. "We also learned the problems we faced if we were to make a true car of ABS — doors and everything. What the CRV did is generate projects in specific cars. You can lean on these new prototypes and you won't feel the side give even a little. You don't have to worry about spilling a little gasoline or battery acid. Incidentally, none of these have steel frames as such and they are being designed for volume production."

Detroit sources declare Marbon is aiming toward a \$3000 passenger sedan in the compact category, as well as a sports coupe which would be higher priced. Construction technique envisions a setup similar to the final CRVs in which huge pieces would be formed and then stuck together with adhesives far stronger than any riveting technique.

Meanwhile, Uniroyal and others are not sleeping. The big tire company has used the resurrected Cord as its show car, crashing it through brick walls to show the strength of its expanded ABS but it is not forming any new bodies for the Cord and has shipped all tooling to the Cord Co.

Richard C. Bolesky, manager of sales engineering for Royalex, however, feels the material cost factor is going to block production of an ABS car for the near future if more than about 15,000 have to be made. "With the number of car models increasing every year, some specialty cars may eventually be made of ABS," he prophesied. "We did the Bordinat Cobra in Royalex and were told that no other material could have formed that car in one piece. ABS is really a generic term, since it has so many versions. You can expect even greater things from it in the future when we get fiber-reinforced versions.

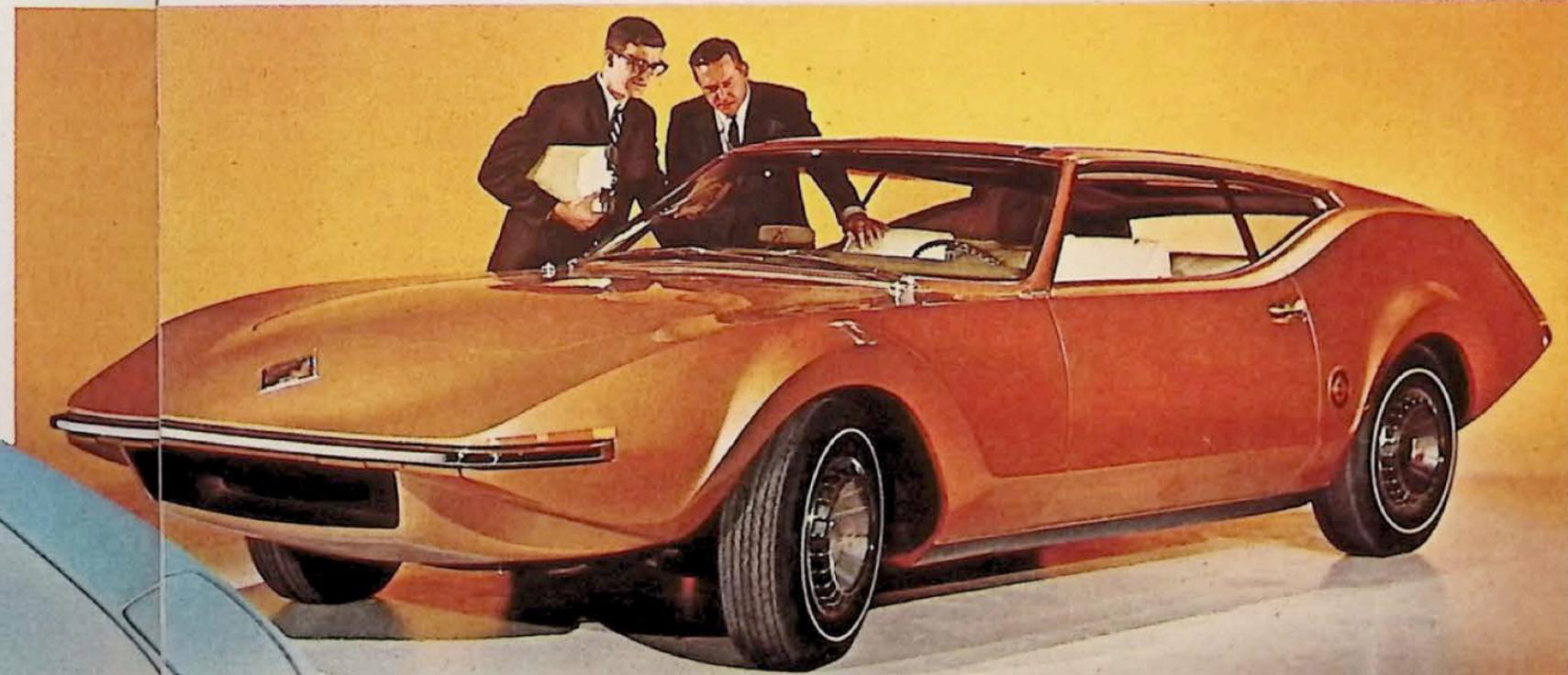
WHAT ABOUT FIBER GLASS?

Fiber glass (FRP) remains the material to beat mainly because it has been the most researched and at the present time has the best overall characteristics for car use. Polyester and epoxy — two of the plastics reinforced with glass — are called thermosets. Unlike thermoplastics like

continued



FRP convertibles, RECO sedans, CRV fastbacks — here you are, America, right on the brink of a brand new polystyrene-acrylonitrile-butadiene-styrene Newspeak — a synthetic vocabulary about synthetic cars for a synthetic world. But the production practicality of a plastic car is difficult to resist, and it has everything but that elegant texture of steel that is the essence of Class. Proper compounds now give plastics nearly all the qualities of steel, but with less cost. The Bordinat Cobra (right), a couple of years old by now, was formed in one piece from Royalex, a revolutionary feat at the time. The Explorer (opposite page), made from Plexiglas by Rohm & Haas, needs no finishing after fabrication. Finishes simulate different metals and wood grains. Leather seats are acrylic-coated for better wear. Plexiglas tail lights rim the rear.



PLASTIC CAR: continued

ABS, they retain shape permanently once they are molded. They will flex up to their maximum elasticity, then break. The breakpoint in automotive grade fiber glass-reinforced polyester has been pushed so high that many mishaps that deform steel sheet will not affect this material.

Two cars of the future utilizing these thermosets represent opposite approaches to the design of a plastic car. One, now called the Mobay car, originated with Mobay's German parent firm, Farbenfabriken Bayer. The other is the brainchild of a plastics consultant, Pat Amendolia, who literally built it up by himself. It, unlike the Uniroyal and Marbon projects, is made up of several different kinds of plastic. And it is not only a showcase for plastics, it is a chance for him to exhibit his auto construction ideas which might work just as well in some other material. For instance, this 2-seater's transmission tunnel serves several purposes. It houses all wires, lines and mechanical components. Part of the driveshaft is to be plastic see-through material (polycarbonate) and the fuel line, also of clear plastic (urethane), loops up so that the driver can actually see the gasoline slithering from the Firestone Safom fuel cell under the rear window toward the Corvette engine.

Underneath the transmission tunnel is a shield and housing for rocket assist brakes. Amendolia notes that firms like Aerojet General have experimented with rocket assist braking for trucks and he has some ideas concerning this application for cars — not for everyday use but for the emergency when conventional brakes either fail or are obviously not going to get the job done.

Built on a 99-inch wheelbase, the 14½-foot long TDX is of monocoque construction, mainly of a sandwich of FRP with a urethane foam filling. The result is a stiff body of fantastic strength considering the weight. TDX, however, could be even lighter than its current weight of 2600 pounds when ready to roll. Pat is also testing fabrication ideas with different thickness of FRP sandwich and figures he could take off 500 pounds, easily.

There are so many ideas in this vehicle that it is difficult to enumerate all of them. For instance, this may be one of

the first uses of a new ballcup safety valve which could make Firestone's foam-filled (Safom) fuel tanks feasible for passenger use. The rear window is an expensive plastic called polycarbonate, used now on space missions and riot shields. It is virtually shatterproof, is clearer than glass and Amendolia has figured out a simple way to form it into the complex rear window shape. It is far more practical, cost aside, than current glass fastback windows, according to Pat.

Pat also doesn't believe the average driver cares to read gauges or will have the time in superhighway traffic of the future. So he's worked out a system of sophisticated idiot lights which flash from green down the spectrum to red. The speedometer will be in feet per second, which Amendolia thinks should be standard because it's more meaningful. The idiot light approach also solves the problem of a gas gauge for the Safom tank which obviously won't work with standard float level or electric gas gauges.

The TDX started in the fall of '65 when Amendolia decided to put all his ideas "in one package as a sort of 3-dimensional résumé." It has been built between making a living, and the delay actually has helped because Pat has been learning new things about plastics and how to work them. "I'd say anyone who wants to build plastic cars should consult auto body men and find out where regular cars sustain damage most often and why," he advised. "Then, when they lay out their designs, they can take this into account."

MOBAY — A DIFFERENT CONCEPT

The Mobay car has an entirely different concept behind it and yet it, too, is virtually all plastic. Powered by a 2-liter BMW engine, the Mobay car is intended only to demonstrate what is feasible with current plastics technology. It is built up on a platform chassis made of a sandwich of glass-reinforced epoxy skins and a rigid urethane foam core. This was done primarily to illustrate Bayer's capability of making large area thin-wall urethane sandwich components.

What Bayer accomplished is to show how each plastic can be tailored to many uses. For instance the urethane is used two ways as part of a sandwich out of which the fenders are made. The front have hard epoxy faces and the rear have an ABS urethane skin which depresses when touched. The



Pat Amendolia, a plastics consultant, made the TDX from several different kinds of plastic. (Clockwise, beginning at left) Front end is striking, but entirely functional. Radiator is slanted for low silhouette. Hood contains scoop and headlight extensions for modern look. Section of Corvette front frame was retained so engine could be mounted firmly. Instead of glueing engine directly to the plastic, frame piece was laminated into channel rail. The coil springs are standard Corvette and attach directly to the monocoque, as do the shocks. Filled sandwich construction helps damp sound and road vibrations. FRP with urethane foam filling gives excellent strength. Gasoline is visible in urethane fuel line from Firestone Safom fuel cell. Uniform fabrication can make passenger area into a safety pod.



So you've got a many-cube mill, and every now and then you've just gotta stick your shoe in it. Flat out from 0 to Gone.

But you worry a little. You've seen what happens when an oil filter folds under pressure. Zap. Six quarts on the ground and some bearings broiled by the time the brakes bite. Scary, isn't it?

Well, not anymore, baby. Because now the Wix Racing Oil

Filter takes the worry out of winding it out. That's it: a Racing oil filter. Tough, reliable —made for competition.

A Wix Racing Oil Filter takes the pressure of redline rpm all day, and still delivers a fantastic 20 gallons per minute of clean oil to your engine's innards.

Man, that's protection. And protection is what a filter's for.

So protect your engine's performance. Spin on a depth-type

Wix Racing Oil Filter, and rip those skinny ET's with confidence.

Only three things to remember:

Drive Safely.
With a Wix Racing Oil Filter.
Like Now, Baby.



Now, Baby.



4.0.0



PLASTIC CAR: continued

hood, roof and trunk are also urethane foam but so dense it feels solid. Most of the interior is padded with the kind of urethane in a polyfoam mattress.

In the Mobay car, plastics have replaced metals completely in functional load bearing areas throughout the chassis. This frees the designer from the stereotype X-frame and allows him to design a total rolling package.

HOW ABOUT COST?

This is great technically but how does it compare costwise: Metzler, another German chemical company which produces a car similar to Bayer's, priced out its Delta L and found that at 1968 figures, the vehicle would have a \$500 cost penalty over a steel car of similar dimensions. However, the Metzler car would be lighter and, therefore, faster and more efficient, and, Metzler claims, much safer. How do you put a price on factors like that?

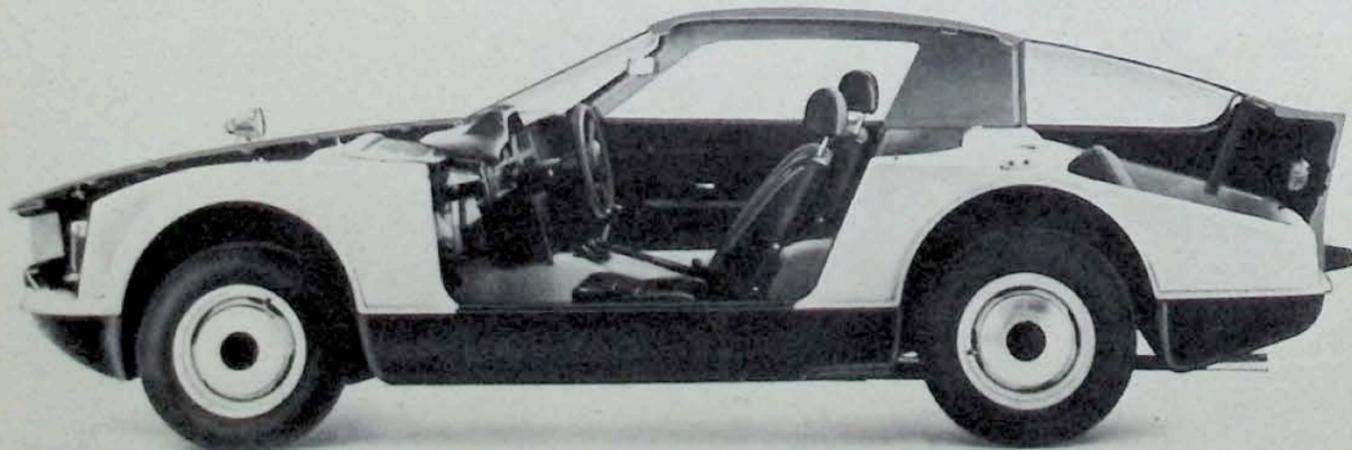
Since safety is a prime ingredient of every car sold in the U.S., Morgan Martin of MFG suggests that maybe the concept has to be rethought. "In a parking lot mishap," he said, "we worry about the car but in a collision at speed, only the safety of the occupants counts. In the minor accident, FRP will sustain 6.6 times as much force or be deflected more than six times as far without damages as comparable to steel parts. In order to have the same resistance to casual damage, the steel parts would have to be made of hardened spring steel.

"The only way an automobile body can offer any protection to its occupants is in absorbing energy as the various parts bend or break," Martin said. "The fiber glass absorbs far more energy in breaking than steel does in bending. We may be startled to see an FRP body shattered in a collision because the result is completely different from the twisted crumpled wreckage to which we are accustomed. This shattering represents a sizable part of the energy that had to be absorbed to bring the occupants of the car to a halt. So, definitely, the occupants of a molded fiber glass bodied vehicle have a better chance of survival," he concluded.

DO PLASTICS HAVE AN ADVANTAGE?

The great advantage of plastics (as opposed to metal) in

Mobay Chemical Co. had their all-plastic car designed by Bayer AG of Germany, to give it both tasteful lines and functionality. A cutaway view shows areas in which various plastics are used: fenders, engine hood, roof, trunk lid, instrument panel padding, cushion mountings for headlights and bumpers, steering wheel cover and horn, carpeting, auxiliary springs, tie-bar bearings, head and arm rests, dust hood and bellows, door closing guides, foot pedal bushings, finish — well, just about everything.



the eyes of a growing number of Detroit engineers is because they are man-made right from the chemicals and plastics can therefore be tailored more exactly for the particular job a part of a car must do.

The horror of every design engineer in Cartown is over-engineering — making a component far stronger than it need be. This usually means extra cost and no private enterprise willingly takes an extra cost.

This also explains why Detroit is continually assessing new ways of manufacturing plastics, metals and even newer composites which actually combine the two. For instance, most of the so-called mature plastic materials can be mechanized or automated, assuming there is a volume production needed.

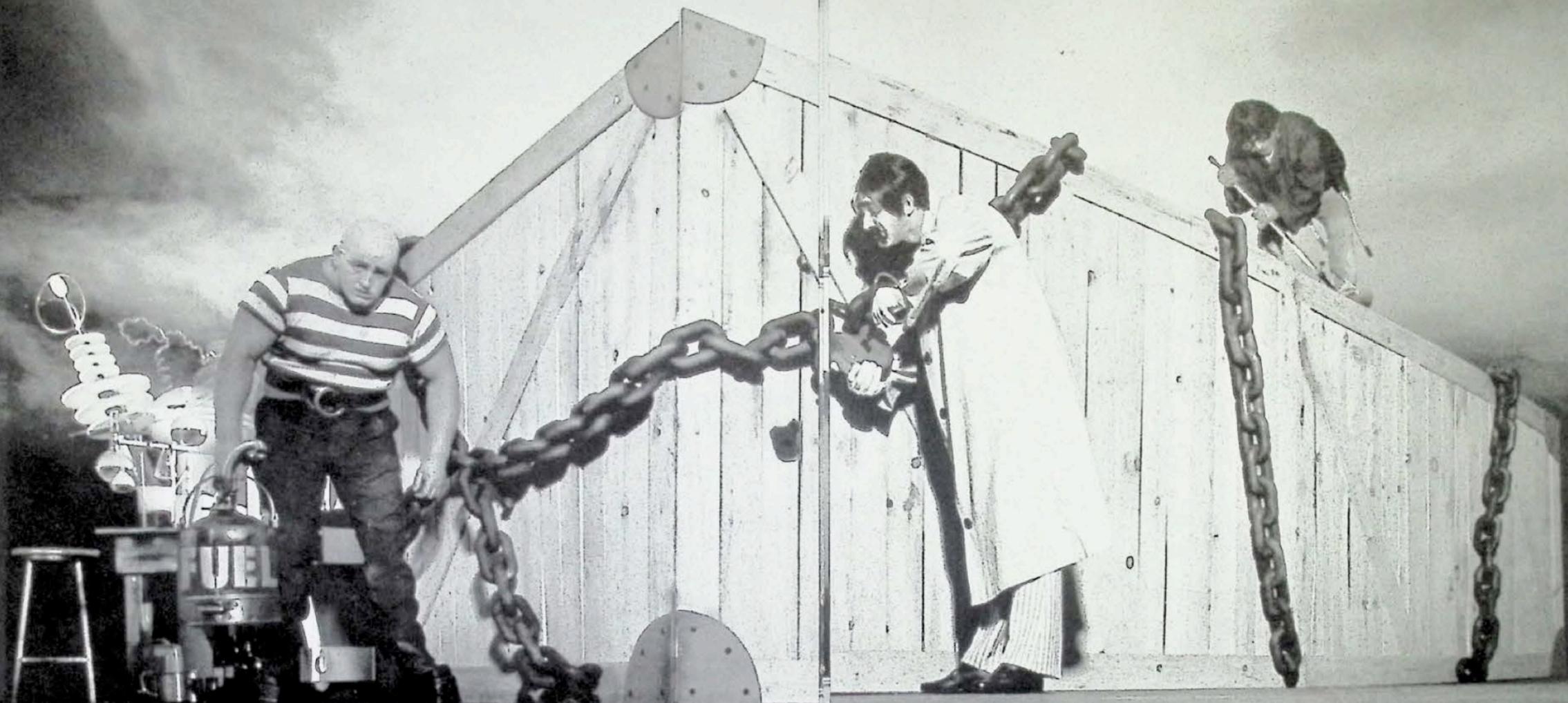
Amendolia figures that his car is only a partial statement of what is possible as more exotic plastics and composites come down in price. If he could make the same car of whisker-reinforced plastics (which use microscopic metal whiskers instead of glass fiber), he figures it would be so strong that literally nothing on the road would phase it, whisker-reinforced plastics are so expensive only the military can consider making large objects of them.

As the price of the new engineering plastics drops, new configurations will become feasible. For instance, polycarbonate has the highest impact strength of any thermoplastic and could be formed as easily as ABS into one-piece shells or sandwich constructions with urethane. But, although the price of this material has dropped 10-20 cents a pound in one year alone, it still costs twice as much as ABS, which in turn costs more than sheet steel.

"The explosion we have seen in the number of models offered to appeal to different groups of people is bound to continue," Martin summed up. "There is no more reason for buyers to accept general-purpose cars than general-purpose shoes. Can you imagine a manufacturer offering only one basic style of shoes with optional soles or laces depending upon whether they are to be used for sports or formal wear? The use of common styling and parts for sedans, station wagons and sporty cars is bound to become nearly as unacceptable. As the economics of new materials and methods are recognized it no longer will be necessary." /MT



**DR. OLDSMOBILE
CREATES A
1969 W-MACHINE.
OR TWO.**

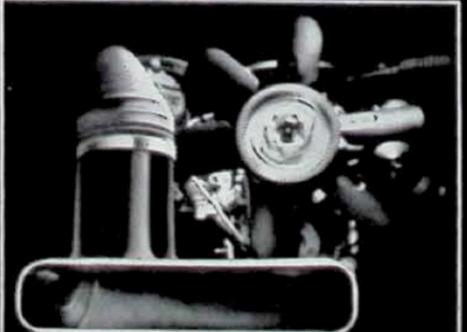


That's who the free-breathing, 1969 W-Machines from Oldsmobile were created for.

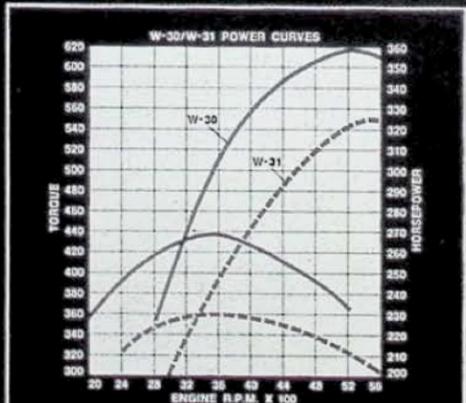
Oh sure, the good doc has whipped off some pretty great coups in the past. Just last year, 4-4-2 was named Performance-Car-Of-The-Year. And that was a standard 4-4-2. At the same time, Cutlass and F-85

...BUT IS THE WORLD READY?

A small, sophisticated part of it is. That small, knowing part that demands a whole lot more out of a set of treads than just transportation. That small, hard-core part of it that thinks perfection in automobiles is worth shooting for. That's who the good doctor (and his fanatical engineering sidekicks) pulled on the coveralls for.



How can you tell a W-Machine when you see one? Simple. Just look for a pair of mammoth functional air scoops—mounted under the front bumper!



New exhaust manifold on W-30 and all 4-4-2 engines has streamlined individual branches. Reduces back-pressure, improves tuning. New W-30 and W-31 engines feature more usable power through entire speed range. W-Machines' power curves shown.

models with newly tooled Rocket 350 V-8s were nailing down honors in the new mini-cube market.

So much for past history. This year, Dr. Oldsmobile has outdone himself—with a pair of 1969 Ws that are really something else. Take the new Olds 4-4-2 W-30. That means with Force-Air Induction. And



Cutaway shot of new floating-caliper-type front power disc brake. Single-piston design. Internal cooling fins rapidly dissipate heat. Availability depending on engine choice.

that means with a pair of mammoth front air-scoopers; wide-throat dual air ducts; dual intake air cleaner; minimum combustion chamber volume; separated center exhaust ports for optimum tuning; big intake and exhaust valves; streamlined and individually branched exhaust manifold; high-overlap cam; low-restriction dual exhausts; and a pair of whopper hood paint patches. Not to mention a multitudinous array of axle ratios. Plus enough standard heavy-duty goodies to make any red-blooded car buff pop a few buttons with honest pride. And what goes for W-30, goes ditto (in most cases) for its mini-cube mate, W-31. Available in Cutlass S and F-85 V-8 models. The W-Machines have got it all—



An inside look at one of eight, beefy, 1969 rear axles. Ratios range all the way to 4.66-to-1. And each and everyone of them is available with limited slip.

looks, swagger, and credentials! But enough of words. Let's get to the goods. Turn the page. And make friends with a 1969 W-Machine. Or two.



**DON'T THROW AWAY
THE LUMBER.
YOU'LL NEED IT
TO CRATE UP
AND CART OFF
THE COMPETITION.
OLDS 4-4-2 W-30**

W-30 is more than just a great machine. It's a labor of love.

Every moving, breathing part in its engine is individually selected. And matched. And fitted. To extremely close tolerances.

If a part isn't exactly right? It gets the thumb!

The good doc is just as vehement about handling. No 4-4-2 (W-30 or otherwise) gets out of the laboratory without heavy-duty underpinnings—and stabilizer bars front and rear.

If you've been looking for the one that's got everything, now you know where to find it.

ENGINE

Type W-30 Rocket V-8 (available)
Displacement, cubic inches 400
Bhp 360 at 5400 rpm
Torque, lb.-ft. 440 at 3600 rpm

Bore x stroke, inches 3.87 x 4.25
Compression ratio 10.5-to-1
Combustion chamber volume, min.
allowable 79.64 cc
Min. deck clearance 0.002
Carburetion Quadrajel 4-bbl.
Throttle dia.
Primary 1.375
Secondary 2.250
Camshaft duration
Intake 328°
Exhaust 328°
Overlap 108°
Total valve lift
Intake 0.475
Exhaust 0.475

Valve diameter
Intake 2.0625
Exhaust 1.625
Tappet type Hydraulic
Max. valve spring pressure
Closed 128 lbs.
Crankshaft journal diameter
Mains 3.00
Connecting rods 2.50
Firing order 1-8-4-3-6-5-7-2
W-30 system includes 26.2-sq.-in. dual front air scoops; wide-throat dual air ducts; dual intake air cleaner; minimum combustion chamber volume; separated center exhaust ports for optimum tuning; streamlined, individually branched exhaust manifold; high-overlap cam; low-friction bearings; dual hood paint patches; and low-restriction dual exhausts.

Standard engines. A 400-cu.-in., 350-hp Rocket V-8 with heavy-duty 3-speed manual. A 400-cu.-in., 325-hp version with Turbo Hydra-matic 400.

DRIVE TRAIN

Transmission Fully synchronized, heavy-duty 3-on-the-floor with Hurst Shifter. Available: 4-on-the-floor with close- or wide-ratio Hurst Shifter, or Turbo Hydra-matic 400. Special W-30 Turbo Hydra-matic 400 (with high-performance converter, high-rpm shift points, and firmed-up shifts) or close-ratio included with W-30.

8 axle ratios 2.56-to-1, 2.78-to-1, 3.08-to-1, 3.23-to-1, 3.42-to-1, 3.91-to-1, 4.33-to-1, 4.66-to-1. Availability depending on engine choice.

CHASSIS

Suspension Heavy-duty. Includes heavy-duty springs and shocks, front and rear stabilizers.
Steering ratio 24-to-1

Available: 17.5-to-1 with power.
Wheels Heavy-duty 14-inch with 6-inch rims.

Tires F70x14", polyester-cord wide-oval red-lines (or whitewalls). Available: F70x14" fiberglass-belted wide-oval red-line or wide-oval black-wall with raised white letters.

GENERAL

Models Holiday Coupe, Sports Coupe, Convertible

Wheelbase 112"
Overall length 201.9"
Curb wt. (lb.) Holiday Coupe 3675
Tread front 59.0", rear 59.0"

SAFETY

New GM safety features are standard, including seat belts for all passenger positions, and new ignition, steering and transmission lock on steering column.

**A MATE FOR W-30.
WE LOOKED HARD.
BUT COULDN'T
FIND ONE.
SO THE GOOD
DOCTOR WENT BACK
TO WORK.
OLDS W-31.**

Now meet the 1969 Mini-W. You'll know it better as W-31—a 350-cuber with Force-Air Induction, increased hp rating, quick handling, great new styling, and an easy-going price that's bound to make it first choice in the mini-cube grab bag.

You can order yours in a gussied-up Cutlass S. Or you can play it straight and get it in a businesslike, minimum-weight F-85.

In any case, you get it with special behemoth hood paint patches.

And if you've a need to be personally involved, you've come to the right place. The good doc's list of available goodies is as long as your arm: 4 speeds with close- or wide-ratio, Anti-Spin Axle, tach, wide-boot blackwalls with raised white letters, Super Stock Wheels, and so on.

This year, have it *your way*.
ENGINE
Type W-31 Rocket V-8 (available)

Displacement, cubic inches 350
Bhp 325 at 5400 rpm
Torque, lb.-ft. 360 at 3600 rpm
Bore x stroke, inches 4.057 x 3.385
Compression ratio 10.5-to-1
Combustion chamber volume, min. allowable 67.92 cc
Min. deck clearance 0.002
Carburetion Quadrajel 4-bbl.
Throttle dia.
Primary 1.375
Secondary 2.250
Camshaft duration
Intake 308°
Exhaust 308°
Overlap 82°

Total valve lift
Intake 0.474
Exhaust 0.474
Valve diameter
Intake 2.000
Exhaust 1.630
Tappet type Hydraulic
Crankshaft journal diameter
Mains 2.50
Connecting rods 2.125
Firing order 1-8-4-3-6-5-7-2
W-31 system includes 26.2-sq.-in. dual front air scoops; wide-throat dual air ducts; dual intake air cleaner; minimum combustion chamber volume; high-overlap cam; low-friction bearings; dual hood paint patches; and low-restriction dual exhausts.
Standard V-8 engine, 350-cu.-in., 250-hp,

2-bbl. carb, Rocket V-8. Available: 350-cu.-in., 310-hp, 4-bbl. carb version.

DRIVE TRAIN

Transmission Fully synchronized, 3-speed manual. Heavy-duty floor-mounted Hurst Shifter version with W-31. Available: 4-on-the-floor with close- or wide-ratio Hurst Shifter.
8 axle ratios 2.56-to-1, 2.78-to-1, 3.08-to-1, 3.23-to-1, 3.42-to-1, 3.91-to-1, 4.33-to-1, 4.66-to-1. Availability depending on engine choice.

CHASSIS

Suspension. Four-coil-spring with front stabilizer bar. Available: Heavy-duty shocks, front and rear.
Steering ratio 24-to-1
Available: 17.5-to-1 with power.
Wheels 14-inch
Available: 14"x6JK wheels.
Tires 7.75x14" blackwall
Available: 7.75x14" whitewalls; also wide-oval red-line or whitewall with

polyester-cord or fiberglass-beltting; plus new F70x14" wide-oval blackwall with raised white letters.

GENERAL

W-31 Models . . . Available in Cutlass S and F-85 V-8 models.
Wheelbase 112"
Overall length 201.9"
Curb wt. (lb.) Holiday Coupe . . . 3465
Tread front 59.0", rear 59.0"

SAFETY

New GM safety features are standard, including seat belts for all passenger positions, and new ignition, steering and transmission lock on steering column.

Oldsmobile reserves the right to make changes at any time, without notice, in prices, colors, materials, equipment, specifications, and models, and also to discontinue models. 9-69 Printed in U.S.A.

WHEN HEADS TURN
AND HEARTS
THUMP,
YOU'LL KNOW.
THE WS ARE

NEARBY.
MAKE FRIENDS
WITH THEM.
THEY'RE YOUR WAY
TO ESCAPE FROM
THE ORDINARY.



DR. OLDSMOBILE'S
1969 W-MACHINES:
W-30/W-31.



my dad can beat your dad

Mark Donohue wins USRRC and Trans-Am
with Sunoco 260 super premium gasoline

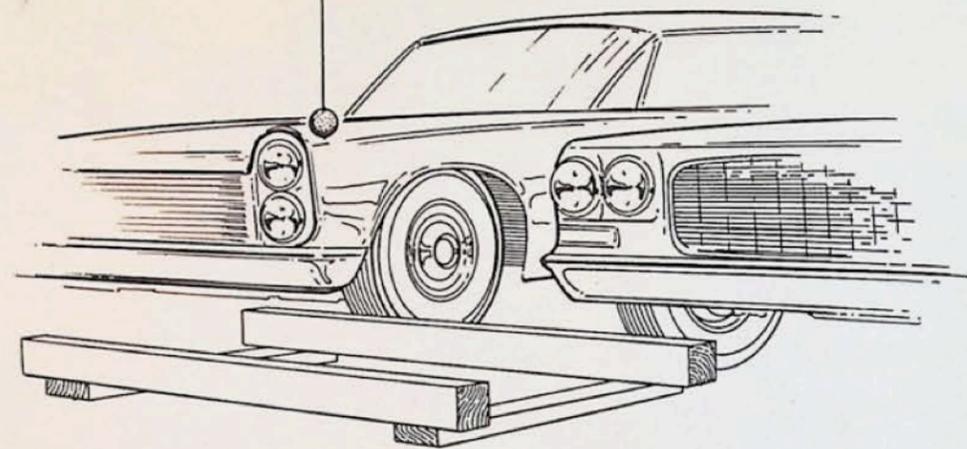
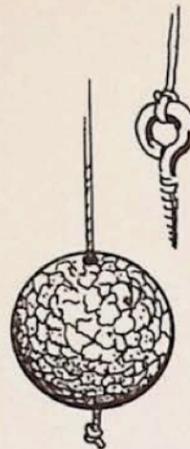
Young Mike Donohue has a lot to brag about. His dad swamped the competition in a Roger Penske "Sunoco Camaro" to win the 13-race Trans-American sedan series. Then dad encored with his second straight U.S. Road Racing Championship, driving Penske's McLaren-Chevy "Sunoco Special." ■ In both victories, Donohue's fuel was straight Sunoco 260—the world's highest octane pump-grade gasoline. The very same 260 you can buy at any Sunoco station. ■ Try some in the family Ferrari. After all, look what it did for the Donohues.



Get the world's
highest octane at
any Sunoco station

IN SEARCH OF A BETTER GARAGE

by Michael Lamm



Aligning the Car

If you have troubles pulling in straight — or if it's hard to judge distances on either side of the car, buy yourself four cork fishing floats at a sporting-goods store. These should be roughly 2-2½ inches in diameter. Now pull both cars into your garage properly, leaving comfortable room between them and next to the walls so people can get in and out easily.

Then take some string, tie each fishing float to one of approximately 8-foot lengths, and climb up to the rafters with the other ends. Hold the free end to the rafters, at the same time letting the floats drop so they just touch the front edge of the left front fender of

each car. Tie the top ends firmly to the rafters in this position — so the cork floats stand just at the height of the left front fenders and gently touch them.

After you've done this, climb down again and back both cars about three-quarters of the way out of the garage. Now repeat the operation so you have two more floats for each car — one near the front end and one toward the back of the garage. Voila! When you drive in, just sight along the cork floats and be sure they gently brush the edge of the left front fender. If possible, the float farthest in should also tell you where the edge of the tire stop is.

Make A Tire Stop

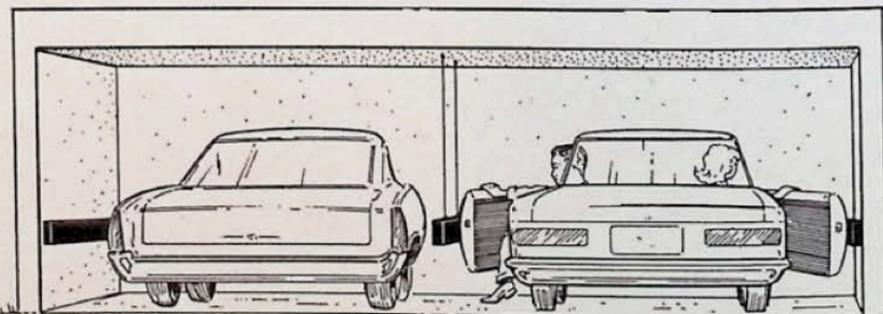
To keep dear old Mom from clobbering the front wall of the garage, all you have to do is build her a tire stop. You need some wood — in this case two 2 x 4s three feet long and two 6 x 6s 4½ feet long (see illustration). Nail these together with an ample number of heavy nails, position the whole thing against the front wall of the garage and in the middle of it (so both cars in a 2-car garage can make use of it), and you've got it made. If you want to do a fancy job, you can in-cut the 6 x 6s where they join the 2x4s, but this isn't really necessary. The inside front tires of your cars will bump up against the leading 6 x 6 and keep you from driving too far into the garage.

To Guard Against Knicks

Now chances are you still don't have enough room in a normal 2-car garage to open your door wide and yet keep from banging into the garage wall with it. So here's what you do.

Go to an upholstery shop that sells foam rubber. Buy two strips about 3-feet by 2 x 5 inches. You can often find two scraps that are near enough the right size to do the job.

With your car in the garage in its normal position, open the car door and see where it touches the garage wall. At this height, place the foam rubber up against the wall and nail it in place. You'll probably need to make washers out of cardboard to keep the nail heads



from pulling through the rubber.

For the car on the right, use the other piece of foam rubber as a suspended bolster. Take a piece of stiff wire or a coat hanger and unbend it so it's straight. Now push the wire lengthwise through the rubber. Suspend the rubber by two strings (one at each end) from the ceiling or the

rafters. It should be the proper height off the floor to stand between the edge of the driver's door when it's open (on the right-hand car) and the closed passenger door of the left-hand car. That trick alone should earn you several hundred dollars at trade-in time — a perfect paint job means an awful lot to a car dealer. /MT



When Ford spent \$150,000 creating this experimental car, you can be sure they didn't scrimp on the oil filter.

They used an Autolite filter. Like you buy. About \$4.

This is the experimental Ford Mach II. It is a one-of-a-kind two-passenger sports car for possible street and competition use.

The hand-built Fiberglas body stands only 47 inches high. Its aerodynamic lines predict the look of tomorrow.

The unusual midship-mounted engine gives the car near-perfect balance. Performance and handling are like a foreign racing machine's.

And the oil filter? A standard Autolite filter. Just like you buy.

Why a standard \$4 Autolite oil filter in a \$150,000 experimental car? Because there is no better oil filter. Not at any price.

The Autolite filter is a two-stage depth filter that can actually *double the life* of your oil. It removes up to ten times more dirt and sludge than ordinary filters. And it has an up-front bypass valve that prevents trapped dirt from washing back into your engine.

Put this kind of filter in your car. Whatever kind you drive.

Autolite . . . filters, spark plugs, batteries, shock absorbers, and complete ignition systems.

Autolite 



Poor Pontiac, here they are only No. 3 in sales and their best image car — the GTO — had suffered the unique distinction of being eclipsed in the supercar firmament it created. But they're not so dumb, these people with silver 3s on their lapels. By carefully exploiting the wallop of the Ram-Air engine option and their superior supercar definition, the flowing lines, scoops, hood tachs and greatest American instrument panel, they kept the kiddies coming. But word got out about the garden variety GTO and how it wasn't the quickest anymore and such news is telegraphed up and down the avenues and boulevards by the drums of the youth underground. This would never do; clearly, the proud men from Indianland were in a bind.

New heads (9794040), that's what was needed. And a cam (9794041) totally designed by computer; the first one ever done this way, they tell us. The combustion chambers were opened up on the spark plug side of the valve and the valves were tuliped for lightness. Exhaust ports suddenly became round where they had been almost rectangular before more direct and the "siamesed" center pair were moved apart after 13 years on the trail together. To prevent any possibility of abnormal oil consumption problems, the new 1/32-inch larger push rod (9794325) has been introduced with internal restrictors to keep large quantities of lubricant from collecting in the valve covers. The whole works was supposed to be worth 20 hp. Whether this was sufficient to bridge the performance gap Pontiac

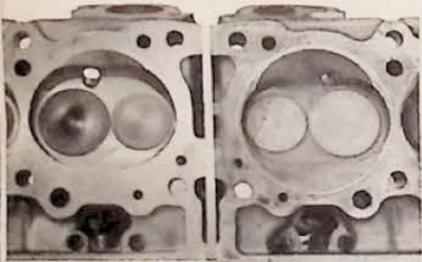
found themselves on the other side of, remained to be seen.

Since the '69 GTO style was thankfully just a whit changed from a good '68, we thought it might be keen to those new power pieces, install them on a '68 and create what for all intents and purposes was the '69 hot item before anyone else. To make things more interesting, Jim Wangers, whose name is as synonymous with Pontiac as Division General Manager John DeLorean, but who actually works for McManus-John-Adams, Pontiac's ad agency, and has become a legend in his own time, suggested that we might spruce the

performance GTO

A little of this and a little of that and Pontiac is still calling the tune.

Text and photography by Eric Dahlquist



The GTO is a slick car, right? Paint and parts made it slicker. New head (left) has tuliped valves, better flow.



project with a Royal Bobcat paint job by George Barris. Since our car had the most luxurious coat of red lacquer ever to dance in the eye, covering it with black, non-reflective textured paint was about as appealing as cutting down a thousand year old redwood. But the kids loved it, recognizing the car immediately as a '69 prototype — the superest looking supercar ever built.

The .480-inch lift camshaft was the same deal as the paint, the original flat nosed version looked more formidable but its replacement buzzed 300 more rpms. Putting it in was no great trick, lining up the timing marks properly is not hard. It is important, however, to use liberal amounts of GM Oil Supplement No. 1050004 to eliminate any chance of galling on the new parts during break in. The rest is a matter of reassembly except that the new heads are thicker on the exhaust side due to the new ports so the bottom row of bolts on both sides are longer by about six threads.

The effort of the new parts was immediate, a stab of the accelerator away. Below is a comparison of how the car ran before and after:

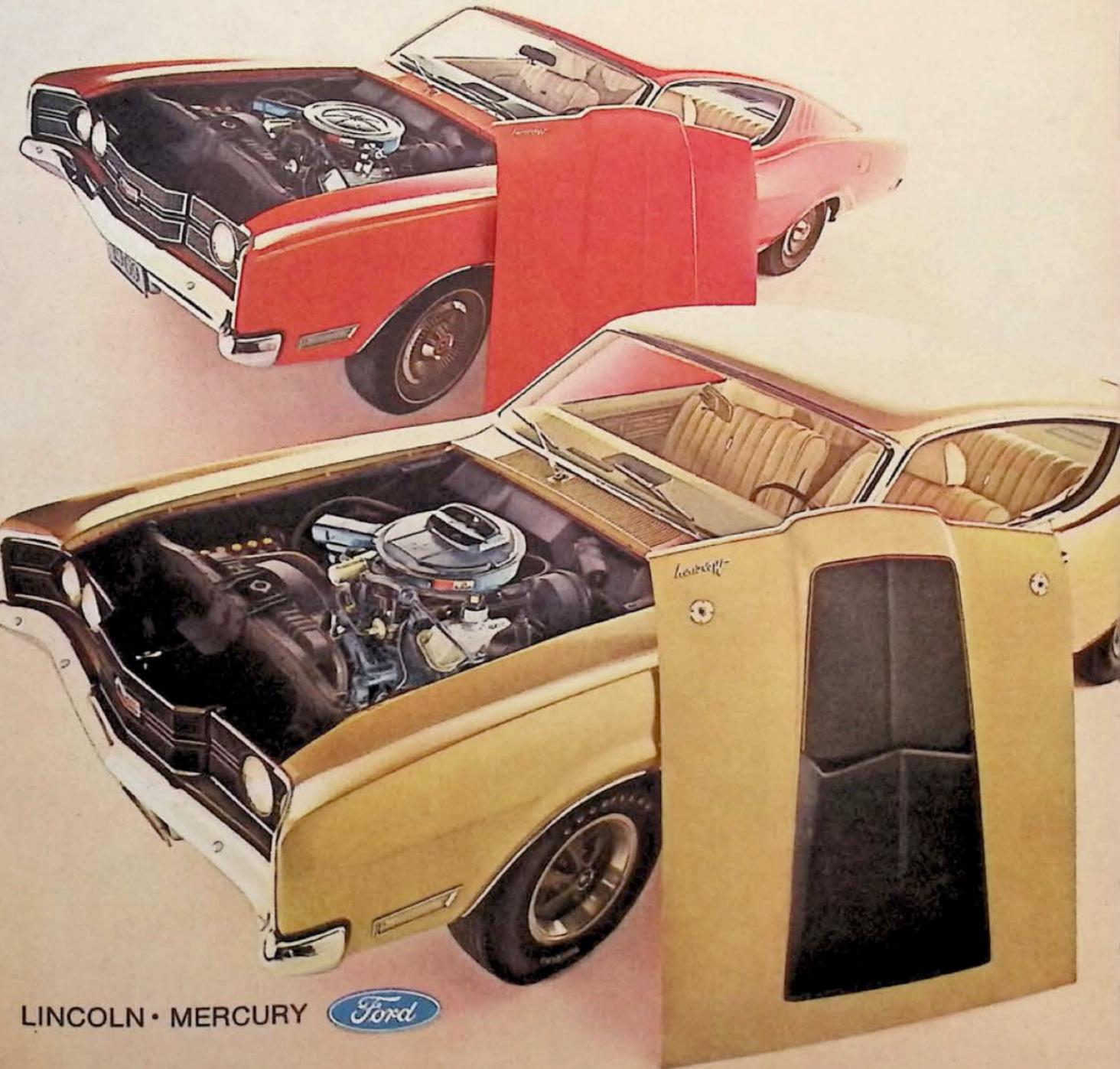
1968 Ram Air GTO, curb weight 3800 pounds.

	BEFORE	AFTER
0-30	2.9	2.6
0-45	4.7	4.0
0-60	7.1	6.1
Standing quarter	99 mph in 14.40	102 mph in 13.95
What more can we say?		/MT

Cyclone CJ is the new name to reckon with in the performance world. Supermuscle in a Mercury fast-back. 428 cubic inches of bold. And you can have 428 straight (CJ 428), or with optional deep-breathing Ram air induction (CJ 428 Ram) which includes functional hood scoop. Also optional: hood locking pins. Either way, your bonnet shades a complete performance package. Standard Cyclone CJ equipment gives you CJ 428

engine with 335 hp and 440 lb.-ft. of torque. 4-speed manual, 3.50:1 rear axle. Low-restriction dual exhausts. Fiberglass-belted tires. Competition handling package, and more. Options, too! Tach. Traction-Lok differential. Optional axle ratios. Select-Shift. Styled steel wheels. Anything you want. And available now at your Lincoln-Mercury dealer, who reminds you that in performance Lincoln-Mercury leads the way.

Cyclone CJ wears two bonnets... one with Ram air induction.



LINCOLN • MERCURY



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Alcoa bet on the
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We're about ready
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Around Alcoa, the aluminum radiator is one of our favorite almost-success stories. We've racked up over 100,000 research man-hours building and testing radiators that weigh half as much as the copper-brass units they will inevitably replace. Alcoa has helped Detroit build better cars for a long time. Aluminum wheels, brakes and drums help stop you safely. Aluminum air conditioners make driving a pleasure. Aluminum

trim stays showroom new. Aluminum radiators provide for higher operating temperatures and pressures, increasing engine efficiency. Over 200,000 vehicles equipped with aluminum radiators have proven their mettle under every conceivable driving condition. Competition cars depend on aluminum radiators. Ask about them when you buy a new car. Be the most sophisticated car buyer in your crowd.



Change for the better with
Alcoa® Aluminum

 **ALCOA**



Maybe your second car should be more than just another first car

These better-idea Fords can do things your first car can't



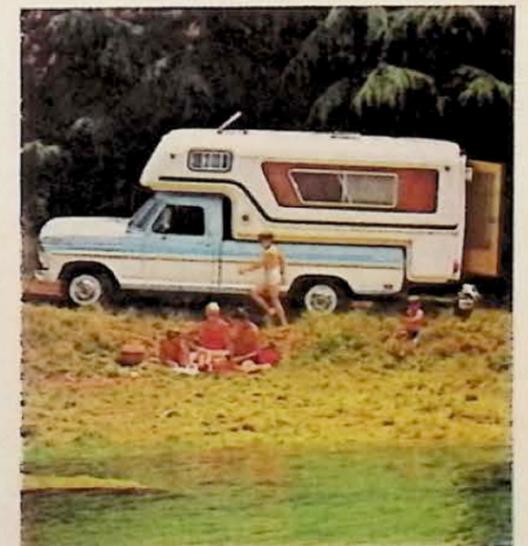
Go anywhere with a 4-wheel drive Ford Bronco. A round-the-town second car, or a spirited hunting and fishing companion. 4-wheel-drive traction sails you through mud, snow, sand. Smooth riding Mono-Beam front suspension; nimble 33 ft. turning diameter; powerful Six or V-8 engine up to 205 hp. Accessories include snowplow.

Carry 12 people comfortably in Ford's new Club Wagon. Wagons always make great second cars, but here's the "greatest"—the roomiest wagon ever built! Room for as many as 12 adults, or room for over twice the cargo ordinary wagons hold, plus five people. Wide choice of interiors. Smooth-riding Twin-I-Beam front suspension.

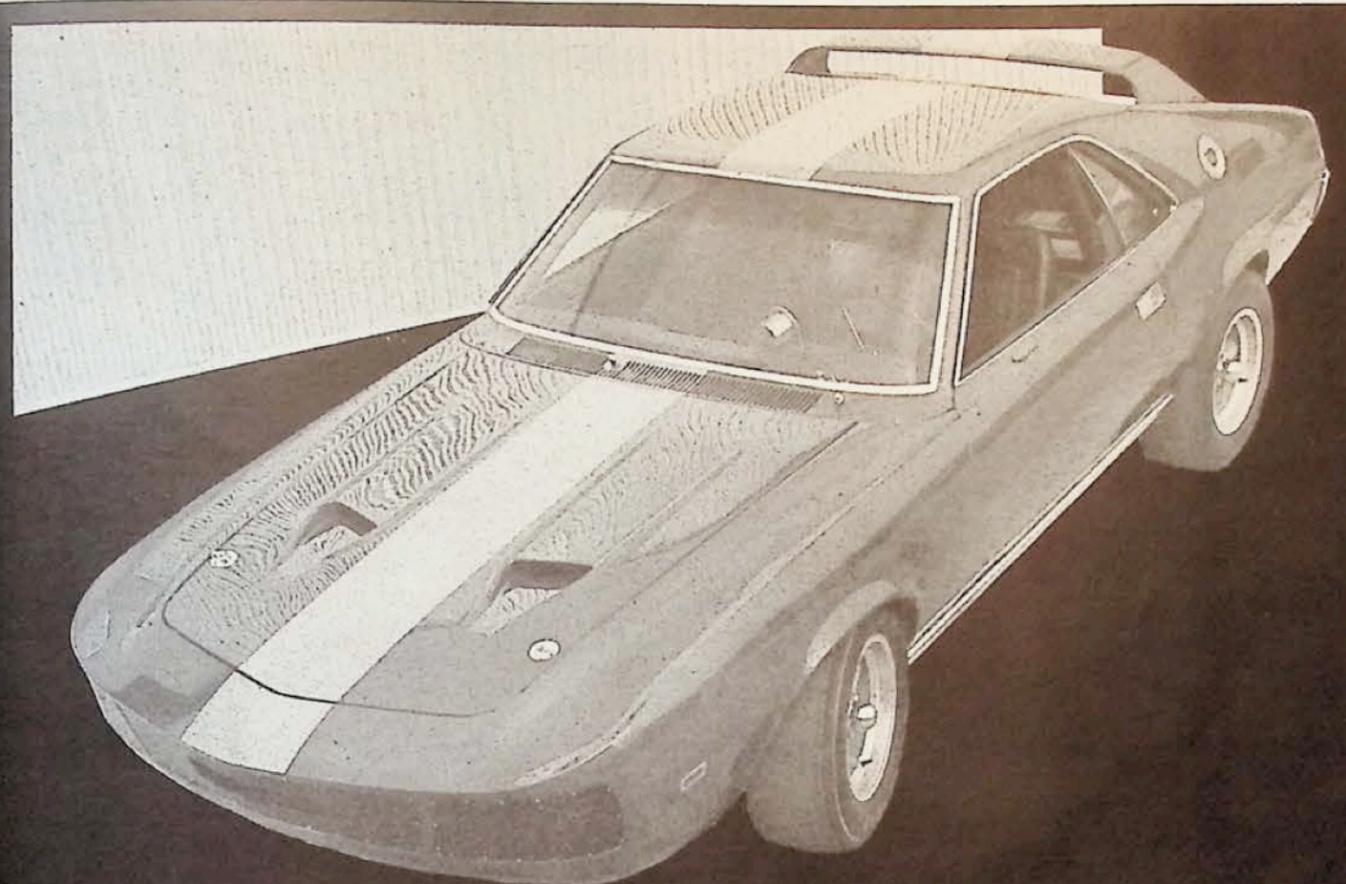


Get fine-car luxury in a hard-working pickup: Ford Ranchero. It looks, rides and handles like a fine car. But in the rear is a 6½-foot pickup box to carry loads no car can. Choice of bucket seats, AM/FM Stereo Radio, Select-Aire conditioner, power steering and power front disc brakes. Seven engines including two 428-cu. in. V-8's.

Enjoy motel facilities wherever you are with a Ford Camper Special. Ford, the pickup that works like a truck and rides like a car, is already a popular second car, and the Camper Special model has all the heavy-duty components you need. Twin-I-Beam front suspension smooths your way. Options include air conditioning.

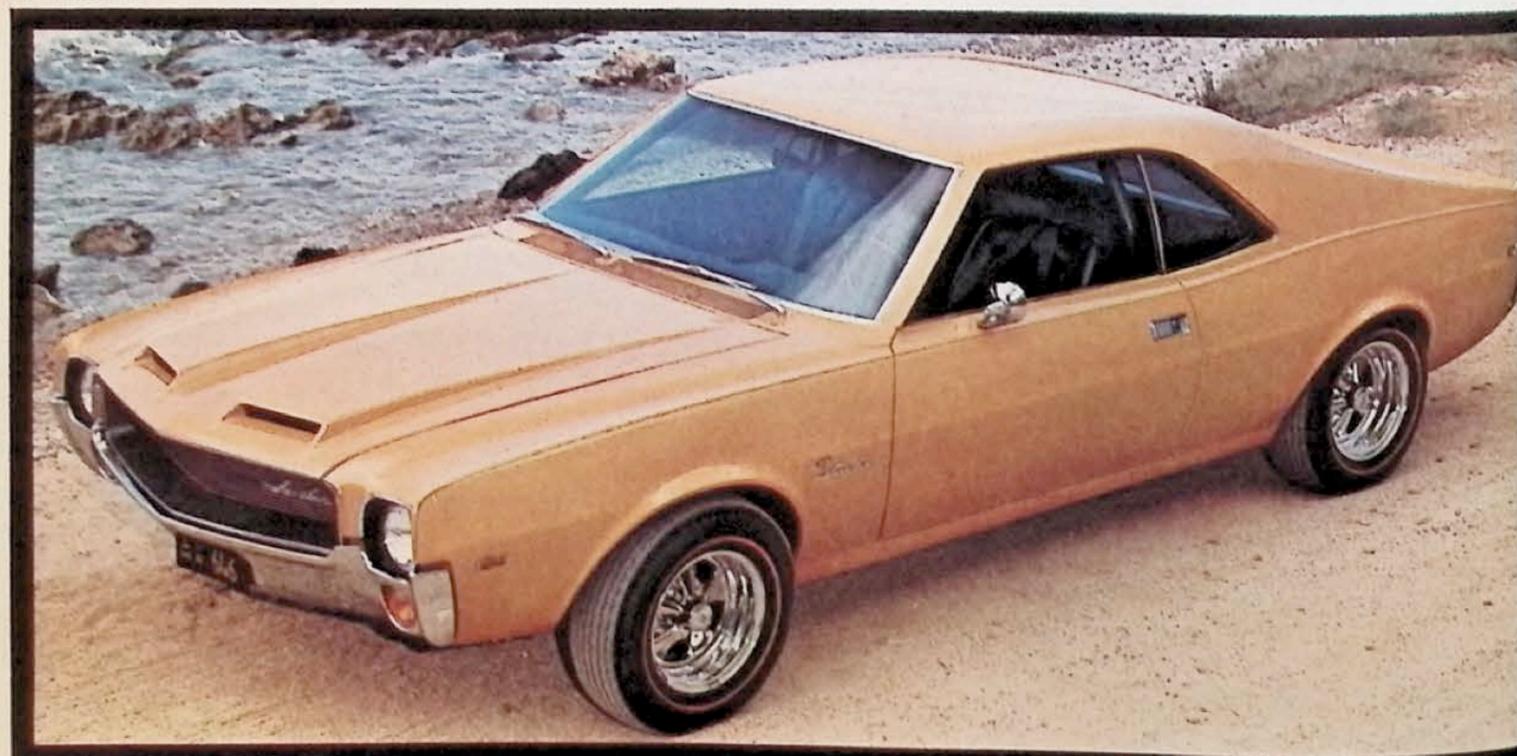


FORD 



The world is a put on — that is, the custom world is. Which is pretty funny because only yesterday it was "in" to pull off all the doodads. Better yet, how about American Motors putting their blessing on modded Javelins and AMXes.

XP Javelin.



THE RIGHT WHEELS

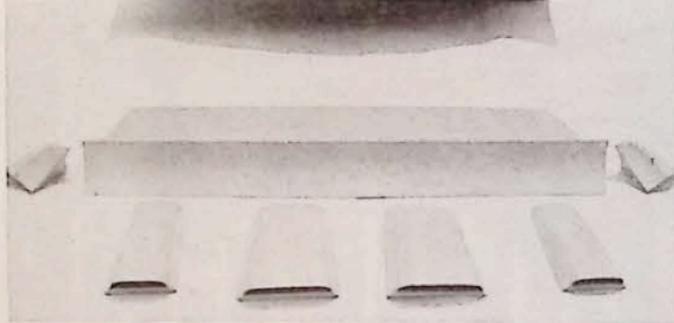
by Eric Dahlquist

BREEDLOVE

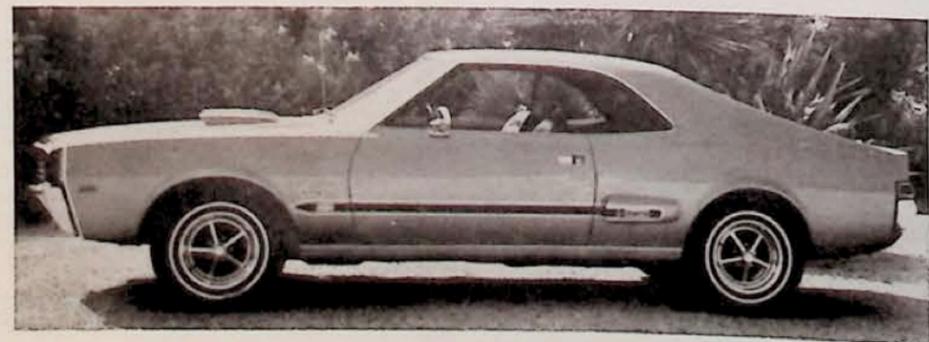


When you first see the Breedlove AMX 600 it looks like a one-off product of some Italian coachbuilder who was singlehandedly stopping the lire drain. 'Taint so, McGee. Craig has a fair knowledge of aerodynamic considerations so he and automotive stylist Bill Moore collaborated on a bolt-on kit for the new AMX that will make it even look newer. It borders on the incredible but the stock front fenders are retained and integrated with a fiber glass grille that is also a partial belly pan. The hood is glass also with NASA-type ducts that pipe air to the carburetors. Just when we had about given up on unique spoiler placement, here comes Moore with one on the top no less. Production versions of the Aerodynamx Kit, as it is called, will have abbreviated aluminum bumpers. Target price is just \$700.

continued



The distinctions between the Bonanza and El Toro (top of page) are of degree rather than type. Rear treatment for Javelin (left) and AMX is very close. Bonanza grille (above, middle) is multiple bar type that's been around since late '50s. 'Toro hood is bedecked with what Barris calls "injector clusters" (above right). Bonanza setup (above left) includes hood/side scoops, spoilered trunk lid. Wheels for El Toro are novel mag-type by Cragar (left). (Below) Bonanza side shot.



BARRIS

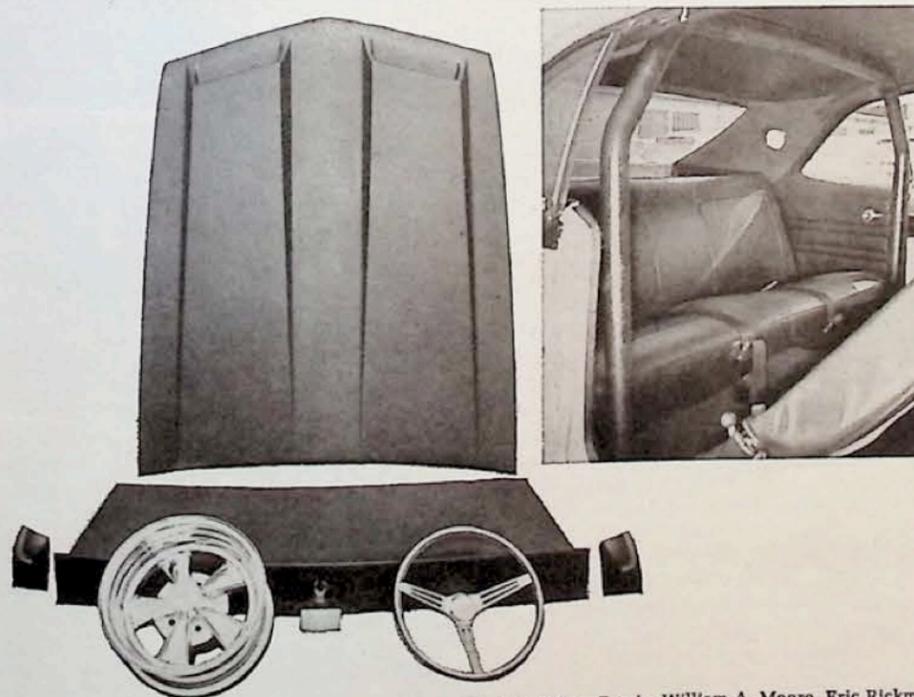
George Barris has been around for a long time — Kustomizing — almost from the beginning. A series of thrown together TV and movie show cars have cast a dark image on his house, but the Barris of old shines though on "straight" jobs. His latest fling is "Instant Kustomizing" for American Motors' Javelin and AMX and marketed directly by AMC dealerships on a nationwide basis. The normal franchised automobile man has never been overly enamoured with customizing in the past because it took too much shop time to turn a profit. Realizing their dilemma, Barris worked up a pair of packages that could be more quickly put on or altered to suit individual tastes. The two themes, Bonanza for the Javelin and El Toro for AMX, feature scoops, deck lids, paint treatments and sporty wheels, things that will change appearance without extensive modifications. Best of all, you can finance it for a few bucks extra a month when you buy the car. Boy, what next?

DROKE BROTHERS

The third prong on American Motors trident of deep sales penetration of the fat youth market is the XP Javelin — conceived by the Droke Brothers, Darel and Larry. Here is the racer's personal machine. No frills or fancy stuff, just clean style and function — the Droke name has been in racing a long time. The hood is worked up from fiber glass and sports a pair of air scoops immediately above the leading edge where a slight but beneficial ram effect is achieved simultaneously with cool air to the carburetor. As with the Barris approach, an integrated trunk lid spoiler is fitted. In a stroke of luck the Javelin and AMX rear fender sections unbolt, so small butting pieces have been designed to finish off spoiler into fender line. Dr. Haddon ought to love this car because it has an optional padded roll bar that anchors to the floor via large flat plates. Still another unique touch is a genuine wood rim steering wheel. Cragar mag-type wheels finish off the model. One of the best things about the XP items, which are available from dealers or DLR Engineering in Downey, Calif., is that the brothers Droke stand behind every piece of the kit. Can't beat that.



Front aspect (left, top of page) gives you the dope on why the scoops provide ram as well as cool air. Placement is a big part of efficiency. Plenum in front of windshield is another ideal high-pressure point but this involves tapping open firewall and no one would know you had it. Most dramatic change is to hind side (above, left) adding popular spoiler with end sections flaring it smoothly into fender line. Pieces (left) are priced at \$136 for the hood; \$150, trunk; \$150 for the roll bar. XP kit with wheels, decal and steering wheel goes for \$550.



Photos: George Barris, William A. Moore, Eric Rickman

The Race for Second

With the points Championship already in the Chevrolet bag, you would have thought the rest of the cast had given up until next year. You would have been wrong.

By Eric Dahlquist

When you are an American, you play to win. No other finish counts. Curious, then, that on Sept. 8, 1968, on the parched range of Riverside International Raceway, Ford Motor Company and American Motors Company were locked in a struggle to gain the coveted, for this season only, second place in the Trans-American Championship for over 2-liter cars. Chevrolet had already won it. Two races before at the tip of Lake Seneca in Watkins Glen, New York, Mark Donohue, Media, Pennsylvania issue of the all-American boy put the series away. Strapped into Roger Penske's blue Sunoco sizzler, the Penske-Hilton-Donohue Camaro droned on to eight back-to-back victories with the cool efficiency of a crew of IBM data processors. A clear margin of 20-50 horsepower on the field most of the season had something to do with it, too. So, as of Riverside, Chevy was safe at goal with 63 points, Ford had 50, AMC 45 and, either Dearborn or Kenosha could axe the other here or at Kent, Washington, the last meeting.

Eight months before, as Jerry Titus savored his Mustang victory in the 24 Hours of Daytona, the specter of Ford getting put down by anybody, much less American Motors who had no cars even in the field yet, seemed a remote prospect indeed. The Javelins, prepared by Ronnie Kaplan, engined by Traco and driven by George Follmer and Peter Revson, appeared on the Sebring scene six weeks later with a single 4-barrel carburetor and a lot of confidence in potentially competitive but untested cars. Seven races later, they were living out the "impossible dream," leading Ford 34 to 33 points and plastering over the horsepower gap so that where Chevy once had had 60 over Ford and Ford 50 over AMC, Ford and AMC were nearing parity.

Ford partisans were in a state bordering delirium. How could this be? How could the smallest automotive manufacturer beat the second largest when the second had dominated the Trans-Am series since the beginning, won last year convincingly, had cubic money to burn and were the Total Performance, Better Idea boys to boot. The signs had been there early for those who cared to look. Standing just outside the friendly territory of victory circle at Daytona, Titus had realistically seen his victory more luck than mechanical advantage. Ford had recently transferred Trans-Am engine assembly responsibility from Carroll Shelby to their own Engine & Foundry Division at Dearborn. Purists shuddered at the thought of non-racers — UAW workers — fitting together powerplants they had only passing interest in. Beyond that, parallel escalations of horsepower and traction had created serious oil starvation on continuous hard acceleration when lubricant tended to slosh away from the front sump. The simplest expedient would be to switch the sump to the rear but good luck would have it, that's precisely where the steering link is. Then they tried oil-pan trap doors — all kinds of trap doors — enough for Count Dracula's castle and when some, but the problem had not been solved claimed representatives of the mighty Ford Motor Company after eight full months.

All of these things and others, less apparent, made the Mission Bell 250 significant for Ford, AMC, Chevy and even Pontiac. How could Ford have even explained it? Being beaten out by Camaros is quite different from being beaten by Javelins.

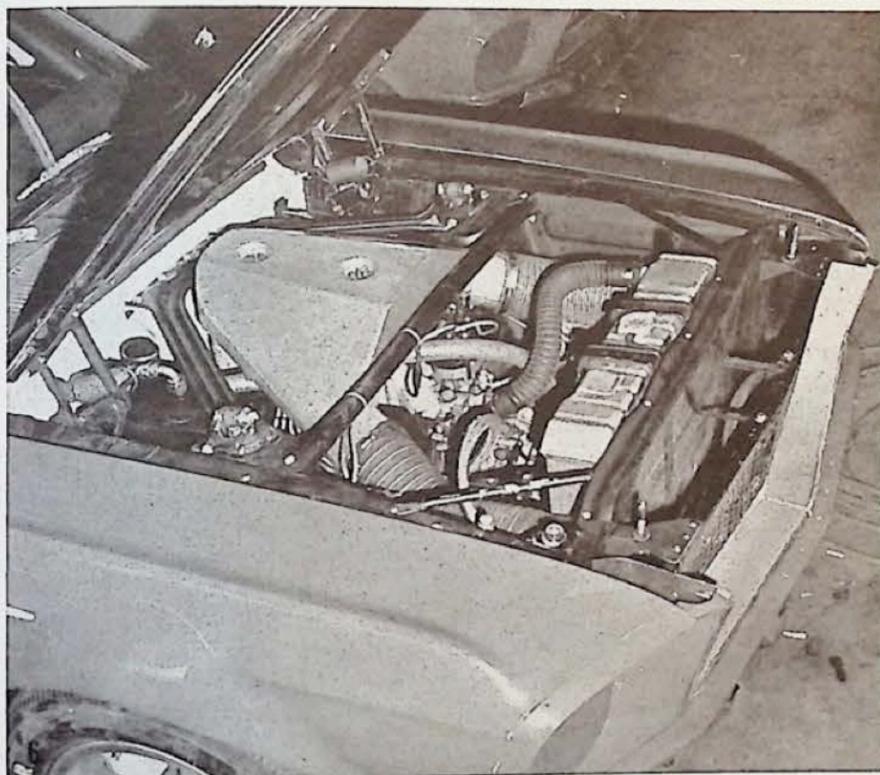
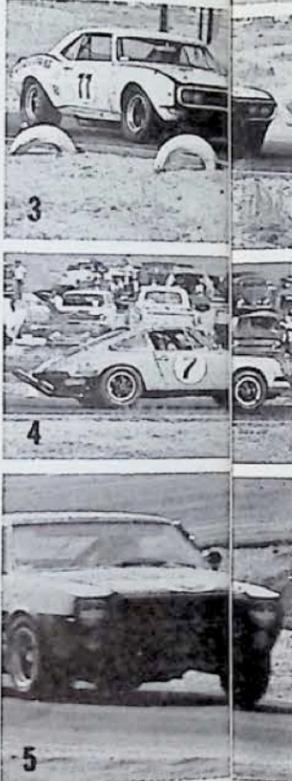
All Donohue-Penske had to do was run out the clock to collect the manufacturers' prize and some wondered if the team would take the event seriously or even come at all. Donohue, of course, sat on the pole. But it wasn't just any old pole shot, he eclipsed Jerry Titus' record of a year ago by 2.4 seconds and at 1.33:6, became the first sedan driver to average 100 mph at Riverside. Titus himself was only an eyelash away at 1.34:3, filling out the front row. Both had '69 pieces in their cars. Donohue was trying out a new cam, slightly redesigned combustion chamber but not the tunnel port, porcupine aluminum small block heads to be ready as a surprise for Daytona. According to FIA homologation rules, 1000-unit quantities of any piece is supposed to be available but SCCA has said nothing about Chevy's trick, very limited edition cross-ram dual 4-barrel manifold that looks like a junior edition of a Chrysler NASCAR hemi manifold, so there's no reason to see difficulties with alloy heads as long as the proper papers are filed.

Ford's tunnel-port configuration, too, is not in what one could call universal supply, but why quibble — the hotter the competition, the hotter the interest generated in the series. Like Chevy, Ford had elected to preview a little of next year's bag with their two team cars, the one piloted by Titus and the other by Horst Kwech, sported subtle changes in cam and cylinder chamber to be used, presumably, with their own version of the porcupine. And the Javelins, poor chaps, finally got the rest of what the others had had all along, a cold-air package for their cross-ram manifold which comes right off Vic Edelbrock's shelf. On the grid, the power rating game looked like this: Donohue, 455-60 @ 7000 rpm; Ford, 440 @ 8000 rpm and Javelin, 435 @ 7000 rpm.

And then there was the strange case of the Canadian Pontiac. Because of the funny manufacturing setup GM has between Canada and the U.S., Canadian Pontiacs are sold with Chevy engines in some models. Nobody thought much about this until Trans-Am racing began and this

1. "Horstpower." Ex-Alfa driver, Kwech, saved Ford from fate worse than death: defeat by Javelins. 2. Titus interior was stark, had fresh air vented to vital spots. 3. Craig Fisher drove Bartz-engined Firebird from 32nd to 3rd. 4. Tony Adamowicz had hot setup for Porsches, angled exhausts into slip-stream for siphon effect. 5. Javelin of Pete Revson nabbed 2nd. 6. Cold air pack for tunnel-port Ford used collection box, ducts from grille. 7. Nose-to-nose confrontation with Camaro (8), leaves Mustang short about 50 hp worth in air-drag. 8. Superstar Donohue is not above driving team truck. 9. Super-cool fuel comes from here, dry-iced 55-gallon drum. 10. Sunoco Camaro are the Wood Bros. north. 22-gallon tank is topped with 23 gallons of condensed fuel in 10 seconds.

Photos: Eric Dahlquist and Joe Rusz



The Race for Second

year someone from Pontiac filed papers with FIA to get the Canadian Firebird homologated for competition. As we all know, Pontiac does not have an engine, except their OHC 6, that falls into the 305-inch displacement limit. But since Canadian Firebirds come with Chevy engines, Chevy's nifty Z-28 is eligible. Sure, Pontiac did not cherish the notion of racing with Chevy power but it made the car competitive right off the bat for anyone who wanted to run it. Toronto, Ontarian Terry Godsall wanted to race. He hired driver Craig Fisher and imported an Al Bartz 304 Chevy that put out nearly the same power as Donohue's. By this time Chevy had become incensed to the point of issuing a bulletin to dealers not to sell their hot cross-ram manifold to Firebird owners but Godsall managed to bluff his way through.

At the beginning of July the car was ready. It finished fourth the first time out at Meadowdale, Illinois. Four races later, Fisher came in second behind the Sunoco Camaro and a week later Jerry Titus announced he was leaving Ford to become President of T/G Racing (Titus/Godsall), a Pontiac team effort similar in concept to the Penske operation but far more ambitious. T/G's scheme is to build 14 Firebirds for next season, three for the T/G Team and the rest for sale at under \$15,000 ready-to-go, cheaper than you can build one yourself. The engine will not be a Chevrolet but some type of existing Pontiac powerplant, scaled down in displacement but hotted up in performance by Al Bartz who will implement the test program. So the Trans-Am goes on to '69 with more new blood marching to the beat that competition sells cars.

Gatorade is what everybody needed at race time. That's the stuff some doctors dreamed up for the University of Florida football team to permit prolonged strenuous exercise in high temperatures without danger of heat prostration. The lemonade looking liquid replaces perspiration and body salts and is absorbed by the system 12 times faster than water. George Follmer estimated that you could put about 10 degrees on whatever the track temperature was to get the cockpit reading. It was 104 in the shade. Follmer's teammate, Peter Revson, an Easter-ner obviously suffering from the heat, swigged down a glass of Gatorade, sucked on a carrot and it helped. Ah, how technical race preparation becomes.

The Mission Bell 250 clanged off 13 minutes late and Donohue breezed into the lead pulling steadily away from Titus who pulled steadily away from the rest of the pack. Donohue continued inexorably to inch ahead until lap 12 when Jerry zoomed up on his bumper and passed him on the outside of turn 9, squirting away like a grasshopper. As you know, grasshoppers don't squirt too far for sustained bursts and neither did Titus, crashing the engine two laps later. Unruffled, Donohue whirred on.

One look at a Penske pit stop and you know why they won all those races. Suddenly, the Wood Brothers have an authorized instant service branch outlet in Pennsylvania. Penske may even be one up on the Brothers with a kind of drag racer's super cool-can, a 30-gallon fuel tank mounted inside a 55-gallon drum and packed with acetone and dry ice to keep the 260 Sunoco fuel at 42° F. On a hot day, fuel contraction is such that 23 gallons can be pumped into a 22-gallon tank. The advantage Donohue gets from the cool fuel is difficult to calculate since his Camaro holds the track record for gas gulping as well as speed but he might otherwise be seriously handicapped.

The intense heat exacted a terrible toll. Temperature and oil pressure gauges replaced the tachometer as a speed governor—the higher the former got, the lower the latter became and the slower you went. Follmer dropped out after Titus with the bottom of his chassis covered with oil and remarked tersely, "My engine got hot, too hot." With two rapid pit stops of 10 and nine seconds behind, Donohue's seemingly invincible machine began smoking and finally retired on lap 60 with a burned piston. A surprised Horst Kwech inherited the lead in the second team Mustang, Revson was second and Fisher in the Firebird was third. The order remained unchanged to the finish.

Undoubtedly, Fisher's performance was one of the highlights of the meeting. Forced to start in 32nd position because he burned a piston during practice and never qualified, Craig fired up the new engine Godsall's crew had installed overnight, and slithered through traffic like a Japanese taxi driver. When the checkered flag fell, Fisher was running stronger than Kwech or Revson but couldn't quite make up the distance. Second contender for outstanding effort was Jon Ward, a young sprint and stock car driver from Saugus, Calif., who bought his own Camaro, built it according to the SCCA rule book without ever seeing one of Penske's, and finished an amazing 4th overall. Yes, Virginia, like Pete Estes says, Z-28 Camaros are competitive off the assembly-line.

Just to keep everybody honest, SCCA elected to have the first four cars in each class torn down and to everyone's credit, no irregularities were found. In retrospect, AMC was still eight points behind Ford and the battle to be No. 2 would have to go right down to the wire at Kent. As the sun slid down the western sky people wondered if, AMC would lose in the end, what Pontiac's fortunes would be, and if Australian Horst Kwech, whose steady going in the Mustang had kept Ford alive, might be the next star on the horizon. It's been a weird year. /MT

Order of finish: 1 — Horst Kwech, Mustang — average speed, 94.9 mph; 2 — Peter Revson, Javelin; 3 — Craig Fisher, Firebird; 4 — Jon Ward, Camaro; 5 — Vic Provenzano, Alfa Romeo; 6 — Fred Baker, Porsche; 7 — Malcolm Starr, Mustang; 8 — Ron Bucknum/Dan Parkinson, Camaro; 10 — Del Taylor/Check Towbridge, Alfa Romeo.



(Above), Lew Spencer, Shelby's team manager, talks to a subdued Carroll before the race. Long years of competition, rise from obscurity to fame have weathered rugged Texan's face. All-time hot item for Chevys is dual 4-barrel, cross-ram manifold. 650 cfm Holley carburetors have dual accelerator pumps. SCCA tech man Jack Parcells (right), checks winning Ford's valves. All legal eagle.



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Trends in Travel



by V. Lee Oertle

Even though most states boost the idea of tired drivers pulling off the road for a "safety nap," they don't really mean an overnight stop. In fact, 13 states either prohibit overnight stopping along highways or impose special restrictions. In some states, it is taboo along any highway, and in others, stopping is permitted "only in emergency," to quote the code. Some other states, such as Montana, may allow overnight stopping if posted signs authorize it. So don't be surprised if you're roused from deep sleep along some dark roadway and asked to move along.

Roadside rests officially designated as such can be used for temporary stopping only. Setting up tents or throwing out sleeping cots in such areas may bring down the Highway Patrol. It's tough on travelers, perhaps, but the fact is that roadside rest facilities seem designed for cat-napping only.

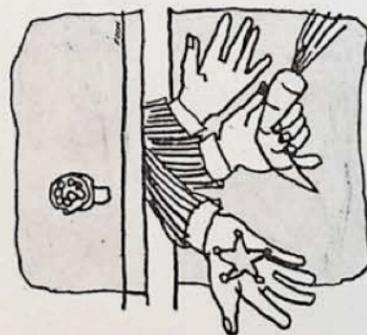
Traveling with a 4x4, sand buggy or motorcycle this season? Watch out for a hazardous problem with extra fuel containers. Several persons have been hurt when plastic fuel containers were strapped on the cycle frame adjacent to the exhaust pipe. Heat from the exhaust pipe melts the plastic which can then explode the gasoline. Virtually the same thing can happen when fuel cans strapped to 4x4 and buggy-vehicles spill or leaks onto a hot exhaust pipe. A pair of California hunters had to abandon their 4x4 vehicle when exactly that situation occurred. They bailed out seconds before the fuel tank exploded, which then set a forest afire. Moral: use extra caution when securing spare fuel containers—and buy the strongest containers you can find!

Towing a boat behind your car? Check it regularly in your rear-view mirror. Police in Ontario (California) found a boat squatting in the left-turn lane entering the San Bernardino Freeway—minus the towing vehicle!

"It looked like it was waiting for the light to change," officers reported. The

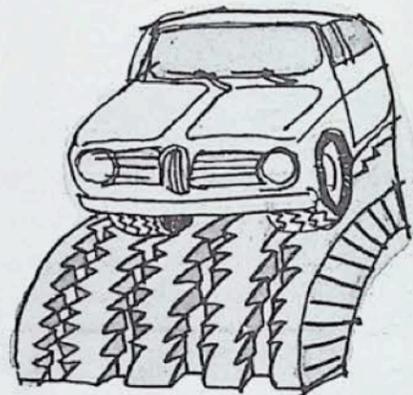
boat had fallen off its trailer at that point. Amazingly, the driver did not notice his loss until Highway Patrolmen caught up with him near a desert town nearly 100 miles away. He quickly drove back to the spot indicated by police, retrieved his unharmed boat, and continued on his way. (With one eye glued to the mirror?)

Some day, travelers and vacationers will be able to take long and complicated cross-country motoring trips without worrying about fouled-up routing. The days of wrong turns and dead-end roads are numbered. Detroit engineers are working on the actual hardware for a new "route guidance system" which will operate electronically. At the start of a typical tour, a driver would dial his destination code into the route-guidance equipment installed in his car. As the car passes key points along the route the unit transmits the code to robot stations along the way, which in turn advises the driver of the correct route to follow, or turn to make. This will be done either visually or by audio control inside the car. Such robot stations could also be tied in with electronic traffic-recorders to give spot-warnings to approaching drivers of a congested situation, and possible alternate routes to use.



Don't try to dodge those "highway inspection stations" while you're traveling. In some states officers will give chase. To illustrate the hazards of inspection duty, police in one state recently waved a driver into their inspection area—but she ignored the order and sped away at high speed. Police gave chase, caught the lady, and ordered her to drive back to the inspection station. Instead, she took off again in the opposite direction. Police caught up again at her home, where she locked herself inside. Police tried persuasion, but the lady wouldn't leave her sanctuary. When police tried to enter, one got his hand caught in the door. A second officer was splashed with a pot of boiling carrots, suffering burns on chest and shoulder. Police finally coaxed the woman outside, deposited her in an institution for the mentally unbalanced, and went away muttering about "crazy drivers." Maybe that time they were right!

Report a stolen or lost credit card immediately, unless you want to pay for goods purchased by the finder of your credit card. The going rate among bunko-artists is \$50 to \$250 for a stolen credit card. So while you're on the road keep a sharp eye on that card. Maybe the attendant "forgot" to return your card after you signed the receipt—or maybe he's one of those who specialize in snagging and selling credit cards. Report lost or stolen cards by telephone or telegram promptly! Cut up outdated credit cards with scissors. Credit cards are like hard cash. Don't leave them lying around!



drawings by George Foon

The roads of the future may consist of a mixture of rubber and asphalt. The combination has been tested in well over 10,000 miles of rubber-based highways, and the surface offers better wearability and improved skid resistance. Theoretically, a good rubber highway would mesh with a good rubber tire to form an almost perfect traction and braking surface. Speeding vehicles should be safer, lane-changing more sure footed, and in bad weather those rubber-cushioned roads ought to resist skidding much better.

This is the best season in which to travel, since there is less traffic on interstate highways. But it's also a time of ice and snow and rain. The slush and muck thrown up off the tires of cars ahead splatters windshields. Gas station attendants often leave an oily residue behind when they finish cleaning off the spatters, and the problem has proved a stubborn one for Detroit engineers. However, GM feels that they have the answer in a new wiper fluid they call Optikleen. They describe it as an all-weather washer fluid which contains a special chemical ingredient which not only flushes away dirt but also dissolves and removes invisible contaminants which, GM engineers discovered, were causing the lacy film which makes vision so difficult in rainy or sloppy weather. GM has begun using this special fluid in the windshield washer reservoirs of new models, and it is also available through dealers for other makes of cars. /MT

1969 Buick GS350.



Enthusiasts. Get enthused.

At last, a genuine performance machine that doesn't rattle your molars every time you're stopped at a traffic light. It's the 1969 Buick GS350.

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Get enthused. Over 350 cubic inches of V8. A 280 horsepower V8 that delivers 375 foot/pounds of torque and breathes deep and cool through a matched set of functional hood scoops. While a four-barrel quadrajet carburetor supplies the combustibles.

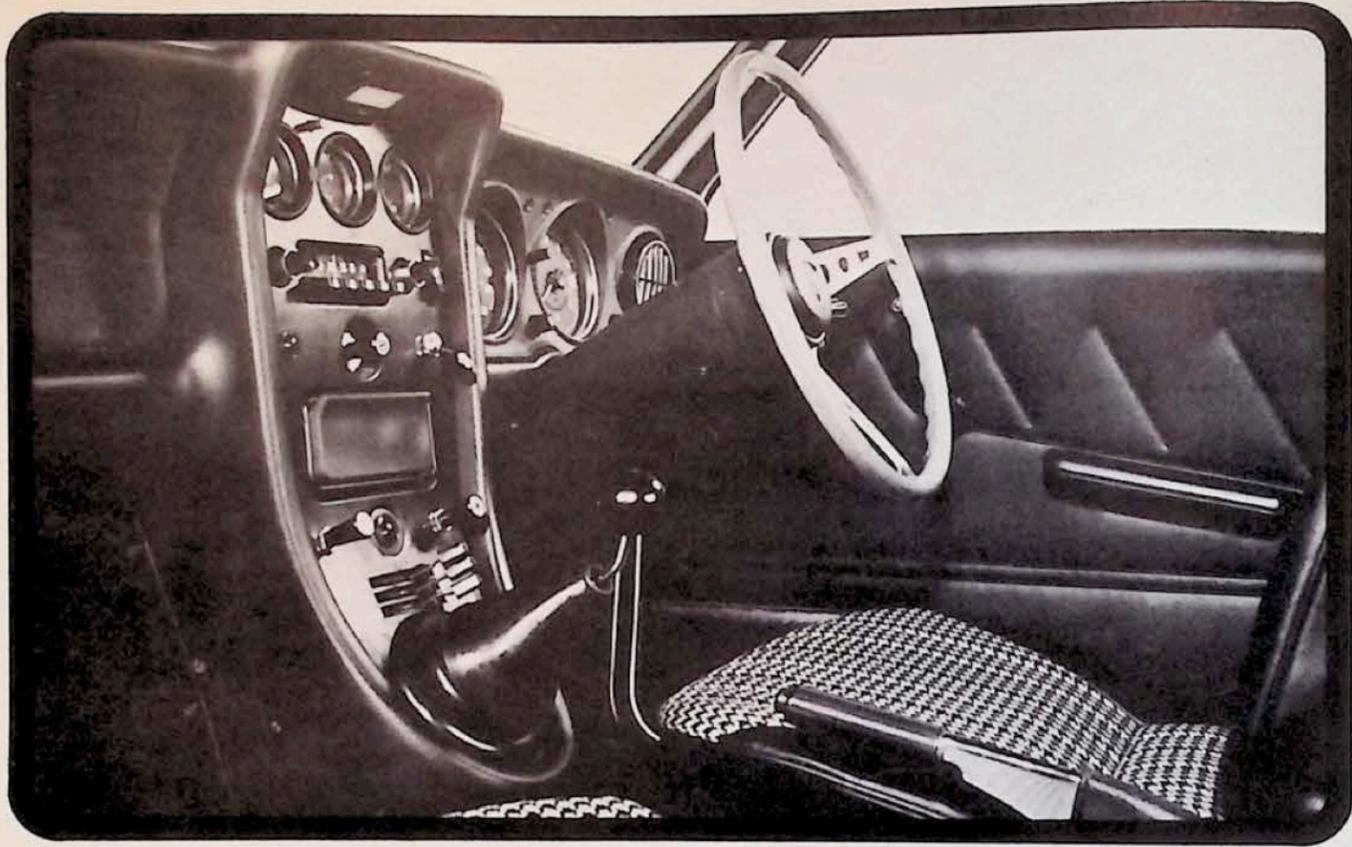
You can add a close ratio floor shift with linkage by Hurst. And a tight yet well-behaved rally suspension with a front

stabilizer bar. And all-vinyl bucket seats.

And confidence that's built right in by GM. With deep, foam padding on the instrument panel, an energy-absorbing steering column and a new ignition, steering and transmission control lock to keep less ethical enthusiasts from taking an impromptu demo drive.

Enthusiast. Get enthused. Take your enthusiasm to your Buick dealer. Then take it right back out with you. With a 1969 Buick GS350.

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Chicken Little was right. See it now, the whole world coming right down around our heads. Underground press publications outselling standard journals, perceptive youth exposing generations of political chicanery, and now a \$1900 Japanese sedan with a revolutionary—literally revolutionary—980cc engine that will wipe out a Buick GS400 in the quarter mile. It's Toyo Kogyo's R100 Mazda, the David of the auto industry, and its rotary engine is the sling, winding out 100 hp at 7000 rpm for a top speed of 112 mph.

It uses a brazen little 2-door, 4-place body that is better looking than any of its competitors we can think of, and an instrument panel that's barely discernible from the Lamborghini 400GT—full instrumentation, console and wood steering wheel. And meanwhile, back in Detroit....?

MAZDA: THE CRYSTAL BALL CAR

The Japanese seem to be the only ones able to put other peoples' ideas years ahead

by Julian G. Schmidt

Ours is a skeptical public—one that cannot accept the fact that burning has proved singularly unhelpful in stamping out unorthodoxy. But Toyo Kogyo does not consist only of ivory tower idealists, even though the Mazda R100 is the product of superior thinking. They'll wait until we're ready, but in the meantime they won't fold. They've taken the same body (except for grille) as the R100, renamed it the 1200, and inserted one of those pedestrian, conventional, overhead cam, 4-cyl. 1169cc 4-cycles that produces 68 hp at 6000 rpm and turns the quarter in 18.1 seconds. It has an 89-inch wheelbase, 149-inch overall length and a smooth ride. The braking system includes discs in front, and the interior has a wood-grained steering wheel, tach, and fully reclinable front seats with adjustable headrests... for \$1528 U.S. list price. They can make it hurt. /MT

Suggested for mature audiences.



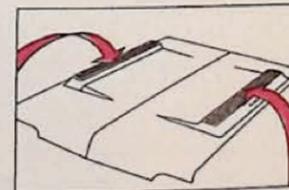
Plymouth



1969 Plymouth GTX

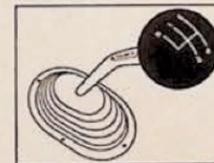
Plymouth GTX. As a member of an elite group, you crave the finer things in life. You know, the beach in the spring. The Strip. Miniskirts. Neat cars. Blood rare steaks. Things like that.

Well, we have good news for you. The Boss is back. Bossier than ever. There's a new Air Grabber option that lets the engine breathe cool air through the hood scoops.



Since cool air contains more oxygen, the engine runs stronger. (A shutoff control underneath the dash lets you stop the flow of outside air whenever you want to.)

There are a variety of new high-performance axle packages you can order. Ratios now extend from 3.54 to 4.10:1 for better acceleration in all gears.



We've also included goodies like a Hurst shifter (so you take less time going through the gears), a heavy-duty radiator with viscous-drive fan (more power ends up at the wheels), a dual-breaker distributor (better spark), and a Sure-Grip differential (maximum traction).

You still get our terrific 440 cubic inch Super Commando engine with 4-barrel carburetor, performance cam, extra large throttle bores, and oversize ports and valves.

One of the nicest things about the high-performance GTX is the luxury that comes along with it. Deep foam buckets and deluxe all-vinyl interiors.

Maturity *does* have its benefits, doesn't it?

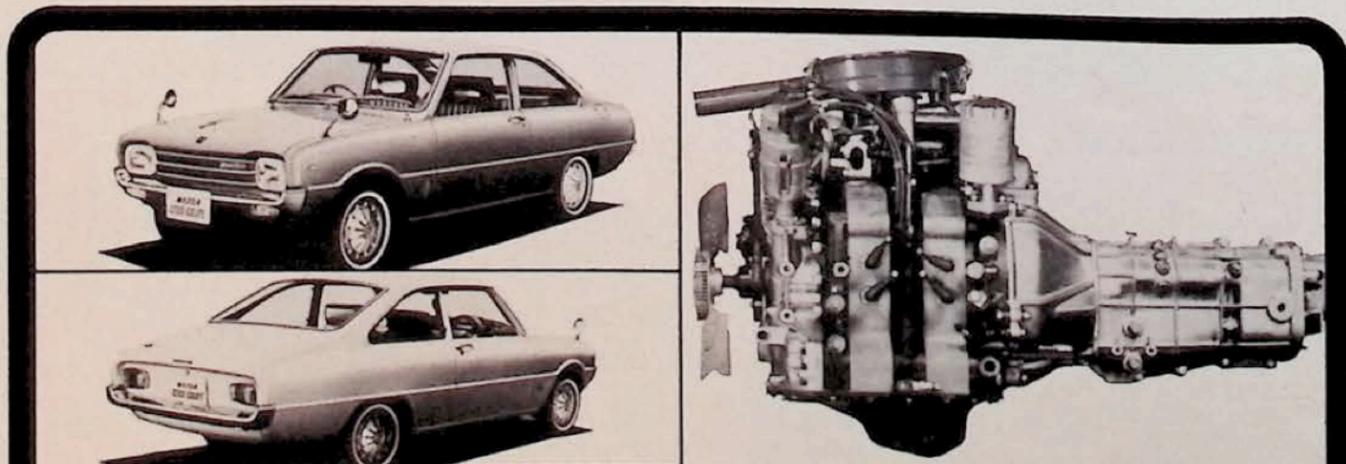
Deep foam buckets and deluxe all-vinyl interiors.

Maturity *does* have its benefits, doesn't it?



Look what Plymouth's up to now.

Watch AFL Football on NBC-TV.



(Top) Mazda 1200 Coupe is Toyo Kogyo's answer to the lethargy of the American market. It's powered by an advanced push-pull 4-stroke. It uses the same body as the exciting R100 Coupe, and has a great cost advantage.

Twin-rotor, 3-lobe, one-liter rotary Wankel engine puts out fantastic horsepower for the R100 Coupe, and propels it to a top speed of 112 mph. Car will do quarter-mile in 16.4 seconds. Power is 100 at 7000 rpm, and you cannot throw a rod.



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LITTLE OLD
LADIES.**



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FOUR-WHEELERS IN BIGGEST RALLYE; PISMO BEACH EVENT ATTRACTS THOUSANDS

By Jack Scagnatti

There's been a lot of publicity the past year on the explosion of dune buggy building and its related off-road activity. Perhaps because their vehicles are not as new and as colorful as dune buggies, 4-wheel-drive enthusiasts haven't been in the automotive spotlight as dramatically. Organized off-road activities, however, are proving that the 4-wheelers are an enthusiastic group with a growing legion of joiners. This was particularly evident at the "Pismo '68" event sponsored by the California Association of Four-Wheel-Drive Clubs, Inc. It was the eighth annual rallye and the biggest ever, and the biggest gathering of 4-wheel-drive enthusiasts this year. A total of 700 4-wheel-drive vehicles—Jeeps, Broncos, International Scouts and custom-built experimental vehicles—were registered for organized activity, according to Charlie Erickson, rallye chairman. Some 300 other 4-wheel vehicles were reported at Pismo Beach, a long stretch that is situated about 100 miles north of Santa Barbara in California.

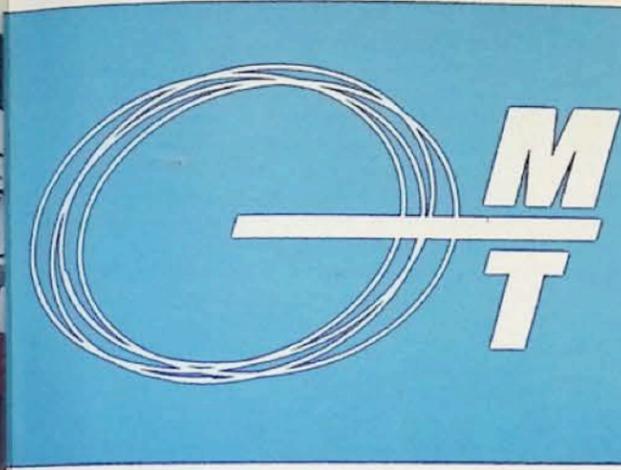
"We're quite certain an estimated 12,000 4-wheelers were in attendance," said Erickson. He said they came from 89 clubs in the California association plus clubs from Oregon, Washington, Arizona and Nevada. Some 9000 tents, campers and camper trailers—about 3000 per day for the 3-day event—were counted by state beach officials.

The 4-wheelers, the majority of them in family groups and camping together with fellow club members, mostly stayed overnight right on the beach front where vehicles could be driven and parked within a few yards of the ocean. They had a full schedule of organized activities. One hundred vehicles competed in an obstacle course run. Seen in competition were many vehicles that had participated in the Riverside (Calif.) Four-Wheel-Drive Grand Prix, the National Off-Road Racing Association's Stardust 7-11 race in Las Vegas, and the Mint "400" in Las Vegas. The well-known Baja Boot GM experimental vehicle also competed. A sand drag racing event was also held, with 183 4-wheelers competing. The vehicles were launched at the starting line for the 100-yard run via a Christmas tree (Chrondek) starting system. A total of 138 drivers competed in an organized hillclimbing event. All three events were for trophies and fun only. Although a great number of vehicles were at the beach during the three days, which was Labor Day weekend with a total of 164,000 persons reported at Pismo, there were no serious injuries involving the 4-wheelers. The 4-wheelers also proved that they were a neat, organized group by staging a camp decorating contest. The Four-Wheelers of Orange County won first prize with an interesting Indian camp design. /MT

(Right) Hillclimbing and obstacle course runs were included in 3-day rallye of 4-wheelers at Pismo Beach. Action like this attracted several hundred vehicles and spectators.

(Below) Campers, trailers and tents lined the beach for several miles. Many dune buggies were also on the scene for fun, but no organized activity was planned for the buggies.





by Bill Sanders

4-CAR TEST

Oldsmobile Delta 88 Custom

Pontiac Bonneville

Buick Wildcat

Chrysler Newport Custom

Oldsmobile Delta 88 Custom

Twenty years later the "Rocket" concedes some of its virility... but luxury and comfort can make you forget.



Twenty years ago it started out as the "Rocket 88." It was the hot bomb of its day; the first "supercar" of the post war generation. And, it went like hell. A lot has happened in the intervening years; cars have come and gone. But, like some Darwinian law of survival of the fittest by adaptation, the "88" has evolved and continued. Now, in this twentieth anniversary year, it's the Delta 88, the Delta 88 Custom, or the newly-created, top-of-the-line hardtop coupe, the Delta 88 Royale.

No longer the one-and-only, reigning-supreme, superbomb, the "88" has settled into its present role as a middle-class, luxury accommodated set of wheels with grace and fortitude. If first impressions are usually correct, we presuppose the "88" will have a good year in '69. We thought it was one of the best restyling jobs presented on the annual new model preview tour. Now, after testing a Delta 88 Custom, we still have the same enthusiastic disposition towards its looks, and, can now include performance.

Powertrain & Performance

No startling changes have appeared in powertrain systems for the "88" series in 1969. Oldsmobile has continued with the same theory that worked so well in '68 to combine performance and economy; lots of cubic inches and a high rear axle ratio. Our test car had the biggest engine, the 455-inch, that Olds puts out. This was their low compression (9.0:1) version with 2-barrel carburetor. The fact that this engine only needs regular fuel is a big selling point. Even on regular gas, performance figures were good. The car seemed somewhat slower than those running 4-barrel carburetors, but passing power was excellent and our test car laid some rubber on every fast acceleration start. Performance has to be considered good when you figure the engine is only

pushing out 310 hp @ 4200 rpm, and that coupled to a 2.56:1 rear axle ratio. The secret lies in the beefy 490 lbs.-ft. of torque @ 2400 rpm. Oldsmobile's theory works well as we discovered on the '68 models. You can run all the power options and push the rather heavy, solid "88" at highway cruising speeds and still get relatively better than average mileage.

Not content to remain status quo in any area though, Olds has made improvements in choke operation on all 2-barrel engines in '69. These improvements are said to result in better cold starts, improved fuel economy and reduced exhaust emissions. The new choke system is operated by a more powerful vacuum diaphragm and is more precisely matched to engine performance requirements.

Handling, Steering & Stopping

Although the "88" is a comparatively big car, with a 124-inch wheelbase, it is quite easy to maneuver, even on a demanding, twisting road. In fact, handling and steering are decidedly better in 1969, even though no major chassis changes have been made. Several factors contribute to the better handling qualities, the principal one being the optional, variable ratio power steering that's available in 1969. Secondly, there have been some minor suspension changes made to produce a softer and more comfortable ride, but even these changes have some effect on handling.

A moderate, built-in understeer is still evident, and cornering is quite level and flat, even when pushing it. Standard tire size has been increased in '69 and wheel diameter is back up to 15 inches, which also helps handling. High-speed, expressway cruising around 70 mph is effortless and ride and handling seem near perfection. Although the "88" is longer than it was in 1968, you actually get the impression it's a small-

Photos by Bill Sanders



(Opposite page, far left) With a carryover chassis, handling characteristics are quite similar to '68, including built-in understeer. (Above) With 4-wheel drums, '88 stopped better than Newport or Bonneville, but went 2 feet farther than Wildcat on 60 to 0 stop. (Right) Front seats are contoured similar to Wildcat, but '88 instrument panel has better design than Bonneville, Wildcat or Newport. Tilt steering, ignition, location are same on all GM cars. (Below) Definitive style changes are apparent in '69. Semi-fastback style has given way to more angular roofline. Vent windows have disappeared, but grille is still identifiable Oldsmobile.



M 4-CAR TEST

er car. Maybe it's the lack of vent windows or the change from the semi-fast-back roofline, or a combination. Even at 120 mph on GM's high-speed test track, ride was smooth and comfortable with very little wind or road noise when windows were up.

Variable ratio power steering is a worthwhile option, although it feels strange at first on the '88." We didn't know our test car was equipped with this option until after the test, but were aware of some change in handling characteristics. There is a tendency in hard cornering (much harder than would ever occur even in the most aggressive normal driving), to overcorrect, which

requires a lot of attention not to whip around too much. However, after a spell behind the wheel and it's mastered, handling and steering are much more precise and positive. The number of turns lock-to-lock have been decreased from 4.1 to 3.2, and to an average driver, the added responsiveness should be a definite advantage. Steering ratio goes from 16:1 to 12:1, while the standard power steering ratio is 17.5:1.

Our test car had power drum brakes front and rear. Oldsmobile's excellent stopping ability is evident again in '69. Full lock-up panic stops from 30 and 60 mph pulled the car down evenly every time, with only the slightest swerve noticeable during the 60 mph stops. Continued high-speed stops during our acceleration runs had little fading effect on brakes.

Comfort, Convenience & Ride

Luxuriousness and comfort continue to be highlights of Fisher body cars. Extra interior padding has been added in '69, and the instrument panel consists of four square pods containing the usual warning lights and speedometer/odometer in the center. If the tilt steering wheel is adjusted low for straight-on steering, the wheel obstructs most of the instruments and speedometer.

Optional cruise control has been standardized à la the F85, with the simplified operating button located in the end of the turn signal lever.

Front seat comfort is excellent, with lots of leg room. But, even with the elimination of the semi-fastback styling on the 2-door hardtop coupe, rear seat headroom is almost nil, and the same is true for leg and knee room. A 6-footer

will rub his head on the headliner if he sits up straight.

Trunk space has been increased in '69, but the spare is still far forward and difficult to reach. Electrically operated radio antennas now disappear into the fender, which should eliminate a lot of missing antennas when you park on the street overnight.

Suspension changes have been made to give a more comfortable ride. Spring rates have been changed, with front springs getting a 10% lower rate and rear springs a 10% higher rate, which results in a softer ride. The '88" frame has been altered with changes in front and rear control arm attachment points, and body stiffness has also been increased. In addition to a softer ride, these changes also have lowered the car 4/10-inch in 1969. This gives a lower

overall carrying height to the car and a better carrying height loaded or unloaded by maintaining a more level attitude. Shocks have also been recalibrated for the new spring rates.

Rear suspension geometry has also been altered slightly, which allows the rear axle to move through a flatter arc and reduces the fore and aft input to both engine and car.

Plus & Minus Features

GM seat belts and shoulder harnesses now have different size buckles so you won't confuse the big mess of belting around you, and it's a stab in the right direction at least. Wider rear-view mirrors are also much safer and convenient. Standardizing cruise control is a good idea, plus the location in the turn signal lever is much more convenient

than having to reach to the instrument panel. A pushbutton ashtray is also a good idea; you don't risk the chance of ending up with a floor full of butts and ashes as you do with the pull-out type ashtray. And, lastly, 1969 styling can't be omitted as a plus.

Spare tire location in the trunk could and should be changed to make it more accessible. The seemingly yearly decrease in rear seat head, leg and knee room is mystifying when cars keep getting longer and wider. This situation is most noticeable in 2-door coupes.

The restyled '88" is an impressive car with few shortcomings. It's no ton of sheetmetal 'blah,' but has an individuality and personality of its own. It starts fast, stops the same way, should get good mileage, rides comfortably and smoothly. Not bad for an ex-supercar.

Pontiac Bonneville

It may be far removed from the activities of that place that gave it a name, but the '69 Bonneville is definitely a luxurious road car.

Its namesake is a desolate area out in the Utah desert that immediately brings to mind Craig Breedlove stuck in a ditch or Paul Bryan running for his life. You think of speed and world records. Pontiac is keeping up the pretense of association, with a big engine for the Bonneville, but in 1969 the name of the game is longer and wider—with lots of posh thrown in for that great big affluent market waiting in the wings.

Pontiac has given the Bonneville individual treatment in '69 that features a separate and distinct grille and a rear bumper with a rubber-like pad. Vent windows have been subtracted from all Bonneville models, adding more visibility and a sense of roominess.

The Bonneville has a die-cast grille separate and distinct from other Pontiacs that's surrounded by a center section of the now famous rubber-like plastic material, Endura, which splits both the grille and the bumper, setting a dominant theme.

Restyling emphasizes the new side appearance and the new roofline. Sides are accented with vinyl plastic moldings which contain front and rear side markers. The Bonneville wheelbase has

been lengthened to 125 inches in 1969, that's an inch increase over last year. Overall length has also increased one-half inch to 224 inches for the Bonnie. Overall width is 79 inches and overall height is 54.8 inches. Wide-track town has also moved its city limits. Track is one-inch wider at the front, making it 64 inches both front and rear.

Powertrain & Performance

In line with the individuality theme, Pontiac has blessed the Bonneville with the top-of-the-line 428 cubic inch V-8 as standard equipment. The 428 turned out 360 hp @ 4600 rpm, with torque rated at 472 lbs.-ft. @ 3200 rpm. The standard also includes a 4-barrel carburetor and 10.5:1 compression.

Getting from here to there in a hurry was faster than one might expect with a big 4-door hardtop. Acceleration times were good, and one run of 0 to 60 mph broke through the 10-second barrier with a 9.8-second stopwatch time. Times must also be considered good since our test car also has a fairly high rear axle ratio of 3.08:1.

Acceleration times were quite close with air-conditioning both on and off, which surprised us somewhat. The big

engine can handle all the power options without any problem. That also gives an added margin of safety for passing with air-conditioning going wide open.

Our test car had the Turbo Hydramatic transmission which functioned effortlessly for our acceleration runs. Manual downshifting gives good braking assistance without excessive jerking or lurching.

Handling, Steering & Stopping

Slip behind the wheel, and sticking out there in front of you, extending it seems into the next block, is a hood only slightly shorter than the Grand Prix. Heading it into the traffic of a busy street is an awesome feeling at first. A look around and there's no doubt about it, the Bonneville is a helluva big car. Once on the open road though, you can settle back; the Bonneville handles good, like a big car should. It holds the road flat like some big D-8 Cat and only sways a little when pushed hard into a corner. Cruising qualities are excellent, with no mushiness or wallowing in dips. There is even a reassuring, although slight, road feel through the steering wheel.

We were ready for the variable ratio power steering when we tested the Bonneville and it made handling the big set of wheels an enjoyable experience. The overall ratio goes from 19.5:1 to 14.3:1 on the Bonneville, with 3.5 turns, lock-to-lock, so it isn't quite as noticeable as the new option on the Olds 88. With 8.55 x 15 tires as standard, variable ratio power steering, and the mild, built-in understeer, it makes a good road car, whether on a freeway or in the mountains.

Front brakes were GM's new single

Photos by Bill Sanders

(Top left) New rubber-like pad on Bonneville rear bumper should protect against minor parking accidents, is good feature other three cars don't have. (Top right)

Rear seat leg and knee room is lacking in Bonneville, as it is in each car tested. Dash layout is well planned and better than Wildcat or Newport. (Center) Big style change is in the Grand Prix, so Bonneville retains many '68 characteristics. Bonneville and Wildcat have similar appearance. Best restyle job is on Olds 88.

(Bottom left) Protective Endura snout in center of Bonneville grille may eliminate unwanted dents, but eek what a beak. Other three cars have much more attractive grille treatment. (Bottom right) Bonneville glovebox is way down under on '69 dash panel. New interior trim adds to luxury appeal; absence of vent windows on 4-door gives big, roomy feel.



M/T 4-CAR TEST

piston discs and stopping was nearly faultless for a car this size. There was some noticeable, although fully controllable, swerve in panic stops from both 30 and 60 mph.

Comfort, Convenience & Ride

If you want comfort, you've got it with the '69 Bonneville. The interior quality has also improved with the use of new materials. Thicker foam pad-

ding has been added to the instrument panel, going across the entire width, and blending into the windshield pillars. The speedometer is large and easy to read. A new systems monitoring panel of lights is located in the left top portion of the dash but is obscured by the steering wheel at times, depending on seat height.

For heavy smokers, the ashtray is large and centrally located on the dash. But, the dash lighter is next to the steering column and somewhat difficult to reach by the front seat passenger. A separate passenger ashtray is located in the right front door armrest for extra convenience. The total dash layout is

interesting and both heater/air-conditioning and radio controls are on the right side of the steering column and easy to reach by the passenger.

Rear seat leg and knee room is emphatically restricted for a 4-door. Rear seat headroom, too, is lacking, and that also in a 4-door. Wearing a hat in the back seat is a lost cause if you're tall. Each rear door has its own ashtray, though they're small.

Quality control is top drawer. Materials, especially the brocade upholstery our car had, are sure to appeal to that woman power influence. The Bonneville Brougham option lets you pick an exclusive interior, including special bis-

cuit designed seats of molded foam rubber.

A welcome addition in '69 is the installation of a newly designed ignition system that should significantly reduce radio interference. This new system includes new spark plugs which contain a resistance element conductor instead of a solid metal conductor to eliminate electrostatic radiation from the ignition system.

You can also get some unusual items that Pontiac offers as optional accessories, such as the Instant-Aire portable air pump that's driven by the engine manifold vacuum and permits on-the-spot flat tire inflation. Also

available is a warning lamp option for the instrument cluster that consists of three lights. One is a seat belt reminder, another a low fuel warning light, and the third lights when headlights are left on and the ignition switch is off, good for those rainy, foggy days when dead batteries are common.

For safety's sake, the Bonneville, like other GM cars has a steel beam inside each door that provides greater protection against passenger compartment penetration in case of a side collision.

Plus & Minus Features

We like the ride and handling characteristics of the '69 Bonneville, with

variable ratio power steering, new bigger diameter tires, and the solid, quiet ride. Interior appointments, materials and quality control are also very impressive.

Spare tire location in the Bonneville trunk, like similar bodied GM cars, is too far forward to reach easily, especially for women. A 4-door hardtop should have more total passenger room than this one does, especially when overall dimensions have been increased.

For those who are hung-up with the "Bonneville Syndrome," as is one friend of ours, the 1969 version should give them a lot to talk about on cold winter nights.

Buick Wildcat

A redesigned suspension and big drum brakes make this luxury car a real performer

Ask the man who owns one. In 1969 that old Buick ad campaign comes on with manifest significance, especially when it pertains to the Wildcat. Let's face it, no one's been deluded by that name in recent years; few envision a screaming, clawing, tail snapping animal roaring out of the hills when it comes to Buick Wildcat. It's a friendly, all-American type, compromising automobile with lots of plush appointments and a suitably soft, springy ride we all enjoy so well. Like all the rest on the scene today, it's long and wide, although interior dimensions like knee and head room are noticeably deficient.

But, aha! Now comes the 1969 Wildcat. A newly conceived suspension modification, both fore and aft, gives the Wildcat vastly improved handling characteristics under all conditions. Ride and directional stability have also benefitted from the new suspension, but ride comfort has been maintained, and no harshness has appeared. The same suspension modifications have been applied to all big series Buicks. Of all manufacturers in this year of safety and non-change, Buick has to get some measure of acclamation for devoting their engineering energies toward an area that seems to have lost significance in the race for more padding, gimmicks and plebian esthetic values.

Powertrain & Performance

Standard powertrain for the Wildcat is basically unaltered from 1968. It's still powered by the biggest of the Buick engines in size, the 430 cubic inch V-8 with a 4-barrel carburetor and 10.25:1 compression. A 3-speed automatic transmission was included on our test car, but a 3-speed manual is standard on the Wildcat. Undoubtedly the percentage of standard transmissions sold with Wildcats will be infinitesimally small in 1969. Rear axle ratio on the test car was 3.07:1.

Rated at 360 hp, the big V-8 is well adapted to the Wildcat and moves it along better than we had anticipated. Several 0 to 60 times of 9.1 seconds and one at 9 seconds flat were impressive, as was the best quarter-mile time. Torque is solid at 475 lbs.-ft. @ 3200 rpm.

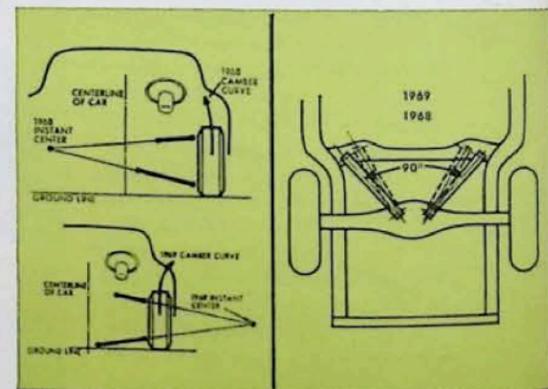
For 1969, Buick also offers a special trailer option package on the Wildcat. This includes a 3.42 performance rear axle ratio with Positraction, heavy-duty self-leveling "super-lift" shocks and an extra heavy-duty radiator that has an even more beefed up core than that used with air conditioning.

On all Wildcats, a unique "vibration damper" is now used to eliminate certain road shocks, caused by such things as freeway expansion joint ridges. The "vibration damper" allows a much smoother and comfortable ride. A simple concept, it's a weight bolted on the underside of the transmission near the driveshaft. It cuts down on propshaft vibrations that are normally transmitted into the engine.

Handling, Steering & Stopping

This is the area where Wildcat rightfully shines this year. Buick's primary goal was to achieve better directional stability for their cars by redesigning the suspension system. In the process,

they also improved handling to a noticeable degree. Variable ratio power steering has also become a standard item on the '69 Wildcat, and the combination of better handling and vastly su-



perior steering makes this car a great performer.

With more and more freeway driving, directional stability has become increasingly important at high speeds, particularly when fully loaded or in crosswinds. This theory also applies as cars get longer, to getting them around corners more easily and quickly without loss of control. Buick's new suspension is called "Tru-Trac." Basically, changes in camber of the front wheels as they move up and down over road bumps is used to keep the car going straight. When a rolling wheel is leaned or cambered, a side force between the ground and the tire is generated. This side force is called "camber thrust," and Buick now uses it as a stabilizing force. This stabilizing influence has been accomplished by both lowering the lower control arm inner pivot and raising the upper control arm inner pivot. When the wheel moves up and down, it rotates about an imaginary instant center



(Left, opposite page) Diagrams show suspension changes in '69. Instant center of front wheels is outboard and camber curve turns outward for better stability. Rear upper control arms have angle increased to 90°. (Above) Wildcat has delicate restyle job in '69. (Right above) Rear seat lighters are now located at each end of front seats, a unique idea, but lighters may prove difficult to use. (Right below) Limited rear seat dimensions approximate those of other cars tested. Knee and head room are inadequate for tall ones. (Far right) Extremely hard cornering on race track will throw plenty of lean and sway into Wildcat, but in normal driving, even in mountains, big car stays flat with new suspension changes. Ride is still smooth and comfortable. (Below) Wildly smoking tires are mute testimony to stopping ability of Wildcat. Even with drums at each corner, car stops beautifully.



Photos by Gerry Stiles



M/T 4-CAR TEST

which is the point of intersection of lines drawn through the control arms. In '68, this instant center was inboard of the wheel and the camber curve also turned inward. The '69 instant center is outboard of the wheel and the camber curve, or arc the wheel follows as it moves up and down, turns outward, which improves stability.

These changes keep front tires flat all the time, which affords better directional stability in wind or on uneven terrain. Better cornering ability also results. Since tires stay flat on the road,

side wear is diminished and should prolong tire life. Solid, roll-free cornering has also been helped with the front suspension stabilizer bar increased in size in 1969.

Wildcat rear suspension has received a modification that Buick calls "wide angle control." From a top view, rear upper control arms have been increased in angle from about 70° to 90°. This change improves lateral control at the rear and achieves a more solid, sure-footed handling response. Even when heavily loaded, there should be no lag of the tail end behind the front. This change reduces body sway on the chassis in cornering or wind for better control, and therefore, handling remains nimble and true.

Our test car had drum brakes at all

four corners, and panic stops left our mouth hanging open; stopping ability was phenomenal. A look underneath the Wildcat will explain the great stopping power. Buick uses finned aluminum front drums, and all brakes are 12-inch diameter instead of the usual 11 inches. Only Buick uses the aluminum front drums. Our stop of 141 feet from 60 mph caused four noticeable flat spots all around, but the car didn't veer the slightest in either direction at full lock-up.

Comfort, Convenience & Ride

Front seats are extremely comfortable and are bucket contoured. Six-way power adjustment puts the front seat in a perfect attitude for almost everyone. A moveable center armrest makes for

"Heah come de Judge"... and in '69 it's odds on he's probably making the scene in a Chrysler. And, unless he's on the Supreme Court, his car might just be the baby of the line, a Newport or Newport Custom. With a complete face lift for the entire Chrysler line, the relatively inexpensive Newport has emerged with an elegant look that will appeal not only to judges, but to doctors, lawyers, Indian Chiefs... and quite a few other upper middle class patriarchs too we suppose.

We were impressed with the sublimity of Chrysler product restyling when we first saw it, and after testing first the Plymouth Fury III and now the Newport Custom, we are still pleased. Simplicity is a testimonial to itself. After some of the monstrosities perpe-

trated in the late '50s, coincidental with the demise of the DeSoto, and the recent boxy look, Chrysler styling in 1969 is refreshing.

Chrysler thinking is apparent: if you can't beat 'em, join 'em. At a Detroit car wash, the foreman, when he saw the Newport coming through the line, called all the office personnel out for a look. His comment was succinct: "Man, that car's gonna give Cadillac some competition." When told it was a Newport, he was even more amazed. A group of Chrysler engineers had a Newport out in Detroit a few months before introduction. While they were parked briefly on a suburban street, some of the young neighborhood studs asked if it was an Oldsmobile. Two separate observations leave one con-

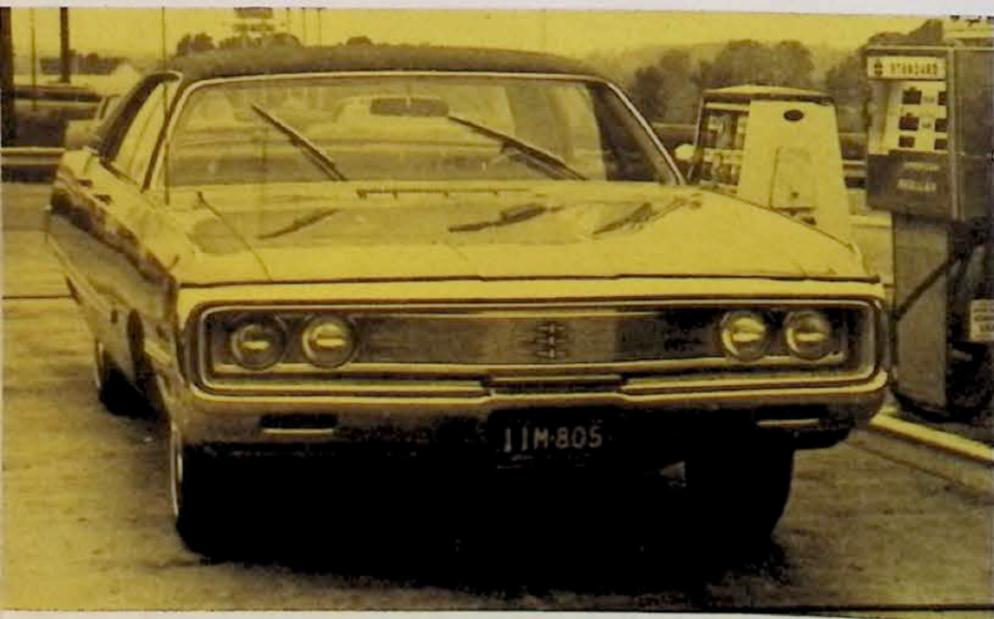
clusion: Chrysler styling innovations have moved in with perfect timing in a variation of the old game, follow the leader. As Cervantes said a few years ago: "Diligence is the mother of good fortune." If styling sells cars, Chrysler diligence will probably be rewarded with a whole mess of good fortune cookies, and that will be a real mother. While evolutionary is the big word in Detroit these days, Chrysler styling is revolutionary in its own way, even if only for its departure from previous concepts, but more for its cultivated taste.

Powertrain & Performance

Even though our test car had a 383 cubic inch engine with a 4-barrel carburetor, which automatically includes a

Chrysler Newport Custom

Styling is the story in '69 — with a look like you-know-who.



dual exhaust system, we doubt if many Newport Customs will make an attempt at integration with the slicks and mags set down at the corner drive-in. Camp it ain't, but it's got class. And, anyway, the drivers who'll be pushing a Newport Custom could care less.

Powertrain components on the big 4-door hardtop were basically standard with 330 hp @ 5000 rpm, an automatic transmission, and a 3.23:1 rear axle ratio. A full complement of power options were working off the engine; air-conditioning, power brakes, power steering, power windows and power door locks. And 425 lbs.-ft. torque @ 3200 rpm takes care of the added options.

Our test Newport was a prototype, which we picked up at the Chrysler product planning garage in Detroit for a tour of the now familiar Michigan countryside. Destination for the day was Lapeer, Mich., population 6160, and the

easy freeway driving, but with the armrest up, the front seat is as comfortable as a bench-type seat for three people. Rear seatbacks are also bucket contoured for extra back comfort, but like all the other cars in this category, rear knee, leg and head room are definitely lacking. Knee room did seem to be a little better than on other GM cars.

A recent trend with interior door handles has been the magic game of discovering the secret of how they operate so you can get out of the car. This isn't a problem on the Wildcat. Door handles are simple and easy to operate.

The instrument panel is fairly well laid out, but has a busy appearance, with no smooth pattern to the location of instruments and knobs. There is a large, easy to reach spot in the center

allocated to the power antenna button, while the windshield wiper/washer button is down at the base of the dash in a hard-to-reach location. There is also a separate, well placed switch for interior lights, but interior lights can also be operated off the headlight switch.

Rear seat leg room may be lacking, but they haven't scrimped on the cubic feet in the trunk, it's enormous. The jack is easy to reach, but forget about the spare. Like other GM cars, it's way up front there and you have to get into the trunk to get it out.

Plus & Minus Features

Obviously we're impressed by the redesigned suspension, which tops the plus list. Although handling has been improved, ride remains Buick comfort-

able and soft, with no harshness, road or wind noise encountered. Interior quality is also a plus, with rich brocade seat upholstery and matching vinyl door trim, as is the large trunk.

The front seat ashtray is poorly designed in the Wildcat with too much padding, which makes it difficult to open. Rear seat lighters are uniquely located at each end of the front seat and are convenient, but may be difficult to get out without burning the front seat on occasion. Again, rear seat measurements for legs and such are definitely too small.

We say hats off to Buick for their suspension changes that result in such improved ride and handling qualities. It's like a tiny oasis in that vast desert. Ask the man who owns one.

new Lapeer International Dragway, owned by Mike and Ed Vakula. Getting perfect performance figures on the Custom was a little difficult as it had rained all morning and the strip was still wet. Times were good though for a 4000-pound car loaded with accessories, and a 17.4-second quarter-mile shows some spunk for a non-performance machine.

Powertrain systems are virtually the same as those used in 1968, although a vibration damper has been added to the propshaft to cut down on shakes. The 383 engine with 4-barrel carburetor coupled to the 3.23:1 rear axle ratio gives the Custom plenty of power, but for fuel-conscious families, the standard 383 with 2-barrel carburetor and 2.76:1 rear axle will probably find a more welcome home, even if it won't lay a stretch of rubber when the light turns green.

Handling, Steering & Stopping

This is a big year for Chrysler in their change to a relevant, contemporary style. They've spent a lot of money re-making their cars... on the outside, where looks make an impression under the bright lights on a showroom floor. They're not alone in that respect, but with all the marbles going for new sheetmetal, no major improvements or changes have appeared in chassis or suspension.

Front torsion bars and rear leaf springs emulate 1968 handling characteristics in all driving situations. Mild,

(Opposite page) At a service station, filling it up isn't a fortune with the Newport. It's got the smallest gas tank of all cars tested, by one gallon. (Above right) In old Lapeer, smooth, simple lines of Newport blend harmoniously with ageless architecture. How styling concepts change. In '69 Newport and Bonneville 4-door sedans could pass for twins. (Below right) New instrument panel on Newport is still recessed. Watch those knees in the back seat if you have long legs.



M 4-CAR TEST

built-in understeer is apparent in turns and is more apparent the harder you push the car. With an aerodynamically improved body and a seemingly lower center of gravity, road hugging solidity imparts more handling confidence than was evident in '68. Moving up to larger tires (8.55 x 15) from the 14-inch diameter standard size used in '68 has also helped handling and road stability.

Overall length has been increased to 224.7 inches, five inches longer than 1968 models, but this increased length hasn't seemed to affect or hinder handling or steering qualities.

You can throw away that bottle of tranquilizers you've had stashed in your Chrysler glovebox; confidence has replaced trepidation—Chrysler brakes

have been improved in '69. A new self-adjuster has been adapted and operates when brakes are applied while in reverse. This self-adjuster should give longer life to linings. Optional front discs are now single-piston, floating caliper units made by Kelsey-Hayes. With drums up front, the drums are finned for better heat dissipation, and linings are grooved to reduce chatter. Flared drums are new in the rear for heat elimination and for improved lining life. Panic stops were noticeably better than in 1968, and after repeated high-speed stops and slowdowns, no burning odor or fade was evident, as occurred in '68.

Comfort, Convenience & Ride

Half the population may be under 26, but that fact holds no disdainful agony for Chrysler. The average age of their upper echelon market is somewhere around 48 or 50. Not too many dual intake manifold customers in that group

and Chrysler pursues their computed tastes with an increase in every interior dimension for more comfort and roominess. Rear seat leg room has been increased more than three inches in the 4-door hardtop, and in both front and rear, shoulder room has been increased more than three inches over 1968.

If there's an influence on the outside from that other company, it also is apparent inside. Seating is much lower in the Newport than it was in '68, giving a feeling of greater solidity and security. Lower seating is also more comfortable. The completely new instrument panel is still recessed, similar to '68, but redesigned toggle buttons are flush on the panel. Plenty of front seat leg room is available on both sides of the car, and the front seat looks about as wide as the Mississippi River at Clinton, Iowa.

Rear seat leg room in the 4-door hardtop, even though increased three

inches, is just adequate, and rather tight when the front seat is all the way back. Headroom in back leaves only a couple of inches clearance for us tall ones, but at least your head doesn't bump the headliner.

Windshield wipers are concealed in '69 and with articulated wipers, the wiped area on the windshield lower corner of the driver's side is extended about four inches. There is even a suspended accelerator pedal designed to facilitate cleaning the front floor.

A number of factors, such as the redesigned body, the lower seating attitude, the bigger tires, all combine to give the Newport a greatly improved, solid, comfortable ride in '69. And that's without any major suspension modifications.

Plus & Minus Features

Chrysler's restyle and redesign job, both outside and in are the biggest plus

features this year. Replacing the rather loose, shaky feel of '68 with a compact, solid feel in both ride and handling, without sacrificing, but rather increasing, comfort, has been a big step forward. Interior appointments and quality are both improved, and the low liftover of the Newport trunk is a plus for women. Improved brakes have to be big on the plus side, too.

Our test car was a hand-made prototype and some of the minus features will obviously be changed in production. However, the simulated chrome, plastic dash switches are rather gaudy. The deluxe steering wheel has a wide center bar that impedes steering at times, and restricts vision of the instrument panel. However, as a plus, the 1968 steering wheels which were made of polypropylene, a plastic material that has an oily feel to its texture, have been replaced by...butyrate, a synthetic that's good to the touch.



(Above) Even on wet pavement Newport lights up rear tires during acceleration, impressive for car with lowest torque ratio.

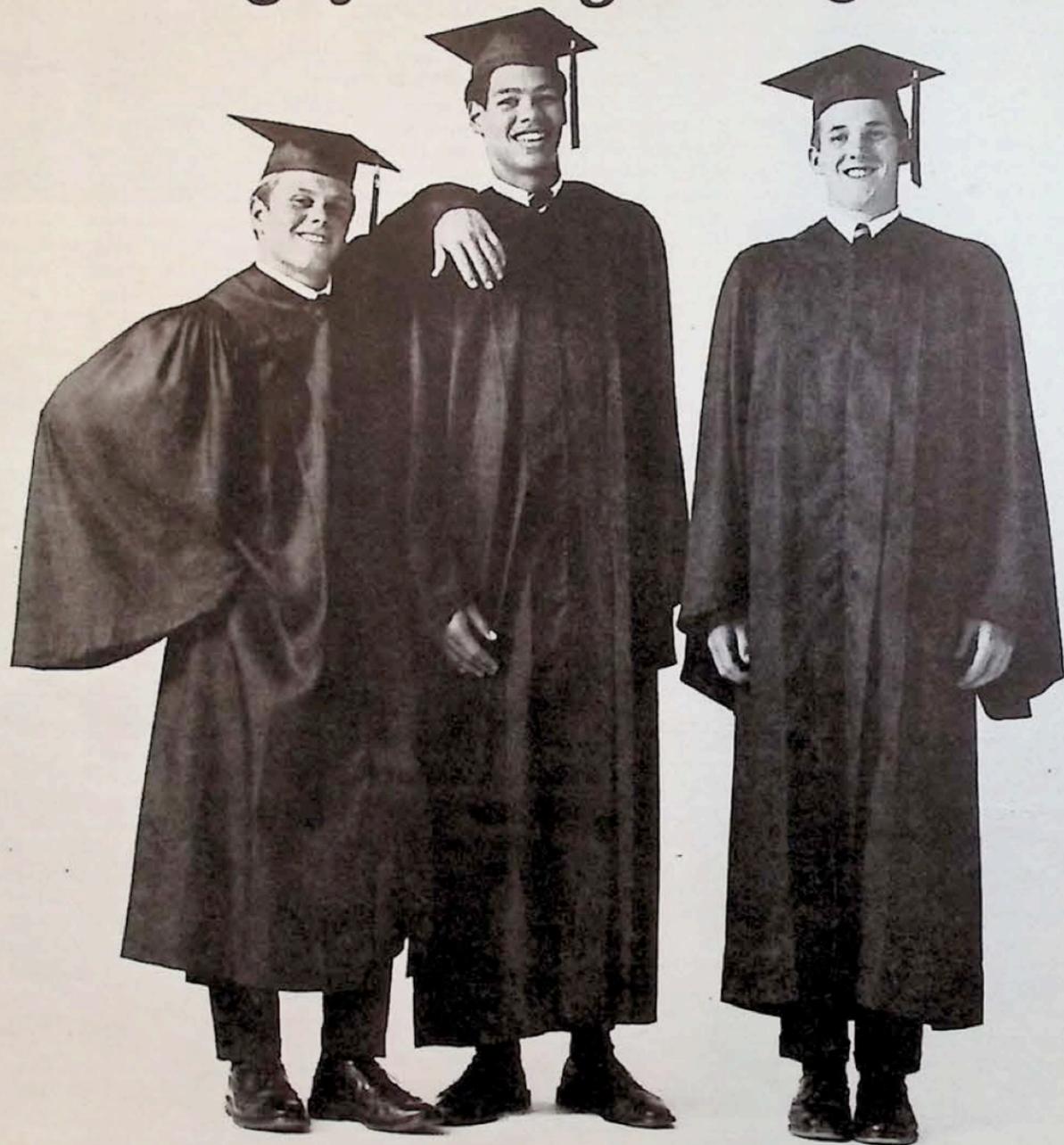
Comments from the people give the ultimate verdict on any car. Comments so far about the Newport seem indicative of a secure future in '69. /MT



	Delta Custom 88		Pontiac Bonneville		Buick Wildcat		Chrysler Newport Custom	
PERFORMANCE								
(Performance figures computed with and without air conditioning working)								
Acceleration (2 aboard)	With Air	Without Air	With Air	Without Air	With Air	Without Air	With Air	Without Air
0-30	3.4 secs.	3.2 secs.	4.0 secs.	3.6 secs.	3.6 secs.	3.5 secs.	4.5 secs.	4.0 secs.
0-45	6.5 secs.	6.2 secs.	7.0 secs.	6.5 secs.	6.0 secs.	5.6 secs.	7.5 secs.	6.6 secs.
0-60	10.4 secs.	10.0 secs.	10.2 secs.	9.8 secs.	9.6 secs.	9.0 secs.	11.6 secs.	11.2 secs.
0-75	16.0 secs.	15.2 secs.	15.4 secs.	14.9 secs.	13.8 secs.	13.0 secs.	17.2 secs.	16.8 secs.
Standing Start 1/4-Mile:	80 mph, 17.2 secs.		82 mph, 16.6 secs.		85.3 mph, 16.3 secs.		80 mph, 17.4 secs.	
Passing Speeds:								
40-60	6.0 secs.		5.1 secs.		4.8 secs.		5.5 secs.	
50-70	439.2 ft.		373.3 ft.		351.3 ft.		402.6 ft.	
	6.8 secs.		5.9 secs.		5.4 secs.		6.1 secs.	
	598.4 ft.		519.2 ft.		475.2 ft.		536.8 ft.	
Speeds in Gears:								
1st . . . mph @ rpm	54 @ 4200		46 @ 4600		49 @ 5000		46 @ 5000	
2nd . . . mph @ rpm	92 @ 4200		79 @ 4600		81 @ 5000		80 @ 5000	
3rd . . . mph @ rpm	104 @ 3800		102 @ 4000		94 @ 4000		90 @ 4000	
MPH Per 1000 RPM:	27.3 mph		25.5 mph		23.5 mph		20.2 mph	
Stopping Distances:								
From 30 mph	34 ft.		37 ft.		31 ft.		33 ft.	
From 60 mph	143 ft.		151 ft.		141 ft.		150 ft.	

	Delta Custom 88	Pontiac Bonneville	Buick Wildcat	Chrysler Newport Custom
SPECIFICATIONS				
Engine	90° OHV V-8	90° OHV V-8	90° OHV V-8	90° OHV V-8
Bore & Stroke—Ins.	4.126 x 4.250	4.12 x 4.00	4.187 x 3.900	4.25 x 3.38
Displacement—Cu. In.	455	428	430	383
HP at RPM	310 @ 4200	360 @ 4600	360 @ 5000	330 @ 5000
Torque: lbs.-ft. @ RPM	490 @ 2400	472 @ 3200	475 @ 3200	425 @ 3200
Compression Ratio	9.00:1	10.5:1	10.25:1	10.0:1
Carburetion	1 2-bbl.	1 4-bbl.	1 4-bbl.	1 4-bbl.
Transmission—Std.	Automatic	Automatic	Automatic	Automatic
Final Drive Ratio—Std.	2.56:1	3.08:1	3.07:1	3.23:1
Steering Type	Variable Ratio Power	Variable Ratio Power	Variable Ratio Power	Power
Steering Ratio	16.0:1—12.0:1	19.5:1—14.3:1	16.7:1—11.6:1	19.1:1
Turning Diameter—Curb-to-Curb—Ft.	45.4	43.7	44.3	44.3
Wheel Turns—Lock-to-Lock	3.2	3.5	3.3	3.5
Tires—Std.	8.55 x 15	8.55 x 15	8.55 x 15	8.55 x 15
Brakes:				
Front	Power Drum,	Power Front Disc,	Power Drum, front & rear	Front—Power Disc,
Rear	Front & Rear	Drum Rear		Drum Rear
Front Suspension	Independent w/coil springs & sway bar, front; solid axle coil spring w/4-bar linkage, rear	Ball joint independent w/upper & lower control arms, front; 4-link pivoted control arm, rear	Front-Coil springs & ball joints	Front—Torsion Bar
Rear Suspension			Rear-Coil springs & control arms	Rear—Parallel Longitudinal leaf springs
Body/Frame Construction	Frame/Body	Frame/Body	Frame/Body	Unit body w/stub frame
Overall Length—Ins.	218.6	224.0	218.5	224.7
Width—Ins.	79.9	79.0	79.5	79.2
Height—Ins.	54.7	54.8	55.3	55.7
Wheelbase—Ins.	124.0	125.0	123.2	124.0
Front Track—Ins.	62.5	64.0	63.4	62.1
Rear Track—Ins.	63.0	64.0	63.0	60.7
Curb Weight—Lbs.	4273	4208	4357	4030
Fuel Capacity—Gals.	25.0	26.5	25.0	24.0
Oil Capacity—Qts.	4.5	5.0	5.0	4.0

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THE TRANSVERSE ENGINE

by Karl Ludvigsen

Detroit's not sure you're ready yet for a car that's bigger on the inside, smaller on the outside. But when you are, they'll build it, with the help of the radical "east-west" engine layout.

As you read this, engineers and stylists are debating the shape and structure of the new cars they'll introduce in 1972. The debate is an unusually lively one. Certain trends have worked clearly and well in the auto market of the late Sixties: the high-performance street machines, the long-hood look, the Coke-bottle shape, the recessed rear window, the sporty cars and the logical intermediates. But what will best meet your needs and desires in 1972?

The market researchers are flooding the designers with new data, new predictions. Engineering for maximum crash protection will play a major role. Its demands on the car's interior space and body structure will continue to increase, since it takes space and strength to absorb crash energy. New recreational uses for cars — including camping — will demand more interior space, even enough for full-length beds and fold-down tables. Yet these needs will conflict with the increase in vehicle population and urban congestion that call for cars that are smaller overall. Smallness is already considered a virtue by many buyers, as the swelling import sales demonstrate.

There's one key to space-saving design, an important one: the use of an engine placed transversely, or "east-west" in place of the normal "north-south" alignment. Placing the engine across the car, rather than lengthwise, as it's usually done, drastically saves space in the vehicle package — especially if the engine is of the in-line type, either a four or a six. The saving is less dramatic with a conventional V-8 but still impressive and useful, especially considering the whole engine-gearbox assembly.

So many cars are built this way today that the "east-west" engine is regarded almost routinely overseas, though no car using it has yet been put in production here. British Leyland Motors makes three "east-west" lines with front engines and front-drive, the famous Minis. Autobianchi, a Fiat subsidiary, is another cross-engine, front-drive producer with its Primula model, and Fiat is also readying a similar design.

Other builders of transverse-engine front-drive cars include Peugeot with the 204, Honda with its tiny N360 sedan, soon to be landing on our shores in volume, and Chrysler's French subsidiary, Simca, with its 1100GLS sedan, closely following the Autobianchi/Fiat pattern.

Popularization of the "east-west" engine on our continent is the objective of the new Austin America (see page 44), a special design for our market by British Leyland Motors. Only the front 18 inches of the America's 12-foot length are needed to accommodate the 58-hp engine. Actually, the transverse engine once had a good start, and but for a twist of fate more than 70 years ago, might have been considered conventional today.

In the beginning (as you'll surely recall) the inventors of the automobile generally followed machine shop practice in laying out their drivelines. The axle was across the car, so the crankshaft was placed in the transverse plane, too, connected to the axle by selective combinations of belts, chains or gears. The cylinders stuck up vertically at the rear or laid flat under the carriage-like bodies.

This arrangement could well have been continued and developed into the transverse-engined automobile of today

— if it hadn't been for Frenchman Emile Levassor. He decided in the early 1890s that his tall Daimler-designed engines should be placed vertically at the front of the car, driving a gearbox and shaft down the middle. His Panhard et Levassor cars were very successful in the early races and the driveline Levassor invented became the standard scheme.

With the swing to fore-and-aft drivelines, the transverse rear engine was stigmatized as antiquated and fell into total disuse for several decades.

After World War II several cars with "east-west" rear engines went into production. One that only attained the prototype stage with this layout was the Tucker of 1947. The first car had the flat-6 engine placed transversely between the wheels, with each end of the crankshaft driving a wheel directly via a fluid coupling. This was the famous Tucker which actually did not have a reverse gear! Later Tuckers used a completely different longitudinal engine placement.

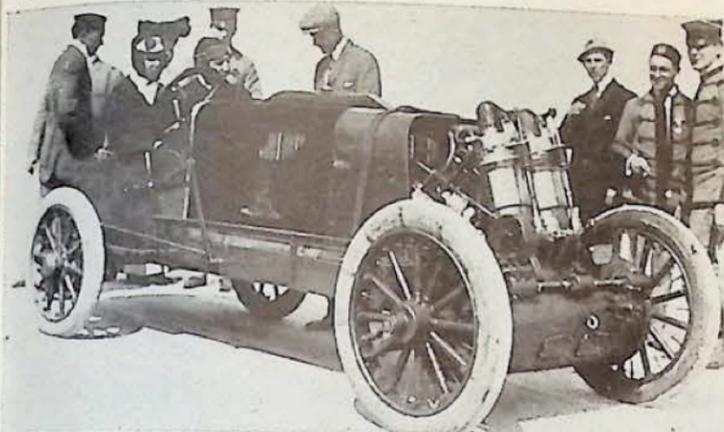
Germany's tiny twin-cylinder Goggomobil placed its engine laterally in the back, as did NSU with the Prinz twin it unveiled in 1957.

Generally the trends are away from rear-engine mounting for normal passenger cars, so most of the newest transverse-engine layouts have been for front-drive sedans. Sports and racing cars, however, present a different story. They're turning more and more to rear-mounted engines for the ultimate in traction and balance, and many designers are placing the engines transversely to save space and keep the engine mass within the wheelbase.

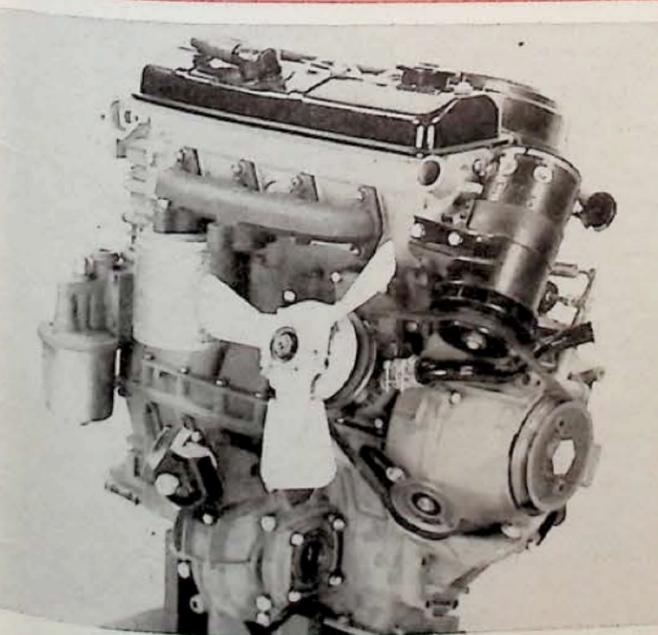
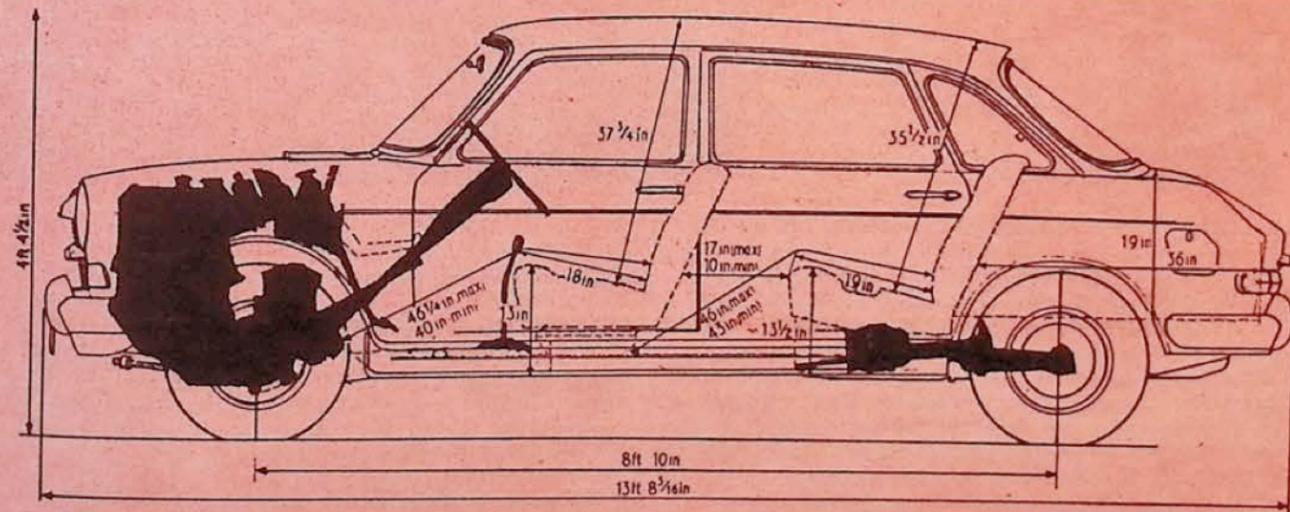
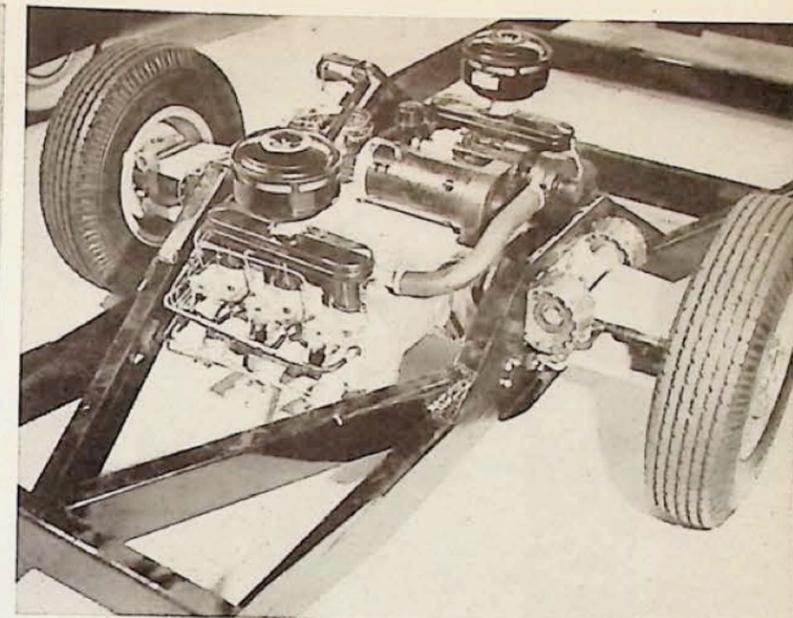
Racing car designers who have had the opportunity to engineer complete new engine-gearbox packages for transverse mounting have often chosen to take the drive from the engine at the center of the crankshaft, rather than at the end. This has the desirable effect of reducing, by half, the length of crankshaft that's subject to the twisting effect of the pistons and rods, proportionally reducing also the actual amount of crank twisting that takes place.

Overall width is not a problem with a rear-engined sports car, but the length of the engine in the chassis has a direct effect on the available interior room for people and luggage. When the aggressive Lamborghini firm unveiled its transverse-engined Miura chassis there was amazement at its boldness and ingenuity, attributes that pay off in the car's remarkable roominess and storage space within a small overall envelope. The striking Miura has set a lot of Detroiters to thinking seriously about the neat way a big V-8 would fit transversely in the back of a sports car.

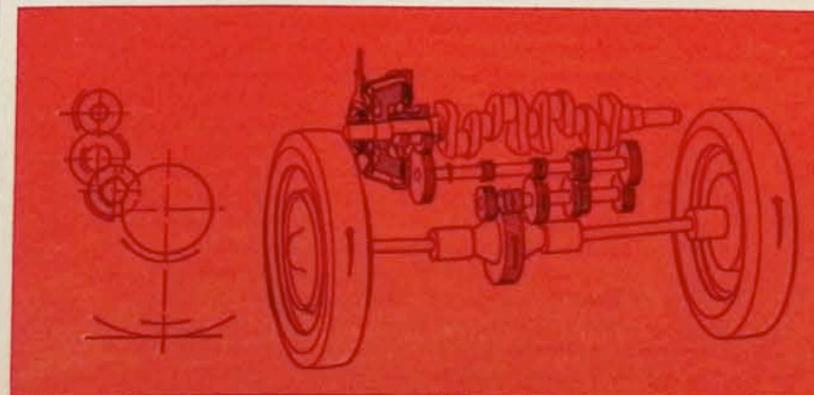
Working with Bertone, Lamborghini took the same idea a step further with the experimental Marzal 4-seater. By placing an in-line 6-cylinder engine (one bank of the Miura's V-12) at the extreme rear of the car, behind the rear axle, chief engineer Dallara opened up the whole chassis platform to passenger space. At a glance it's hard to find the location of the engine in the low, roomy Marzal. In every way, but especially in its engine layout, the



In the beginning, logic said both engine and axle should be on transverse plane. And even as early as 1908, a machine like the front-wheel-drive Christie (above) roared across Daytona Beach. But, logic went by the board soon after Panhard et Levassor cars, using today's driveline layout, were very successful in races of the day, and the sheep followed. (Right) And remember the original Tucker? That didn't get very far either.



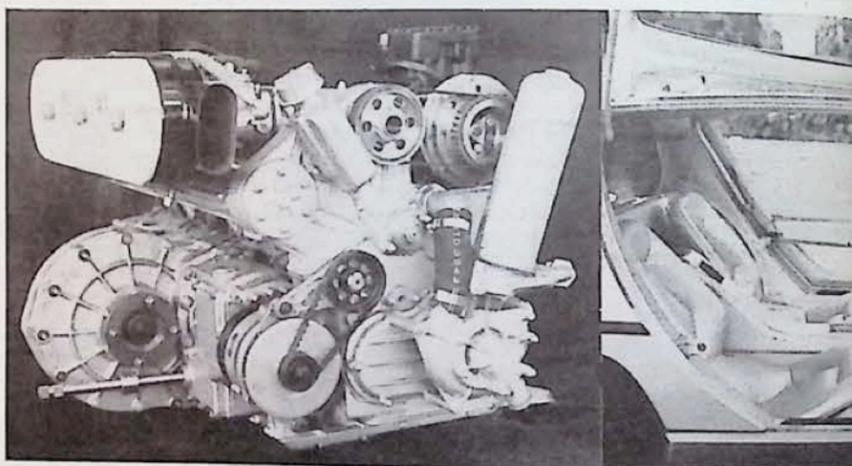
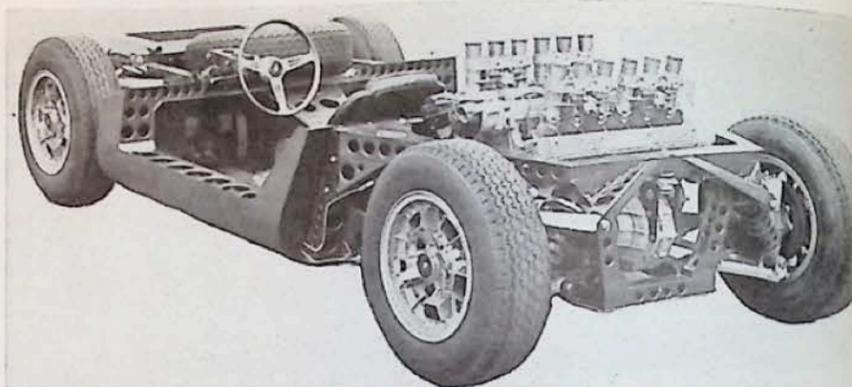
Austin 1800 (above) is classic study in benefits of transverse-engine/ front-wheel drive. Passenger dimensions exceed Electra 225 but car is full five feet shorter. Peugeot went east-west direction in design of their new 204. Engine (left) follows theme created by Alec Issigonis in famous Austin Mini. To conserve utmost space, transmission lies just below crankshaft and shares common oil supply as shown (right). For those believing contemporary U.S. designs are fine, good luck in crowded '70s.



THE TRANSVERSE ENGINE



Any reservations about how a transverse-engined car should look are erased by the beautiful Ferrari Dino 206 (above). With powerplant just forward of axle, substantial trunk volume is available in rear. Then, there is the fantastic Lamborghini Miura (above, right), one of the most talked about machines ever built. Chevy even bought one to see how it was put together and record driver compartment temperatures in places like the Mojave Desert. A rear-engined Corvette, perhaps? Next from Lamborghini came Marzal (right) that used 6-cylinder power.



Marzal expresses one clear design direction the sedan of tomorrow might follow.

Two other experimental cars, both 2-seaters, place their transverse 4-cylinder engines behind their occupants. One is the Autonova GT, a crisp sports coupe on the NSU sedan chassis. The other is the Scarabeo, a joint project by Alfa-Romeo and OSI, an Italian body manufacturer. It used a simple angled shaft with bevel gearing to get the drive from the end of the engine/gearbox unit to the central differential, the engine unit being just ahead of the axle line. Both these cars have sharply squared-off rear ends which were controversial when they were first shown; the Italian one may see production in a more rounded form.

Another important convert to the transverse rear engine is Ferrari, who chose the layout for the final production edition of his Dino 206 coupe. Placed just forward of the axle, the engine takes up the least possible amount of space and leaves a substantial trunk volume free at the extreme rear. Other rear-engined sports cars have been created by moving rearward the transverse engine packages of front-drive sedans, like the Unipower and CD-Peugeot.

Over the years the transverse engine has remained more closely identified with front-wheel drive for normal passenger cars. Placing the engine laterally, very close to the axle, helps concentrate its weight on the front wheels for the best possible traction. The only disadvantage is one of width: if an engine is too bulky when mounted across the car, it can interfere with front wheel movement, limiting the steering lock. But in practice this has seldom been a real limitation.

The most potent impetus to the transverse engine in England came in the form of an announcement by BMC in late 1959 that it would build a new range of front-drive small cars, the now-famous "Minis." Back in 1951, Alec Issigonis of BMC had made an experimental installation of a transverse front engine in one of the company's stock models, and he revived the scheme to squeeze the absolute

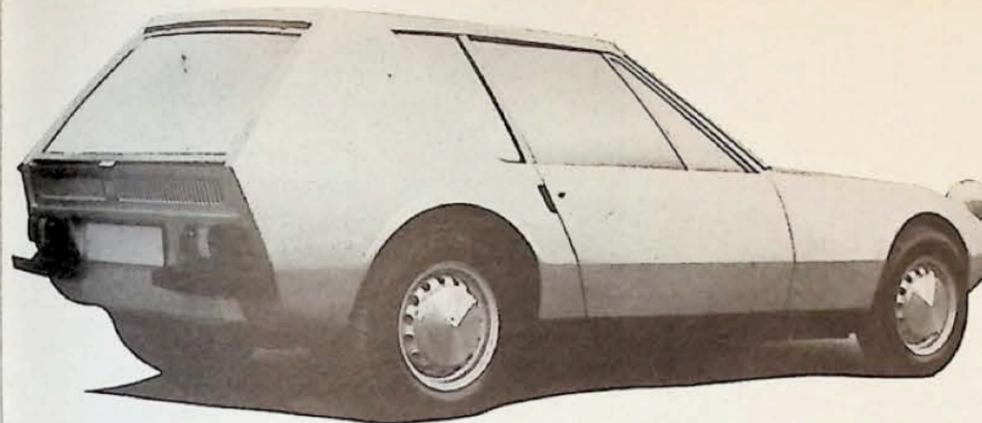
maximum interior volume out of his shoebox-shaped Mini-Minor. Increasing traffic congestion in Europe's major cities was applying pressure to the exterior dimensions of the automobile, and BMC was the first to respond to this entirely new need.

The Minis caught on well with the British public and BMC moved fast to slot in the next level, the prettier and roomier 1100 sedans, still with the same basic power egg up front. This is the one the Austin America is based on. Finally in 1964 Issigonis produced his biggest cross-engined car, the voluminous 1800 with its own special drive layout. Like most larger front-drive cars, it proved to be at its best in the deluxe versions with power-assisted steering. Nevertheless, it has as much room as a U.S. intermediate within an overall length of a VW.

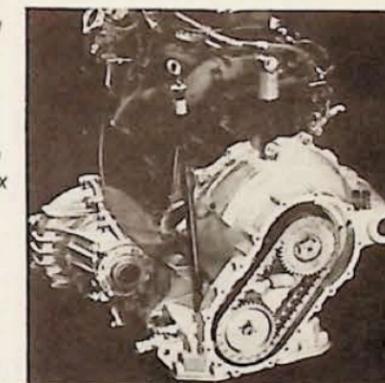
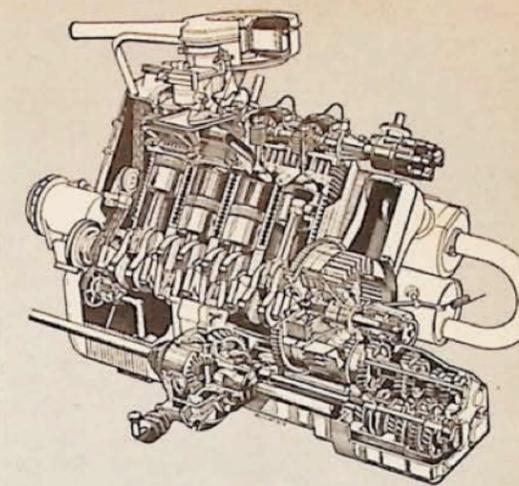
During the Sixties, transverse-engined cars appeared in other countries, cars which could not deny their own solutions to the fresh problem of gearing the transverse engine to the transmission and differential.

Designers were initially hesitant about transverse engines because they knew it would not be easy to fit them with automatic transmissions. Each automatic has to be designed for the particular shaft layout of each car — so far. As "east-west" engines become more popular these layouts will be more standardized than they've been during these early experimental years. They're still not agreed on what to do with the oil, for example. The smaller BMC cars and the Honda use the same oil for both engine and transmission, while the bigger BMC models with automatic transmission, and most others, separate the two oil supplies to prevent contamination from the engine from affecting the consistency of transmission operation.

A special boon to the lateral engine fanciers has been the development of improved power transmission chain. The "Hy-Vo" chain from Borg-Warner's Morse Division uses link pins to achieve smooth, silent high-speed operation. It's used on the big BMC 1800 to get power from the engine centerline to the gearbox in the automatic



Autonova. Sounds like a new Brazilian dance, doesn't it? But no, it's NSU's transverse-engine exercise (above). Overhead cam four unit places transmission at end of crankshaft and differential under crankshaft. Notice that immediately behind clutch is squirrel-cage blower to move air around cylinders. Also, distributor drives directly off end of camshaft. Hy-Vo chain developed by Borg-Warner's Morse Chain Division (right), transfers torque from converter to gearbox as shown installed on front-wheel-drive Wolseley 18/85. B-W Model 35 automatic transmission is located beneath the engine like Austin America. Interior of Marzal (left) is so large in comparison to rest of car that it appears there is no room for engine. But there is, and the whole concept points the way toward what we can expect.



version. This distance is sufficiently large in most engine/gearbox combinations that either an idler gear or a chain is needed to keep the transmission from getting ground up by the crankshaft.

Special solutions are also needed for the unique torque reactions and vibration characteristics of the transverse engine. No longer, of course, can engine torque reaction rock the car about its fore-and-aft axis. But this reaction has to be taken through the whole engine/gearbox package, in most cases, meaning that the mounts have to resist torsional movement firmly about the transverse axis, while remaining soft and flexible in other planes to soak up engine vibration before it's fed into the body and passenger compartment. Some engineers also note that the flat sides of the engine radiate the most noise, and in a cross-engined car at least one of these sides is aimed right at the occupants. This has not been an objection in practice, however.

Transverse engine mounting in U.S. cars would be most likely to occur at the front, to provide the kind of weight distribution most American drivers are used to. It would most often be used with front-wheel drive, but it could also be employed with rear-wheel drive through an offset driveline like that featured on Ford's experimental Techna (MT, Sept, '68). As mentioned earlier, the only exception to this would be a possible cross-engined sports car from Detroit. GM is interested in the idea for the Corvette; several suitable powertrains could be taken off the shelf where they were placed after the pre-Toronado research work GM did on transverse engines. And Ford has experimented with a Mustang with an in-line six placed laterally at the rear.

Saving of space in the fore-and-aft direction would be the main reason why Detroit would move from "north-south" to "east-west." The added space could radically transform the passenger compartment. As a concrete example of this we have saved for last some very neat experimental cars built by Checker Motors just after the

War. Checker built and operated a prototype of its Model D taxicab, which had a 6-cylinder Continental engine placed transversely ahead of the front wheels.

Chief engineer Herb Snow's design for the Model D was simple and practical, as befitted a cab, with a special gearbox and an angled lateral driveshaft to the offset center section of a solid front axle. In profile the layout is a dead ringer for the BMC configuration of more than a decade later. The Model D Checker had a 112-inch wheelbase and was only 190 inches long overall, putting it in the category we call "compact" today. Yet it had a full taxi interior, complete with limousine-type jump seats in the rear. A planned passenger-car version had as much rear-seat leg room as a Cadillac Fleetwood Brougham.

Given the added front-to-rear space, however, Detroit might not choose to allot it to the occupants or to a shorter overall length. The big challenge our designers face today is the location of body volume that can be used solely for absorbing the energy of a 50 mph barrier collision. The transverse engine, laid out specially for the job, would be one of the few design devices that could add some crush volume to the car right now. So that the space isn't entirely wasted, we might even find cars with new cooling systems, perhaps in the wheel houses like the BMC models, that would allow an additional luggage compartment at the front of the body.

Pininfarina of Italy spurred the thoughts of auto designers in this direction with a very handsome prototype sedan shown for the first time at Turin last year. Built on the frame and drivetrain of the BMC 1800, it showed how an extended nose which also housed the spare tire could add crash absorption distance and aerodynamic penetration at the same time. With a very roomy interior and an abbreviated tail, the Pininfarina sedan had a confident look of the future about it — a future that certainly includes more and more automobiles with "east-west" engines, the newest technique in the toolkit of the man who'll be designing your next car.

It very nearly reached the point in 1968 that a Chrysler product could not win a major NASCAR Grand National stock car race. Until the Old Dominion 500 came off the latter part of September in Martinsville, Virginia, a Chrysler product had seen the checkered flag just once — at the World 600-miler in Charlotte, North Carolina, in May, when Buddy Baker drove into Victory Lane, \$26,000 richer for his trouble. Now fully addicted to victories by Ford products, the 20,000 fans who gathered at the half-mile, slightly-banked track anticipated another Dearborn sweep.

Since 1960, the Randleman Rocket, Richard Petty, has won Martinsville Speedway five times, the same number of races won by former Ford star Fred Lorenzen, who is no longer very far removed from his broker's office in Chicago. Just why 31-year-old Richard has excelled here is one of the fickle aspects of the sport, probably the same reason that Cale Yarborough, the new Ford-Mercury whiz, has won both Daytona Speedway classics, the Atlanta 500 and the Southern 500 at Darlington, S.C., this season. And we should add that one of the races Petty did not win at Martinsville was the spring 250-miler this year. Yarborough got that, too. He's the only driver ever to win three 500- and one 400-miler in the same year.

Petty's sixth victory at Martinsville, of which he is now undisputed king, was a joy ride, a cakewalk, as simple as having the best handling machine on the track.

He twice chased down the Ford Torino of David Pearson, Petty's most fierce competitor in the short distance events this season, and led 239 laps of the race. Unlike previous outings, fortune rode with Petty through a first-lap, first-turn skirmish between front-row starters Yarborough and Baker that might have wiped out many of the competitive machines had those involved not recovered quickly. Baker spent the afternoon nursing this damaged Dodge Charger and ultimately was kayoed when it caught fire in the pits, typical of Chrysler fate all season. Yarborough recovered to trail Petty under the checkered flag in his 1968 Mercury expertly prepared by the Wood Brothers, though Cale was three laps behind. And Lee Roy Yarbrough, in Junior Johnson and Herb Nab's Torino, was third in the same lap. All conceded defeat, for if Yarborough and Yarbrough and Pearson can't outrun Petty, nobody can.

But Petty didn't count a cent of his \$6000 first-place money until he reached the press box. It was his first major victory of the year and his first of more than 150 miles in length, though it was his 14th triumph overall, one less

than Pearson's NASCAR-leading fifteen wins. It's understandable, then, that Petty could not be optimistic while out there in battle. In 1967 he won three superspeedway races, including the Southern 500, some 250-milers, a record 27 races, 10 straight and more than \$130,000.

Yarborough's second place at Martinsville was worth \$2700 and increased his seasonal earnings to an all-time high of \$130,706, \$431 more than Petty won in all of 1967. Yarborough had broken the money-winning record with those five major wins and what he picked up in 17 starts, less than half the number of Petty appearances in 1967. In fact, through Martinsville this season, Petty had started 44 races — and won \$56,000.

So, winning its first complete major race, Chrysler had to share the spotlight with Ford and Yarborough at Martinsville. Which meant sharing the prestige and the publicity as well. Even winning, they lose.

Why has Ford so completely dominated the world's richest stock car circuit? Why has it won 26 of 44 starts, eight of nine runs of 400 miles and longer, a 300-miler, all save one of the 250-milers up to this sitting, and is threatening to win the tightest Grand National points race in years with Pearson? What are Chrysler's plans for 1969? What are Ford's? While

Chrysler is enjoying a chip of deserved and hard-fought glory, let's look for some of the answers.

High-speed stock car racing is expensive, and the factory group which spends the most money normally is the one which prevails, though not always. The fickleness of the sport, the significance of the human and mechanical elements are certainly key factors. It is a closely-guarded secret how much Ford budgets for NASCAR Grand National stock car racing but it is plenty since Indy and Le Mans no longer drain away revenues. Chrysler also keeps its figures within the family, yet it is no secret that Ford is spending more in 1968 than Chrysler.

Ford has fielded a near invincible lineup in the major events, equipping its army with the finest, and fortunately, experiencing a minimum of the mechanical failures and adversities anticipated anytime a team goes onto a race track. The machines of Yarborough, Yarbrough, Pearson, Donnie Allison and the newest member of the team, Paul (Bud) Moore of Charlotte are capable of winning any race in which they compete. And all of them make most of the longer events.

Since Yarborough started so fast on the big tracks, Ford decided early in the season not to participate in 100- and 150-milers, but with Chrysler's

Petty and Bobby Isaac and Baker going for the championship, John Holman was able to convince his superiors of the need to campaign short-track ace Pearson in nearly all of the outings. It turned out to be a wise decision.

Ford's machinery has been amazingly durable, especially its 427 tunnel-port wedge engine, which has been almost totally free of major failures, certainly nothing comparable to the two previous years. Ford finally gained the respect of Chrysler rivals. Isaac has been chasing Pearson in a bumper-to-bumper duel for the points championship in Dodges sponsored by K and K Insurance of Ft. Wayne, Indiana, but cannot close in.

"I just haven't been able to compete with Pearson. For one reason, I've been driving a year-old car. For another, I can't get the precision parts; and for a third, I've never seen cars hold up as well and finish as many races as Pearson's. I can run with Pearson and Petty for a while on any track, but I can't beat them often," said Isaac, who only won three of his first 44 starts, but finished among the top ten 31 times.

Baker, Dodge's No. 1 team in cars prepared by master mechanic Ray Fox, won only the rain-shortened World 600 in the first 38 starts. All sorts of troubles have dented this team's effort to win the points title.

Explains Fox, "There's no question that Ford is spending more money than Chrysler, and this is the key reason it's dominating the circuit. It's tough to go to the race track and battle five Ford products, any one of which can win. Ford improved its engines and parts, and this has helped tremendously.

"On the other hand, we have had more than our share of engine problems this season, and some unbelievable failures. For instance, in the Southern 500 at Darlington, Buddy drove 450 miles with no brakes. A piece of debris flew up and knocked the brake adjuster off one wheel. We've also been knocked out of two superspeedway races with broken or stripped lug bolts. Although I've won nine superspeedway races since 1960 (two with young Baker as driver), this is my first year on the short tracks, and I'm learning the ropes. There's a lot of difference running 100-milers on half-mile tracks than big ones," Fox said.

Whether Chrysler will spend more money in 1969 remains to be seen, but Rodger indicates it will. Just who will be driving Chrysler products next year also is uncertain since contracts are made in December.

Rodger says the company is hopeful of improving its hemi-engine, particularly the carburetion system and other engine parts. They had a lot of trouble with connecting rods this year.

Chrysler did not perfect the dual carburetion it was given permission to use through a rules change during the season largely because of lack of time, high costs, and the suspicion the rules would be different again in 1969. And they were right, all engines in NASCAR Grand Nationals will use only one carburetor in 1969, and Chrysler's is expected to be much more competitive.

Chrysler plans to stick with the Road Runner next year. There are very few visible changes in the design of this model Plymouth, but Dodge has a new Charger 500 in which the hemi-engine is available as an option. The 500 is a fastback with a flush grille as opposed to the 1968 notchback with the scooped grille. "We have conducted wind tunnel tests on both 1969 Dodge Chargers," Rodger said, "but we'll have to test on the tracks before determining which car we will race."

Next year Ford again is expected to field a mixture of Torinos, or Cobras and Mercury Cyclones. The company has their new 429 cubic inch engine that was introduced in T-bird last year and has been tested, but not conclusively. There are hints of a reorganization in Ford's racing setup, and how this will affect '69 is hard to determine. In any case, Semon E. Knudsen will be watching closely. Knudsen never backs a losing hand.

/MT

OLD DOMINION 500



Even when Chrysler wins, they seem to lose. by Bob Myers

Old Dominion 500 Results			
POS.	DRIVER	TYPE CAR	LAPS
1	Richard Petty	68 Plym	500
2	Cale Yarborough	68 Merc	497
3	Lee Roy Yarbrough	68 Ford	497
4	Bud Moore	68 Ford	494
5	Bobby Isaac	67 Dodge	494
6	David Pearson	68 Ford	492
7	Ray Hendrick	68 Plym	492
8	Donnie Allison	68 Ford	491
9	John Sears	66 Ford	488
10	Roy Tranthan	68 Ford	485
11	Friday Hassler	66 Chev	475
12	Roy Tyner	67 Pont	474
13	Wayne Smith	68 Chev	470
14	Bobby Allison	66 Chev	468
15	Wendell Scott	66 Ford	465

1. As eventual winner Richard Petty slides through the turn, John Holman, director of the vast Holman-Moody enterprise, monitors the progress of the race. 2. All-time NASCAR money winner, Cale Yarborough, finished three laps behind Petty, needed a breath of oxygen to get things in perspective after the battle. 3. And battle it was especially the first lap when Cale and Buddy Baker got into it and Wood Bros. had to provide a lot of instant service. 4. After the race Richard sipped something cool and hoped his luck had finally changed back to fantastic 1967.

Photos by Don Hunter

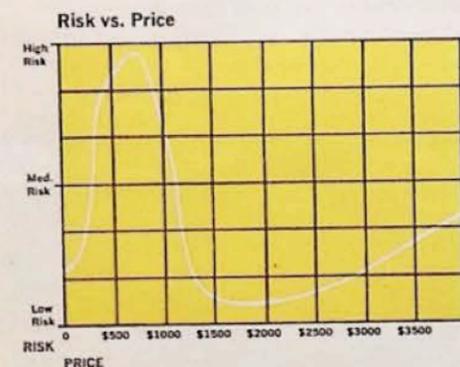
Is a \$100 car a good deal? Probably not, but from the standpoint of financial risk, it might easily be a better deal than a \$700 used car. Why? Well, look at the economics.

You buy a \$100 car that's in acceptable condition—no looker but runs okay. You'll probably have to sink another \$150-250 into it fairly soon for normal repairs—new brake linings, probably some front-end work, shocks, that sort of thing. Then when you're done, you've got something like \$300 in a car that's still worth \$150 when you're ready to sell it two years later. The total driving cost to you: \$150.

Now suppose you'd bought a \$700 used car instead. This one will also need work, probably the same work, but let's say those repairs cost only \$100. Figuring in depreciation, this car would return you about \$350 after two years, so your driving cost this time runs to \$450.

Comparing the two, the \$100 car saved you \$300.

I'm speaking on the simplest level and in very general terms, of course. An awful lot depends on the condition of either specific car. But to broaden the example and even to formulate a basic theory of used-car economics, I think we can view the price/financial-risk picture of used cars in terms of this chart.



What I've done here is to plot price against risk. My contention is that the safest used-car buys lie in the range from about \$1400 to \$2600. The poorest risks—those cars you're bound to lose the most money on and the ones that will give you the worst headaches through a general need for major repairs—are examples ranging from \$400 through \$900.

To elucidate: extremely inexpensive used cars don't really involve much financial risk. Cheapo cars have the great advantage that, if something big goes wrong (it throws a rod or the transmission falls out), you simply junk it. The loss won't be large.

But those same major problems are just as likely to happen to a \$700-\$900 car because both the \$100 cheapo and the 1962-63 middle-aged variety are getting pretty near the ends of

Used Cars



by Michael Lamm

their useful mileages. Any car can be expected to give good service up to about 85,000 miles (with average care). Beyond that they start becoming chancy. And the likelihood of a \$100, 1958 model being much less reliable than an \$800, 1963 model tends to be negligible—both have wracked up more than those unmagical 85,000 miles.

While you can junk a \$100 car with good conscience, you can't do that with one costing \$800. The more expensive one demands fixing: it's worth nothing with its ills and you have too much invested to turn your back on it. So in addition to the mild beating you'll take on depreciation, the chances of taking another beating on repairs makes the \$700-\$900 car much riskier than the cheapo. (I must stress that I'm speaking only of financial risk, not risk in the sense of safety—that's another matter altogether.)

In the price range \$900-\$1500, the chance of something major going wrong becomes less as price increases. Thus I've designated the \$1400-\$2600 range the least risky, because you can normally find used cars at those prices that have plenty of reliable miles left. While in some cases you might again have to invest in the more routine shocks, brakes, tires, etc., the chances of an engine, gearbox, or something really big going sour is fairly small.

Why, then, do I start the risk curve sweeping back up after \$2700? Because the financial risk here is reflected in depreciation, not in repairs or unreliability. Used cars costing \$2700 and up hold no great advantage from a cost/depreciation standpoint over new cars in the same price categories. In other words, if you've got that kind of money to throw around, throw it at a new car and eliminate all the risk of buying used.

You're thinking (rightly so) that this chart and the whole theory rests on very general bases. True enough. I must stress that it's very possible to find low-mileage, good used cars costing \$400-\$900. It's also possible and even very easy to find \$100 cars that are practically guaranteed to fall apart as you drive off the lot. And some

\$2000 cars do the same—those with extremely high mileages especially, and there are loads around nowadays.

The question is: how do you determine a used car's condition—any used car's, regardless of age and price?

Bumper Jumping

Before I begin answering that question in detail, let me stress as I have many times before that the single most important step in any used-car purchase is to have all likely candidates checked out professionally, either by a diagnostic center or, if that's not handy, by an objective mechanic. Such checks should be made before purchase, not afterward.

A diagnostic-center report will automatically list all defects. If you take the car to a private mechanic, though, you'll have to specify the tests you want made. These should include at least the following: compression check, inspection of brake linings, exhaust system, tires, cooling system (inside and out), frame, and front-end alignment. Then have the mechanic drive the car to listen for noises, appraise the transmission and drivetrain and give general impressions.

Such checks range in price from about \$6 to \$12.50 and, as I've said before, you can't buy cheaper used-car insurance.

Now, before you get to the serious stage of having a car inspected commercially, there are a number of checks you can make on your own. These tend to eliminate a number of potential purchases and help boil your choice down to that handful worth taking to the diagnostic center.

On-the-lot tests. Every dealer makes his cars look good. It's called detailing. In the process he tries to mask everything wrong with it—not necessarily intentionally, but he does. Do look beneath the sheen: has the car been repainted, either completely or spot-shot? You can tell by traces of overspray and poor masking on chrome. If so, and if it's a late model, why did the dealer repaint? Was the car rusted? Or bashed? Abused? Or simply ungaraged? A newish car shouldn't need refinishing, and even an older one, well cared for, shouldn't. If it has been repainted, look for: rust spots by pressing your thumb all along rocker panels and body sills; sighting down body sides for ripples, frame damage and poorly matched panels and holes or putty shavings in the trunk. All these are better gauges of a car's true condition than fresh, clean paint.

On the inside. Check for wear on pedals, floor mats, steering wheel, armrests, and other rub points. Does their condition gibe with odometer mileage? Even the dimmer switch can give clues to mileage—compare the appearance



Photos by George Foon

of a new one with used ones.

Down on your knees. Not many dealers leave original tires on a car these days. So you won't get any hints about front-end alignment or shock condition from these. If tire tread looks new, it doesn't mean the tires are. You can recognize recaps by a smooth, new-looking rubber tread and slightly cracked rubber on the sidewall (or scuffs or a hairline ridge between tread and side). Recaps aren't necessarily bad in themselves; sometimes new, bottom-of-the-line tires are worse.

As for shock absorbers, the classic test is to hop up and down on the bumper a couple of times, then jump off and see how long it takes the body to settle down. If it's more than one more oscillation, the shocks are weak.

On the sly. Dealers nearly always steam-clean the engine and sometimes the undersides of used cars. Often they'll repaint the block and even paste new decals on rocker covers, radiator and air cleaner. Don't be fooled. An antiseptic engine compartment doesn't tell a thing about how the car runs.

Let the engine idle until it's warm, then goose it a few times. If blue smoke comes out the exhaust, it means oil burning. If black, it's simply a maladjusted carb, nothing serious. If no smoke at all, fine—that's how it ought to be. And then listen for noises. Tick-ticking probably means a stuck valve lifter. Squeaks and whines may come from bad bearings in the generator, water pump, power steering or like that. Knocks of any kind are best detected by running the engine

slowly up through its rpm range. The hood should be up and all windows open when listening to the engine.

Everything work? Be sure to try all switches and controls: lights, wipers, door handles, window cranks, vents, emergency brake, radio, turn signals, air conditioner (cool air should emerge within 60 seconds); power seats, vacuum trunk latch, etc.

On the brakes. Try the brakes even as the car stands still. Push the pedal down hard (engine on with power brakes), and hold it tight for a minute or two. Does it tend to sink? Can you smell brake fluid? Now pump the pedal to see if it rises.

On the road. While driving the car, again listen for untoward sounds. Be sure the transmission shifts smoothly and doesn't slip or snap. If the car rattles, what causes it? As you're driving along, punch the accelerator a few times in quick succession to see if there's play in the driveline—windup in the universal joints or slop in the differential. The car also shouldn't veer or wander, with minimal or no play in the steering wheel. Brakes should hold equally on all four wheels.

On your own. Finally, ask to test drive the car alone, without the salesman along. In this case, take it to a parking lot or other out-of-the-way place where you can look under the place where you can look under the seats, inspect the spare well by removing the tire, and check under the trunk mat. Small clues here can tell you quite a lot; i.e., body-putty shavings under the trunk mat mean repairs have been done to sheetmetal, etc. I once bought a car that had wisps of straw

chicken feathers, two pennies, and molten lollipops under the rear seat. I interpreted these clues as the car having been owned by a farmer with children. (It turned out to be a good car even though the dealer told me it had been owned by a retired engineer.)

On the bottom. If possible, take the car to a filling station and have it put on a lift. Oil leaks, missing bolts, worn rubber grommets at body mounting points and sway bar connections all tell something about condition. Gasoline leaks usually leave stains even if they aren't wet. Rust in fender crevices, tailpipes, inside bumpers, etc., can also be taken as gauges of use. Spoke-like streaks on the insides of tires or wheels probably mean bad axle seals or bad brake cylinders. Pinch all rubber brake hoses to check for cracks or sponginess. And, of course, check the underpinnings for signs of a previous accident, both wrinkled hidden sheetmetal and bent frame members.

Apply these simple checks to any used car you're interested in—expensive or cheap, those offered privately as well as the ones on lots. The secret is not to be in a hurry. Don't let the salesman or owner rush you.

If everything seems to pass preliminary muster, then take the car in for a professional check. But never, never rely completely on your own judgment when appraising a car's condition. Make an appointment at a diagnostic center or garage, get permission to take the car off the lot for a few hours around that time, and then find out all those things you can't possibly catch in your own evaluation. /MT

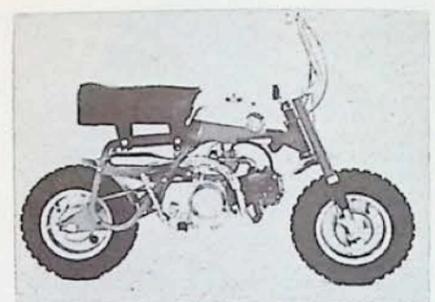


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PRODUCT TRENDS



New Honda Mini

American Honda Motor Co. Inc., Gardena, Calif., has announced the introduction of the new Honda Mini Trail, a beautifully designed, well-engineered lightweight suitable for today's expanding recreational/off-road market. Combining dependable 4-stroke engine design with a power-saving overhead camshaft for maximum power output, the Mini Trail is safe and easy to ride with automatic clutch, rugged internal expanding front and rear brakes and adjustable soft seat.

The new addition to the ever-expanding Honda line is so compact and lightweight that it can be taken anywhere. Weighing just 108 pounds, with such features as fold-down handlebars, a leak-proof gas tank and fold-up pegs, the Honda Mini Trail can be in the family car or even a small plane or boat.

SPECIFICATIONS — HONDA MINI TRAIL

Weight	.....108 pounds
Engine	.....4-stroke ohc single
Overall Length	.....50 inches
Wheelbase	.....34 1/2 inches
Width	.....25 in. w/pegs; 16 in. folded
Height	.....39 1/2 in. up; 26 1/2 in. folded
Fuel Consumption	.....100 mpg
Tires, front and rear	.....3.50x8
Color Options	...red/white; yellow/white

Sleep Easy

Sterling Products Company has launched a campaign against "sore heads" — specifically, heads belonging to automobile passengers who, while dozing, have banged



themselves against the side window. The key to the campaign is Sterling's new Comfy Rest, a headrest which mounts on the side window, for comfortable traveling. Contoured to fit big heads, small heads, thin heads—even fat heads—the Comfy

continued



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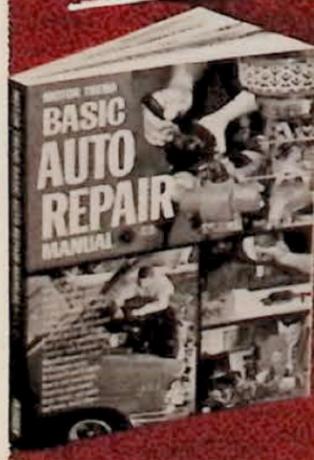
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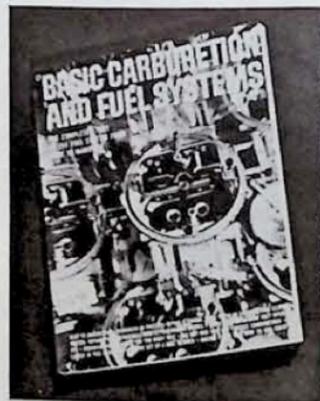
PRODUCT TRENDS *continued*

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The two systems on a car that seem to give the enthusiast the biggest headache are the carburetion and fuel. Now, the Hot Rod Technical Library, in its continuing expansion of topics, for the first time explores in depth the full range of the subject. Presented in language everyone can understand, *Basic Carburetion and Fuel Systems* bypasses confusing mumbo-jumbo and high-flown theory and gets down to the nitty-gritty information and advice that you can use with the book in one hand and a screwdriver in the other.

This 192-page manual tells — and shows — how to examine, test and adjust the carburetor itself — Carter, Rochester, Holley, Stromberg, Ford, even Weber — as well as



related fuel system components. There is a detailed section on carburetor tuning that alone can save you many times more than the book's \$2 price tag.

One subject that concerns every car owner is emission reduction systems (smog controls) and here the BCFS offers a clear explanation of where they're located, how they work, how they affect your car's performance... and the legal hazards involved if you decide to disconnect or remove the system on your automobile. *Basic Carburetion and Fuel Systems* is available at newsstands or write direct to Petersen Publishing Co., 5916 Hollywood Blvd., Los Angeles, Calif. 90028.

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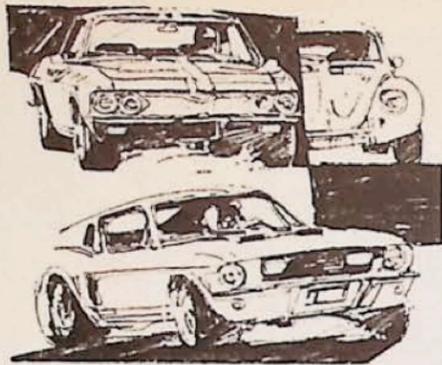
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effectively with conventional rear winter tires. It is interesting to note that Scott Harvey's winning Shell 4000 Rallye Barracuda was shod with Goodyear Polyglas bias/belted tires and that some sections of the course involved extended 120 mph speeds. Obviously, Goodyear has passed on some of the valuable experience gained in rugged rallye competition over to the regular product line.

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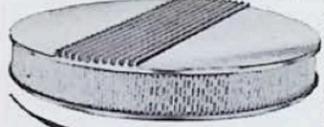
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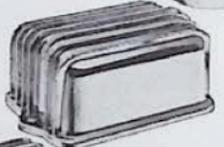
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Racer's Jacket

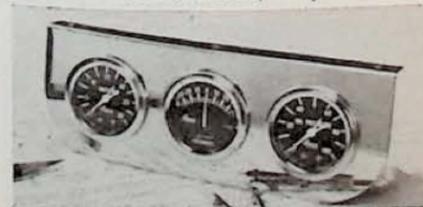
Fiery red Champion jackets, worn by the nation's leading drivers and pit crews, are now available to racing enthusiasts at a specially reduced price. The lightweight, nylon jackets, accented by a white Sebring racing stripe, are being offered by Champion Spark Plug Company, (Jacket), P.O. Box 7025, Toledo, Ohio.



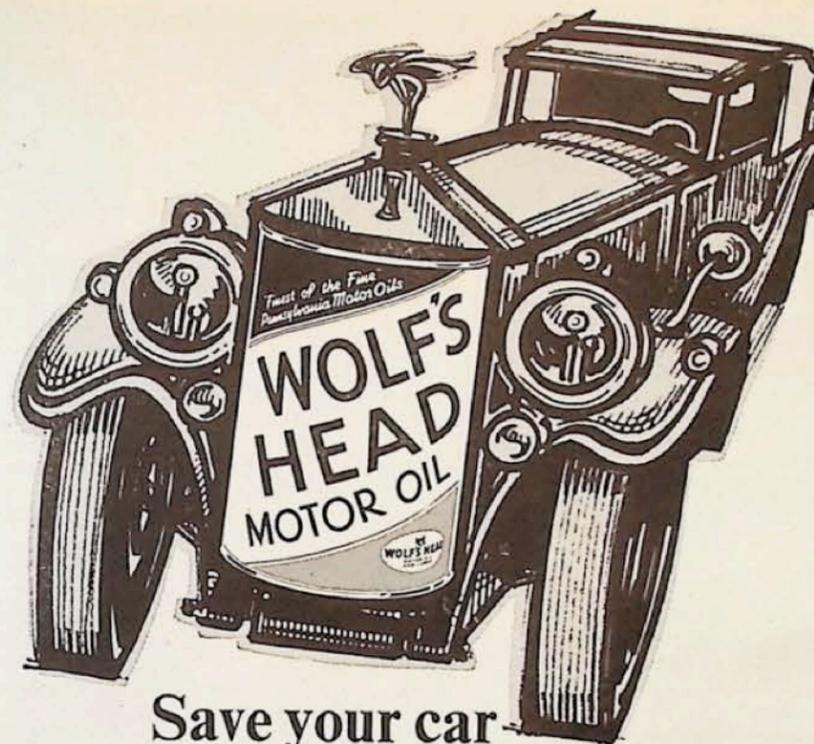
Designed for use at race tracks, other sports activities or for casual wear, the jackets come in sizes for men, women, teenagers and subteens. Jackets are lightweight, water repellent and machine washable. They also are guaranteed for one year against damage due to normal wear. In addition to design features like cadet-style tab collars and zipper fly front, the jackets are practical for racing, rallying or watching. Adjustable cuffs and waistbands keep out wind and dust. Large patch pockets and sleeve pocket can hold sun glasses, notebooks and pencils. Plenty cheap at the going rate of \$5.95 (\$7.50 in Canada), \$5 under the regular amount. Sizes: extra small (32-34); small (36-38); medium (40-42); large (44-46) or extra large (48-50).

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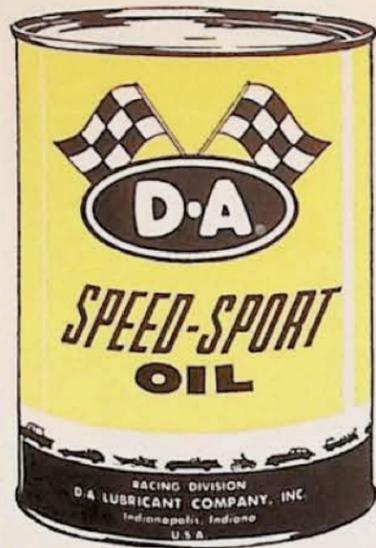
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Q&A

by John Ethridge

brinkmanship

Q The recommended ignition advance for my 360-hp 1967 GTO is six degrees (700 rpm, vacuum line disconnected). I have been using eight degrees with no sign of detonation. Could I advance it to the point where I hear some detonation and then back off some, or is this too risky? Another question: my red-line is at 5100 rpm, but the engine seems to be still pulling strongly. Is there much danger in taking it 500-1000 rpm higher? Stanley Vejtasa Champaign, Ill.

A Advancing the so-called static or idle ignition setting is not in itself likely to harm anything. But the trouble is that you also increase the total advance which could bring on high-speed detonation under heavy loads. This can lurch an engine in short order and is virtually non-detectable because of the general increase in noise level. Qualified tuners usually doctor the distributor to limit total advance when they advance initial setting.

The red-line is not very critical on your engine. Several hundred more rpm, even to the point of valve float, won't hurt the engine.

manual to auto

Q I have a 1960 Mercedes 190B sedan which has a very strong 4-cylinder engine with 4-speed manual shift. I would like to know which automatic transmission (preferably American) would fit in place of the present one. The 2-speed Chevrolet Powerglide is my first choice as it is easily available through wreckers here in Toronto. R. D. Bartoletti Don Mills, Ont. Can.

A None will bolt right on, so you will have to make some kind of adapter and change the length of the drive-shaft. You should also replace the fly-wheel with one from a Model 200 automatic. Expect a big drop in performance if you make the switch to the Powerglide. It would undoubtedly be easier—and performance would hardly suffer—if you used the Mercedes 4-speed automatic for the 200 instead. Although the latter costs an arm and a leg, it may very well prove to be cheaper overall than paying for adapter, machining, etc. needed to use the American automatic.

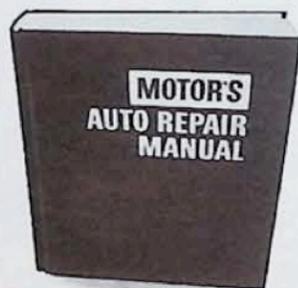
the numbers game

Q I've heard all kinds of reports concerning the octane of different brands of gasoline. I've been wondering what really are the octane ratings of the various brands of premium fuels? I've been using Sunoco 260 in my '63 Pontiac with the 370-hp, 421-inch engine. Is this the highest octane I can get? How can I find out for myself? Paul Yarman Bellville, Ohio

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A Octane numbers vary, even in the same brand of gasoline, according to the season and location where fuels are sold. Most premium grades sold near sea level are approximately 100. We suggest you write the companies that market the various brands you wish to consider, giving the point of purchase and the time of year. Expect answers like "98 to 101," because variations are bound to occur with the quantities involved.

Another interesting project, and about as close as you'll come to first-hand knowledge, might be to contact the Society of Automotive Engineers chapter at a local college or university. Checking octane numbers is a fairly common lab exercise for student members. They may already have the information you want or would consider a test program.

where thou wouldst dwell . . .

Q I've had a question concerning my '65 Corvair which has never been satisfactorily answered. When setting points, which is correct: setting the points by feeler gauge, or by dwell? I've set them by feeler gauge at .019-inch, then set them with a dwell-angle meter at 34 degrees—both by factory specs. Out of curiosity, I rechecked the setting and was amazed to find it .006-inch. My car runs exceptionally well for a 110 automatic, and as far as performance goes, it seems to run equally well when the points are set either way. What is happening? Robert B. Woodworth Newark, Del.

A You are reaping the benefits of a number of things which can be summed up as the design philosophy of the car you drive. You have a "relaxed 6" that makes no attempt to get the last dregs of power out of the displacement you have. The dwell specs allow your coil enough saturation to produce the fattest possible spark, where, on the other hand, the feeler gauge setting is tailored to long, attention-free service. Points tend to close up as the wear block wears, and, consequently, you get a longer period between adjustments than you would if the setting was absolutely on point. This perfidious philosophy pervades almost every aspect of the average American car. This has earned them names like "stove bolt" and "gas hog" everywhere. But their reputations as cars that thrive on neglect has made it necessary for nearly every country in the world to erect almost prohibitive tariffs against them to protect local products. For example, your little jewel, in England, new, would set you back something like \$5000.

death and taxable hp

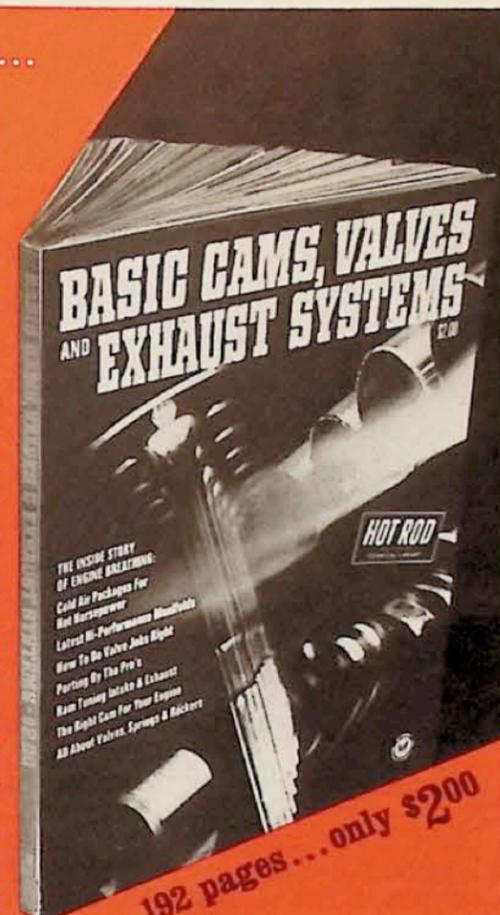
Q I understand that the taxable hp of a car is calculated by an sae formula. In Illinois license fees are figured by the taxable hp. Under 25 hp is \$8, 25-35 hp is \$12, 35-50 hp is \$18, and over 50 hp is \$24. My 1965 Olds 442 was rated at 51.2 hp. I recently purchased a '68 442 on which the taxable hp is stated to be 47.9, saving me \$6 annually. Did somebody goof, or what? How is taxable hp calculated? Joseph J. Sebek Brookfield, Ill.

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A Taxable horsepower is calculated by the following formula: $(B^3 \times N) / 2.5$ where B is the cylinder bore in inches and N is the number of cylinders. Olds shuffled dimensions on its '68 engine without significantly changing the displacement to aid in meeting the new emission laws. Small-bore, long-stroke engines generally have cleaner exhausts for a given displacement. Your '65 has a bore and stroke of 4.00 x 3.975, while the '68 is 3.87 x 4.25 inches. Because the bore dimension is squared in the formula, small changes in it make for large differences in taxable hp and, in your case, the windfall of \$6.

This peculiar method of figuring hp dates back to the time of the earliest automobile when tax assessors, with typical bean-counter logic, reasoned that if a man owned a car with, say, 50 hp, he was as well off as if he had 50 horses of the 4-legged kind. This in turn goes back to biblical times when a man's wealth was reckoned by the number of asses and camels he possessed. The trouble was then, as now, that few tax people understood the workings of a dynamometer, so engineers furnished them with a simple formula very much like the one we give above that took into account neither the stroke nor the displacement of the engine.

The answers given by the formula weren't nearly so absurd then as they are now because engines were limited to about 1000 rpm maximum by low-strength materials used to make them. Metallurgical advances have long since laid the validity of the formula to rest, but like death and taxes, it seems that it will always be with us.

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When the seals on my previous car's manual steering gear box started to leak I was advised to put chassis lube in it which worked but made steering hard in winter. When my present car developed the same trouble, I wanted something better. By inquiring around I found that Ford has, in a collapsible tube, a "Special Steering Gear Lubricant," C3AZ-19578-A. To use it I took out the lowest cover bolt as well as the filler plug. With the tip of the tube in the bolt hole, the grease being squeezed in flushed most of the oil out through the filler hole. That solved my problem.

pulling brakes\$

In trying to locate the cause of brake pull or swerve and the problem remains after checking the cylinders, springs, linings and lines, try swapping sides with the suspected drums (usually front). Be careful to retain the bearings (and hub if the drum is separable) with the same drum as a unit. Use a 4 lbs.-ft. preload torque on the bearings when installing. This will nearly always cure the brake pull. If not, defective bearing(s) or bent spindle(s) are to blame.
Thomas J. Jordan Ypsilanti, Mich.

bucks for tips\$

Want to make a quick 10-spot? All you have to do is jot down an automotive performance tip and send it to "Q&A," MOTOR TREND Magazine 8490 Sunset Blvd., Los Angeles, Calif. 90069. For each tip selected and used in this column, Q&A will award \$10, but none submitted can be returned or acknowledged, nor can MOTOR TREND assume any liability.

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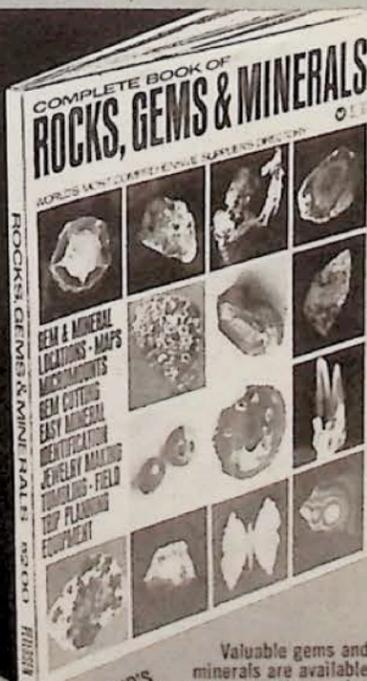
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Santa's little helper

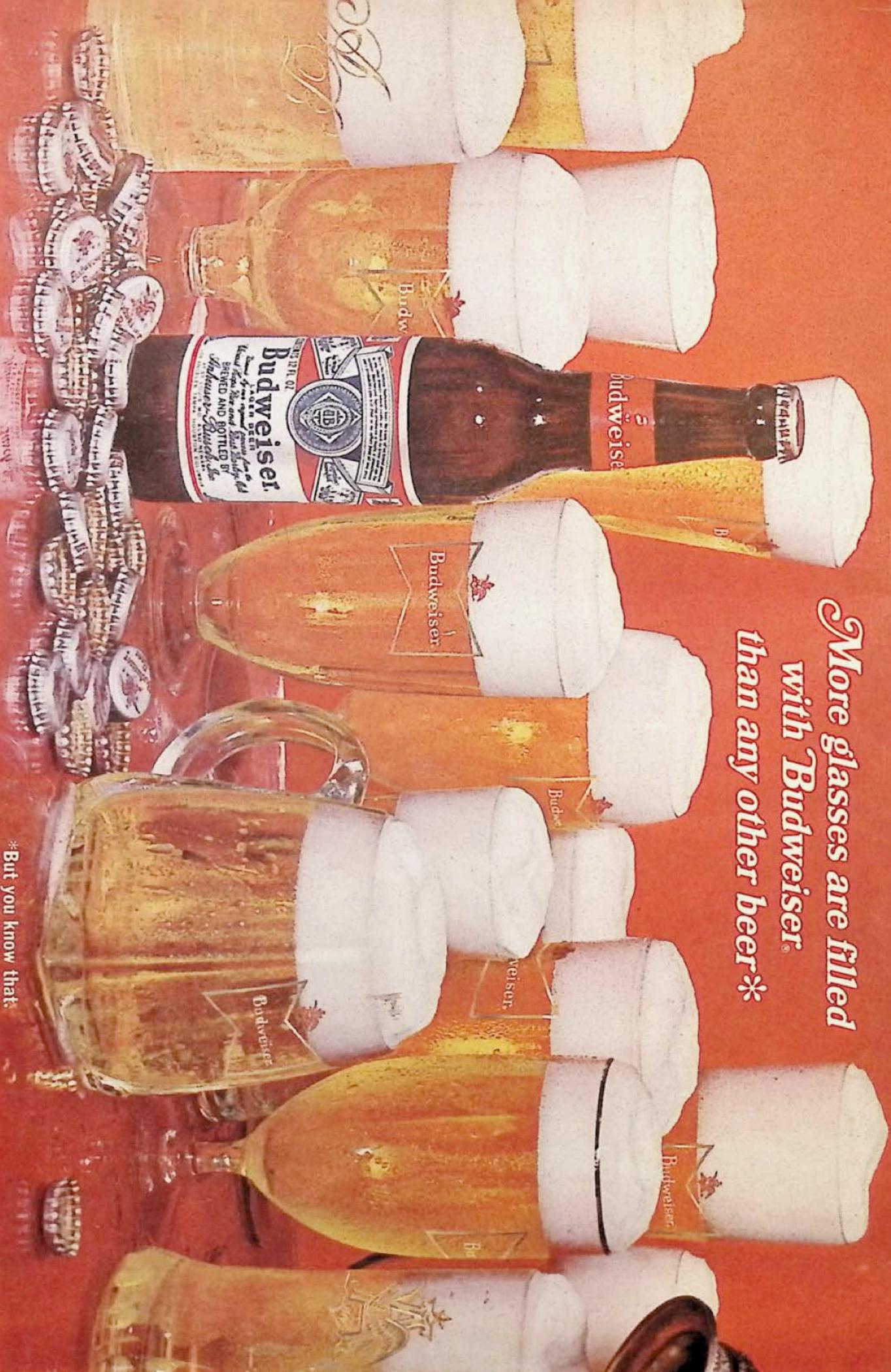
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