CREATING A SPORTS CAR

SPORTS CAR GRAPHIC

AUGUST 1968

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MOTORING IN THE YEAR 2000

What will it be like?

50¢

COMPETITION: INDIANAPOLIS MONACO GRAND PRIX

Will Detroit Build This Car?

WHAT!

Three Wheelers Again?

Confessions of a red-blooded racing driver, or

How the Insistent Metal from Alcoa puts more pizazz in today's automobiles

One day, we asked a racing-car driver how he felt about Alcoa® Aluminum automotive parts.

"Alcoa Aluminum's a winner!" he roared over the engine. "It's light. Strong, too. Now take last year at Indy . . ."

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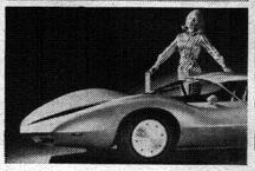
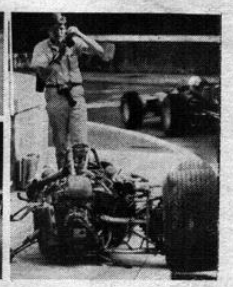
In the words of the red-blooded racing driver, "Other metals look pale by comparison!"

Change for the better with Alcoa Aluminum

ALCOA

SPORTS CAR GRAPHIC



AUGUST 1968 Volume 8 Number 8

ROAD TEST

FEATURES

TECHNICAL

COMPETITION

DEPARTMENTS

Gettysburg, Pennsylvania, is the setting for our cover shot this month, taken by Petersen Publishing Company photographer Pat Brollier. The car drew much attention and, while shooting this picture, one forest ranger stopped and was anxious to buy. Found out later that he raced an Alfa Romeo in amateur races, and felt pretty much the same way we did about the Thor — Detroit should build something like it.

INSIGHT

T. C. Browne

Hemingway had his Moveable Feast, Gertrude Stein had her Rose, Rose, Rose traveling into eternity, and now SCG clings to the coattails of fame with its Wandering Pine Bough – a superb example of man's emulation of natural, growing things in the fine form of one T. C. Browne, the latest and most flowering addition to SCG's staff of budding, sports-minded literary geniuses.

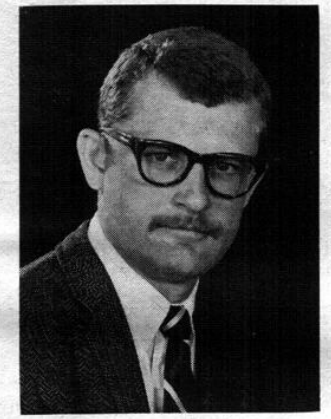
The magnificently mustachioed Mr. Browne (better known within the trade as "T.C.") has been named PUBLISHER of SCG; his arrival portends a new era of interesting, authoritative, and enlightened reading for friends both old and new of this magazine. We say interesting, because not only is T.C. himself a singular individual worthy of comment, but he seeks out and attracts interesting people, subjects and situations involved in the automotive sports world.

We say authoritative, because he brings to SCG a background of experience and successful endeavor in the sports-motoring and publication fields. Immediately prior to assuming his present position, T.C. was Western Manager for *Car and Driver;* earlier activities include Chairman of the Northern California Sports Car Council, Coordinator for Publicity and Promotion of the SCCA Laguna Seca races, and writer-columnist for *The Wheeler, Sports Car Highlights,* and *Sports Car Views* – all sports-motoring publications. Hopefully, some of the knowledge he has acquired along the way will filter down through the staff and manifest itself in the editorial and photographic content of Your Favorite Sports Car Magazine.

We say enlightened, because by nature T.C. is an honest-to-God free soul. And by that we don't mean he comes cheap, but that his personal philosophy is one of tolerance and belief in the ability, good works, and independence of man (which includes women, too). He is cognizant of and acknowledges the foibles of the human animal, but motorcycle tours of Europe, the Middle East, and North American areas have convinced him that individual men have more in common with their neighbors than they suspect.

A lesser man might become rather puffy in the head after such an introduction – but we suspect that T.C. recognizes a challenge in almost any form. This challenge is an opportunity, not only for himself, but for the complete SCG staff.

His optimism is contagious; the road is clear, the engine is firing on all cylinders, and good things lie just around the bend.



Ted West

Another world traveler of ill repute is our new Feature Editor, Ted West. (Yes, you're right . . . things are changing at SCG.) In the photograph above, Ted looks rather serious, but it's only a front. No graduate of the Dinky Toy School of Automotive Design could possibly be that sad about the way things are.

A native of Preston, Ontario, Canada, Ted attended various schools in Washington, Oregon, California, and Minnesota before returning to California for his advanced education. Besides being single, age 25, and a graduate of the University of California at Santa Barbara (in addition to Dinky), Ted has devoted six months of his young life to touring in Europe, and untold hours at pounding out free-lance manuscripts for automotive magazines. He admits to being brash, egotistical, and unconcerned about setting "goals," but even bad apples appeal to worms, and Ted's saving grace is his interest in sports cars. He has owned several, now leans toward Porsche, but will drive anything with a floor shift and no cigarette lighter.

Unfortunately, some late-model, rapid-cornering cars now have weed starters, and Ted is having trouble adapting to the changing scene. Perhaps that's why he looks so sad. We'll be looking forward to seeing his work in print, and, hopefully, you will too.

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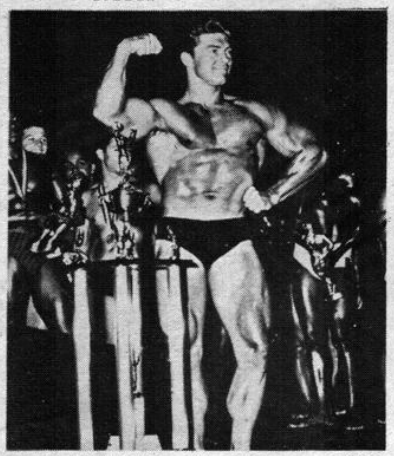
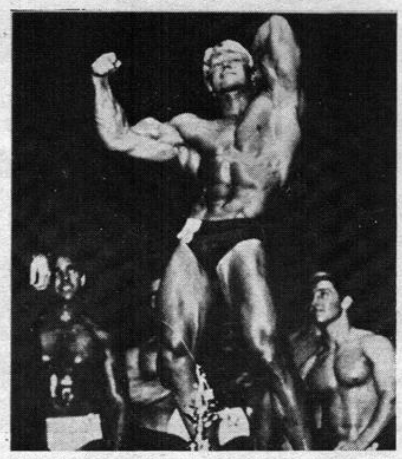
WHAT DO THESE CHAMPIONS HAVE IN COMMON...WITH YOU?

MR. OLYMPIA



LARRY SCOTT, "Mr. Olympia" was a 136-lb. skinny weakling. He wrote for my **free "Dial-A-Body" wheel** and information — **just as you should** — and now weighs 205 lbs. with 20-inch arms! One of the world's best-built men ever! **How about you?**

MR. AMERICA



DAVE DRAPER, "Mr. America" once was a fat boy — weighing 255 lbs. Then he sent for my **free "Dial-A-Body" wheel** and information — now he weighs 235 lbs. with 20½" arms, a 55" chest, 32" waist. A real champ! **Why wait? Rush!**

MR. UNIVERSE

REG LEWIS, "Mr. Universe" was kicked around because of being skinny . . . only 138 lbs. and weak. But he sent for my **free "Dial-A-Body"** and information, too—now he weighs 205 lbs. and is a real champ! **Why not you?**

THEY ANSWERED A WEIDER AD . . . AND IN 7 SHORT WEEKS ADDED 3" TO THEIR ARMS—4" TO THEIR CHESTS WITH THE AMAZING "DIAL-A-BODY"!

JOE WEIDER
Personal trainer of "Mr. America" "Mr. Universe" "Mr. Canada" perfect men title winners since 1936 — and over 2,000,000 successful pupils the world over!

You, too—just like these champions—can now use the New, Exclusive patented "Mr. America DIAL-A-BODY" wheel to show you the way to a handsome, muscular body—FAST! A quick turn of the dial and "DIAL-A-BODY" shows you how to instantly slap 4 inches to your chest, 3 inches to each arm, give yourself lifeguard shoulders, muscularize your waist, get speedy legs. It's simple, there's nothing complicated—just downright enjoyable!

I don't care if, today, you own the scraggiest, flabbiest or funniest body—whether you're short or tall, young or not-so-young. If you send for my absolutely free, revolutionary "DIAL-A-BODY" and 32-page book of muscle-building information, I guarantee that virtually overnight you'll experience a muscle-building miracle! Before your eyes you'll see handsome muscles bursting out all over you. They'll ripple with power, burst with energy—and for the first time in your life men will envy your body, women admire it, because at last you own a body that brings you fame instead of shame. Let my "DIAL-A-BODY" help you as it did these champions—who were also weaklings—to put an end to your weakness and shame. Write now for my FREE "Mr. America DIAL-A-BODY" and big FREE 32-page book—you'll be so happy you did! After all, you have nothing to lose but your weakness!

A-C-T-I-O-N is the key to strength — make your first He-Man Decision NOW! Fill out the coupon right now, rush it to me, and in hours I'll send you absolutely free—at my own expense—the exact same muscle-building information I sent to these numerous champions and to over 5-million other successful students . . . PLUS my fabulous "DIAL-A-BODY" wheel to help speed your muscle-building results. I'm known as the most successful trainer of champions. I've been turning weaklings into "Mr. Americas" and "Mr. Universes" successfully since 1936. Don't pass up this once-in-a-lifetime offer to trade in your body for the one you've always dreamed of having. Remember, you'll be following in the proven, safe, scientific footsteps of the World's Best Built Men. So hurry! Put an end to your weakness now! Send for my sensational FREE "DIAL-A-BODY" and book offer—good only to males between 13 and 75 in normal good health. This is the most time-tested, result-producing course of all time!

FREE!... 2 MUSCLE BUILDING GIFTS!

Makes Building Your Body—Using the champs secrets—revealed here for the first time—AS EASY AS DIALING YOUR PHONE!

Gift 1
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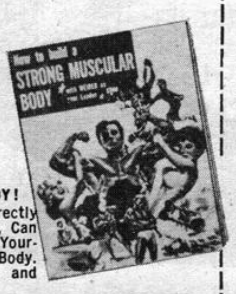
One Turn On This Wheel Shows You How To Build Bigger Arms, Deeper Chest, Broader Shoulders! Makes Muscle Building FUN!

Gift 2
How to build a STRONG MUSCULAR BODY!
Here The Champs Talk Directly To You, On How You, Too, Can Use Their Secrets to Build Yourself A Strong Muscular Body. 32 Pages Full Of Photos and Muscle Building Tips!



JOE WEIDER, Dept. 136-88DB
Trainer of Champions since 1936
531-32nd Street, Union City, N. J. 07087

Dear Joe: Shoot The Works! Thanks for making available to me FREE your 2 Exclusive and Patented Secret Gifts—That I can Use Instantly At Home To Build Myself A Handsome Rugged Body! I am enclosing only 25c to cover handling and mailing charges! I am under no further obligation in any way.

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THIS IS AN OUTRIGHT GIFT...YOU'RE UNDER NO OBLIGATION...NOTHING TO BUY!

OUR OPINION

"Let there be light"

One of our favorite places for high-speed runs is on El Mirage dry lake in California. The site was used for land-speed record runs several years ago, but eventually was abandoned for safety reasons. Now, the desolate, dusty lake bed is used by delivery trucks and some of the local citizens as a short cut from one highway to another.

El Mirage has a good, hard surface, and one can see for miles in any direction. Because of its level surface, isolation from other vehicles, and length (not to mention no speed limit), the lake bed is ideal for top-speed clockings. Otherwise we'd have to travel several hundred miles to get to Nevada (no speed limit there, either).

One thing we never tried until recently, however, was driving fast at night on an unmarked, *totally* dark dry lake bed. And it was this experience that prompted us to check on effectiveness of production headlights. Driving a Toyota 2000 GT over the lake at night made us realize how inadequate today's lighting systems in the United States really are. The Toyota's poor headlights were that much worse at 130 miles per hour. On the lake bed, there were no street lights or road-side reflectors to tell us when to turn and in which direction a dangerous protrusion might lie. It took us only a few miles at over 100 mph of not knowing where we were going to lose courage. By overriding our headlights as badly as we were, we wouldn't have seen an object ahead until we hit it.

On racing cars, special quartz-iodine bulb-type lights are used which cast a beam that carries for more than a mile, instead of 400 feet. Yet, bulb-type lights are illegal in most states, primarily because of non-durability and ineffectiveness, according to a California Highway Patrol officer we talked with about the subject. And, he also added that sealed beams provide more light. Ooops . . . now wait a minute! How could 400 feet be farther than a mile?

At Sebring, we talked with several drivers about night racing, and all agreed that there was little trouble with the quartz-iodine bulbs. In fact, using these lights made the surroundings seem like daylight.

We wanted to know more about these competition lights, so we talked with Charles Sinclair, sales manager for the EFPE Company of Harper Woods, Michigan, a distributor for CIBIE lights. Now, Charlie's a nice fellow, but he likes to talk a lot—which isn't bad at all if you're seeking information.

One of Charlie's biggest hang-ups is his bitterness toward legislators who outlaw the bulb-type light his company markets. Which is understandable. But then, when I told him that, according to the law, quartz-iodine units aren't as good as sealed beams, he was furious and gave us a demonstration . . . which was something we were anxious to get anyway.

Charlie owns a Corvair in which he has installed a bulb conversion unit for the high beam. We took a standard Toronado and tried the brights. With the Toronado's headlights on bright, the beam flashed out an area about 500 feet ahead of us. Then Charlie set his Corvair alongside. There was no comparison. The beam from the Corvair completely obliterated the Toronado headlights and lit up the darkness a quarter of a mile beyond and on each side of the road.

There would be a problem with this bulb light, however—and that would come from those idiots who fail to dim their headlights to oncoming traffic. We tried driving toward the Corvair and were completely blinded. Other than failure by many drivers to dim, that's about the only *serious* fault we can find with the quartz-iodine bulb.

The quartz-iodine bulb itself is rather sensitive and should not be touched, because that creates a hot spot on the quartz surface which can shorten the bulb life to only about 20 hours. The iodine gas within the quartz bulb helps return the burned-off particles to the tungsten filament. On a sealed beam, the burned tungsten particles imbed into the reflector, causing the yellowish tint we often see in headlights.

The beam itself can be focused in almost any direction by judicious positioning of the reflector and flutes, which are those criss-cross impressions on the headlight lens. Also, a shading device can be used around the bulb to further divert the beam in whichever direction one wants it.

Sinclair provided us with some figures he claims came from independent studies and from EFPE's own research file. Here are some of the distance figures he gave:

Sealed beam (low)	**200 ft.**
Sealed beam (high)	**350 ft.**
Standard bulb (low)	**500 ft.**
Standard bulb (high)	**2000 ft.**
Iodine beam (high)	**4000 ft.**
Driving lights	**7000 ft.**

According to these figures, the sealed-beam unit which most state legislative bodies prefer is not what it's supposed to be.

Sinclair claims that a problem that has long plagued drivers is inadequate light to the side. "Many early driving lights had 'pencil' beams," he said. "These produce reasonable distances (a half mile), but throw no light to the side: the driver thinks he's in a tunnel. This produces fatigue and eye strain. Now, with the iodine lights (most no longer use quartz glass), it is possible to give increased distance while still lighting up the sides of the road."

It seems to us that the government should do more investigating on bulb-type lights to determine whether they still have the deficiencies they had 25 years ago, when most states began to require sealed beams because they proved to be superior to the bulb headlight. But that was 25 years ago!

Better lighting would go a long way toward curbing the high accident rate, which is now so prevalent in night driving. Maybe the bulb headlight is not the answer, but it might be better than what's available now on the dimly lit automobiles in America!

Fast. Faster than fast.

Recently we brought out a new BMW, the newest in a line that stretches back through 50 years of building great automobiles: the model 1600. That's it on the left.

When Car and Driver tested the 1600, with its magnificent engineering, superb appointments and 100-miles-an-hour cruising speed, they called it the best $2500 sedan they'd ever driven.

Now we've brought out another new BMW. That's the one on the right, and we call it the 2002.

This new car is the same beautifully-crafted sedan as the 1600, with one exception. It mounts our big, hairy-chested 2-litre engine.

Do you know what that means? Let Car and Driver tell you. The April 1968 issue of the magazine says, and we quote, "If the 1600 was the best $2500 sedan Car and Driver ever tested, the 2002 is most certainly the best $2850 sedan in the whole cotton-picking world!"

Want to see what a kick it is to drive the best $2850 sedan in the whole cotton-picking world? See your BMW dealer.

Suggested retail prices start at **$2,597** P.O.E. New York. U.S. Importer: **Hoffman** Motors Corporation, 375 Park Avenue, New York, N.Y., 1862 S. La Cienega Blvd., Los Angeles, Calif. Dealers coast to coast. Advantageous European Delivery Program. Write for free brochure.

Bavarian Motor Works

The Sportsman's Car

YOUR OPINION

Howmet TX sounds like police car

John Blunsden thinks the Howmet TX sounds "interesting," does he (June, p. 32)? I saw the turbine run at Cumberland – how can an enthusiast get turned on about a racer that sounds like a police car?

Seriously, though, the Howmet is quite fast. You don't realize how fast it is until you watch it thunder (shriek?) through a fast sweeper.

You guys improve SCG every issue – keep this up and I'll even subscribe!

Larry Chambers
Rockville, Maryland

(Don't do anything drastic, now. If you think the Howmet TX shrieks, wait 'till you hear yourself after you see our next issue – Ed.)

We're No. 2, too

Fantastic! There is only one publication in my opinion better than this one. Automobile Year. But, if you start in the next issue of Competition Year to use color pictures . . . maybe . . .

Hugo Desdier Ordaz
Guadalajara, Jalisco, Mexico

***(Shucks, we had to leave some room for** improvement, because when you're number 1, the only way you can go is down – Ed.)*

Smog pump bump

Does federal law require the infamous smog pump to be installed and operative on a 1968 car which was manufactured and licensed before 1 January '68? If I can legally disconnect the thing, can you suggest how I might prove this to the dealer?

Andy Oberta
Phoenixville, Pennsylvania

(To our knowledge the federal law on exhaust emission controls has two provisions applying to smog devices. If the manufacturer of your car has designated it a "1968 model," then no matter when the car was actually manufactured, the smog pump must stay. If the manufacturer does not designate a "model-year" title for each car (as is often the case with imports), then the date of manufacture becomes important. For example, if you purchased a Zapzoom 305 that was manufactured before January 1, 1968, and the manufacturer did not call it a "1968 Zapzoom 305," and if it was proven to the Customs Officer's satisfaction on entry into the U.S. that the car had been made previous to January 1, 1968, then the smog device can be removed. Of course, some states (such as California) amend federal laws concerning smog controls. It would be a good idea to check the statutes in your own state – Ed.)

Lost sleep

I have just read your report on the AMX, and think it is the best report on this car that I have read yet. Being a native of Kenosha, Wisc., I am very interested in all AMC products. One problem, however. You state that "a new box, known as the Warner T10, was developed . . ." (March SCG, p. 56, col. 3). Wasn't the T10 developed for the Corvette in the mid-1950s? Could you please explain this detail, as I am losing sleep over it because I'm sure the T10 isn't really a new trans.

Tom Finkler
Houghton, Michigan

(You are exactly right, Tom, so get some rest. The T10 was developed for the Corvette. What we meant was that the gearbox was new for the AMX. It had never been used by American Motors in production cars before – Ed.)

Saab needs power

I recently bought a Saab Sonett, and this car is in definite need of a power increase. It has the V-4 German Ford engine. Are there any sources for speed parts for this engine? Do you think anyone at Ford could supply parts from the Cardinal program? How about some German supplier?

Robert Reil
Castleton, Vermont

(First, read our Saab story (joke) in this issue, beginning on page 24. Then, if you still want to increase power, you might try writing to Ford-Werke AG, Henry-Ford-Strasse 1, 5 Koln-Niehl, Germany. They should be able to give you some pointers – Ed.)

Porsche Police

In your April '68 copy is an error I would like to correct. On page 12 in "Around the World in 30 Days" you have printed an article about Porsches being used by police forces, and show a picture of a police-Porsche with the word "POLIZEI" on the door. In the article you speak about the Dutch police, but surely you should know that it is the German word for police (for your information, the Dutch word for police is "POLITIE"). The difference is too big. However, the Dutch state police do use Porsches, mainly on their highway patrols.

P. A. van Seleler
The Hague, Netherlands

(You've got sharp eyes, fellow. However, since at least eight countries use Porsches for their police cars, we figure the Porsche people used their own word for police instead of listing them all on the same door. Perhaps we didn't explain that properly in the article – Ed.)

Jaguar vs. Marcos

I have been contemplating buying a Jaguar XK-E through my brother in the service, who is presently stationed in England. He advised me to buy a Marcos 1600 GT, which is in limited production. Could you give me any information on this car and tell me if, in your opinion, a Jaguar would be a better choice for a little more money.

Brendt Manning
Sewart AFB, Tennessee

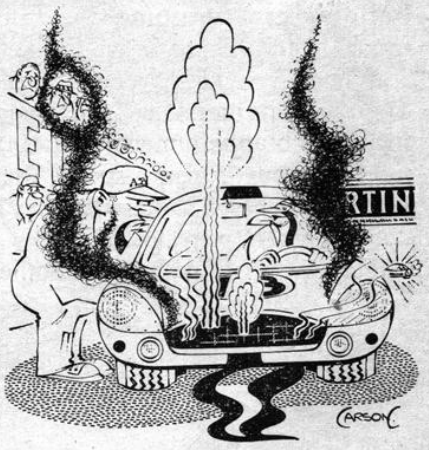
(We have not tested the Marcos, therefore cannot say which is the better buy. Certainly the Marcos is more exotic, although possibly illegal in this country under federal safety statutes. The body is of plywood, and the car is currently powered by a Volvo engine. In component form, the Marcos sells for about $4500 in England, more in the U.S. In finished form, it costs considerably more. Suggest you contact Marcos Cars Ltd., Greenland Mills, Bradford-on-Avon, Wiltshire, England – Ed.)

Results really hurt

Two days before I received your magazine (May '68), I purchased a 1968 TR-250. I read your article with interest; however, not always in agreement. When I read the acceleration results, it really hurt. If it will go from 0-70 mph in 13.4 seconds, surely it is not going to take 38.6 to go from 0-80 mph, and 0-90 mph in 55.4 seconds. If it did take this long, I suggest you have a mechanic inspect your car. Please correct this atrocity.

S.L.K.
New Oxford, Pennsylvania

(What! You mean you think the TR 250 is faster than the figures we showed? Well, you're right! Generally, the 0-80 time will be about 18 seconds, and the 0-90 about 25 seconds. But it didn't work that way on our test car. You want we should lie, maybe! – Ed.)



"Get tucked in behind one of the Porsches!"

TORQUE IT UP

When you turn on your engine you want to turn out the power. But you can't thrust your car when your engine's fighting friction.

STP Oil Treatment combats that friction. STP is a super concentrate so strong it clings to your engine's metal parts without breaking down or draining off. By cutting friction to a fraction, STP takes the chains off your engine. And keeps it running cooler, quieter, smoother, longer.

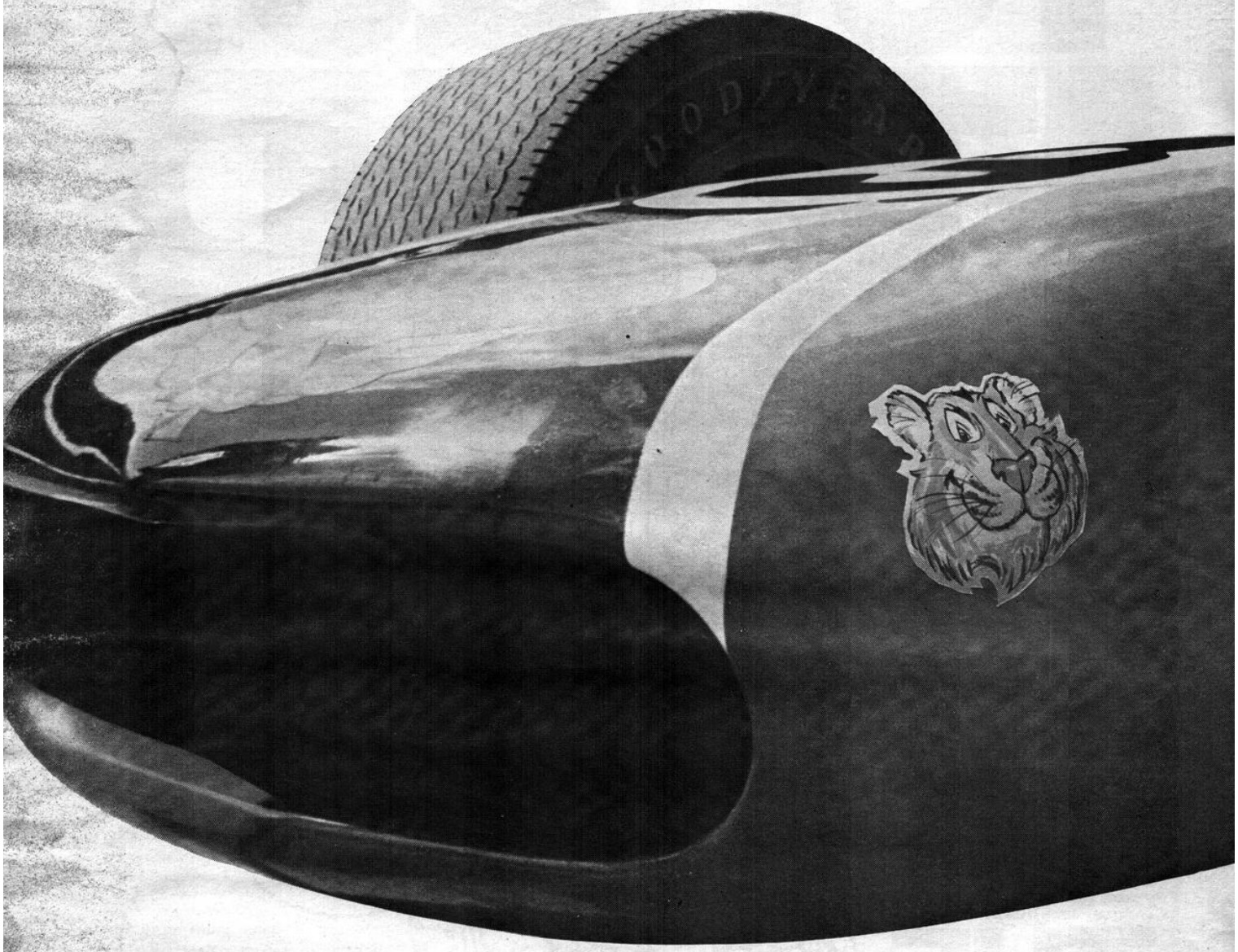
Leading race car drivers like A. J. Foyt, Mario Andretti, Dennis Hulme, and Parnelli Jones swear by STP. They're smooth torquers from the word "go."

Ask your gas station attendant to add STP to your motor oil. At $1.35, torque is cheap.

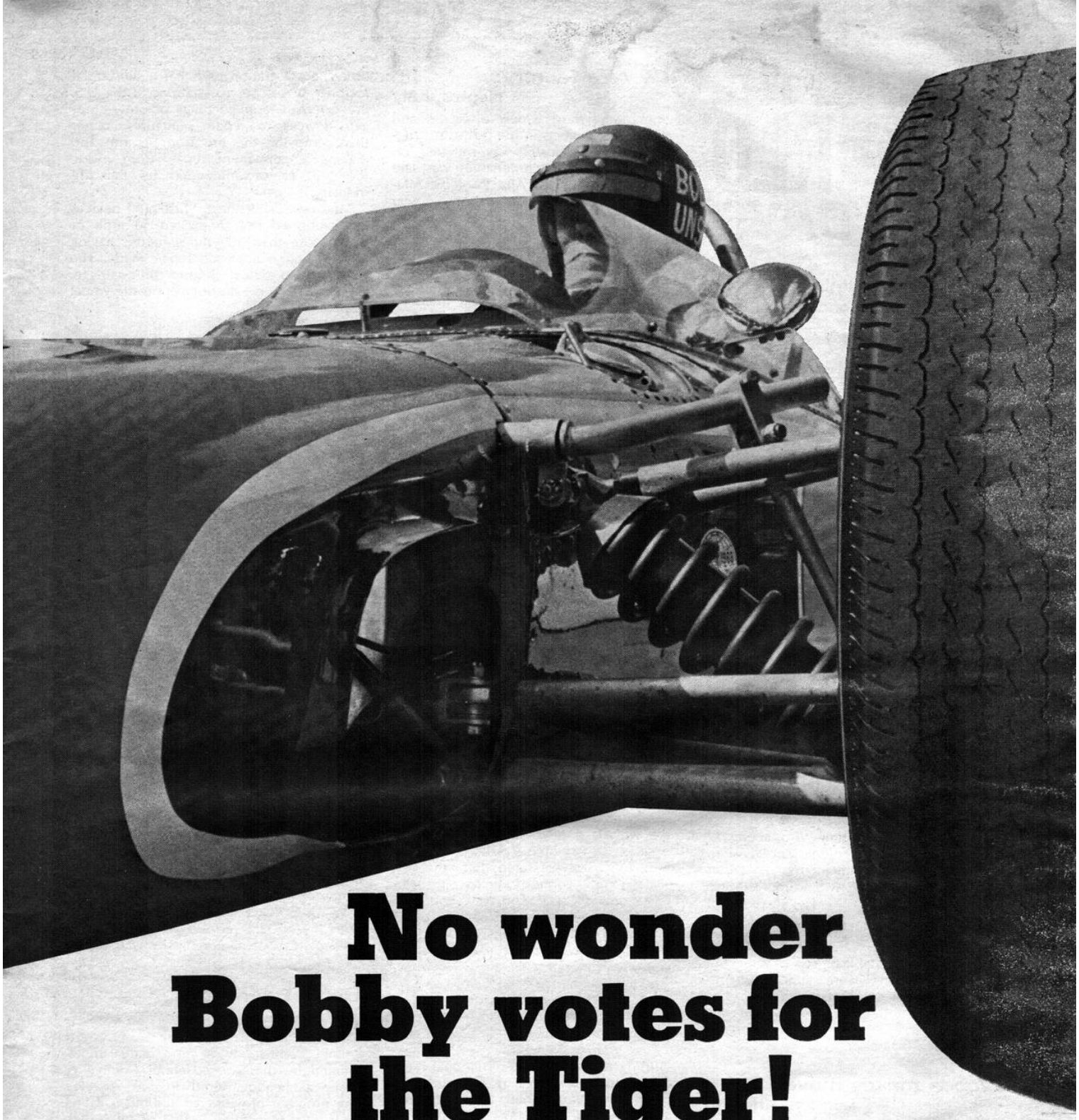
THE RACER'S EDGE

STP Corporation,
125 Oakton Street
Des Plaines, Illinois 60018

Bobby Unser wins the "Indy 500!"



This event was conducted under the auspices of the United States Auto Club.



No wonder Bobby votes for the Tiger!

You can bet "Indy" winner Bobby Unser is casting his vote for the Tiger. Because the Esso Tiger powered Bobby into the winner's circle at Indianapolis with an average speed of more than 152 miles per hour. And in a car with a conventional piston-driven engine, similar to the engine in your own car.

Whichever way your sentiments lie in the great Tiger Election, we hope you'll stop by your nearest Esso station soon. While you're there, fill up with High-energy Esso Extra. The same people who blend Bobby Unser's racing fuel and provide him with special lubricants also blend this great premium gasoline for extra power, cleaner engines at the Sign of "Happy Motoring."® Two more good reasons why Bobby Unser votes for the Tiger.

ESSO

Put a Tiger in Your Tank®!

Humble Oil & Refining Company . . . America's Leading Energy Company

AROUND THE WORLD IN 30 DAYS

BLMC streamlining

London, England

The British Leyland Motor Corporation, which officially came into being last May 12th, is to be operated through seven divisions, with the creation of a central staff to provide specialized services such as public relations, marketing services, and economic planning.

The seven operating divisions are: Volume Car and Light Commercial Vehicle (BMC); Specialised Car (Triumph Vehicle and Jaguar); Truck and Bus (Leyland, Guy, Daimler); Pressed Steel Fisher (body building); Overseas; General Engineering and Foundries; and Construction Equipment.

An interesting appointment is that of Harry Webster, formerly chief engineer of Standard-Triumph, as Executive Chief Engineer of the Volume Car Division, and as a director of BMC. His place at Standard-Triumph has been taken by Spencer King, formerly Chief Design Engineer of Rover. Harry Webster, a great sports car enthusiast, is also a very talented engineer who is full of progressive ideas. In his new position with British Leyland, he should have a wonderful opportunity for developing some great things.

Having given notice that a number of other key appointments will be announced during the coming months, it is significant that Sir Donald Stokes, BLMC's Chief Executive, is in the meantime also acting as Chief Executive of the Volume Car Division, which suggests that a major reorganization is under way for what was formerly BMC.

Jim Clark Foundation

Duns, Scotland

Plans for the establishment of the "Jim Clark Foundation" were announced recently by James Clark, father of the late World Champion. The objective of the foundation will be to "foster and finance road safety research."

Woods makes move

London, England

Aubrey Woods, designer of the three-liter V-12 Gurney-Weslake engine used in the Formula 1 Eagles, has been appointed chief designer for the Anglo-American Racers, which is now independent of Weslake and Company and based in new premises at Ashford, Kent. Before joining Weslake at the end of 1961, Woods was with BRM. He designed the 1½-liter V-8 engine which Graham Hill used to win the 1962 world championship. AAR is now building its own F1 engines. Its latest V-12, though basically similar to the 1967 engines, has undergone many detailed changes and carries the words "Eagle Mark 1A" on the cam covers.

New Alfa factory

Naples, Italy

One of the most widely discussed and long-awaited projects in the post-war progress of Italian industry was initiated on April 29, when the cornerstone was laid for the foundation of Alfa Romeo's Alfa-Sud plant in Pomigliano d'Arco, near Naples. The new plant, a vast structure built on an area of 584 acres, will contain 102 acres of building space with a volume of 116 million cubic feet.

The factory is designed to produce 1,000 automobiles a day, mostly cars intended for export to all parts of the world, particularly Africa and the Orient, featuring rear-wheel drive with a transverse engine. The south of Italy, long its poorest and most underdeveloped region, will benefit enormously by the new plant.

Among those present at the ceremony were Prime Minister of Italy Aldo More, numerous state officials, chief executives of the Institute of Industrial Reconstruction, and the President of Alfa Romeo, Dr. Giuseppe Luraghi.

Big money Can-Am

New York, N.Y.

A Championship Point Fund of $126,000 with a first prize of $40,000 was announced by the Sports Car Club of America for this (the third) year's Canadian-American Challenge Cup Series of International auto races. Total awards of more than $526,000 were predicted for the fall series of one Canadian and five American contests.

In last year's series, 1st place winner Bruce McLaren collected nearly $100,000, and his co-driver on Team McLaren, Denny Hulme, won an additional $65,000 for taking second.

John M. Bishop, executive director of the SCCA, which sanctions the Can-Am, said there will be a new Canadian circuit for the series at Edmonton, Alberta, in western Canada. Bishop stated that "the Can-Am has rapidly come of age as a first-rank international sports event. New course attendance records were set at four of the six races in each of the first two years of the Can-Am. We can confidently expect 300,000 spectators for the six 1968 events."

The total guarantee of $346,000 compares with $300,000 last year. In addition, SCCA anticipates that $180,000 will be posted in manufacturers' contingent awards, making a grand total of $526,000.

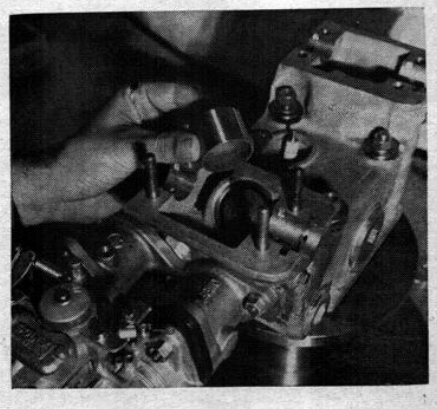
Stirling Moss, famed international racing figure who now serves as racing director of Johnson Wax, called the widespread interest by both spectators and drivers in the Can-Am a "remarkable" development in international sport. He said, "The huge amount of money being offered in the Can-Am is unprecedented in the history of sports car racing, and indicates even greater things for the future of international racing on this continent."

Don't use plugs

New York, N.Y.

The Rubber Manufacturers Association issued a warning to motorists and service stations against repairing flat tires with rubber plugs inserted from outside the tire. The association said that a substantial majority of tire service stations in the U.S. use externally-applied plugs or other stop-gap devices to repair punctures, rather than removing the tire from its rim and making a permanent repair from inside the tire, as recommended by the tire industry.

Motorists using these "first aid" devices are cautioned not to exceed 50 mph or drive more than 100 miles before having a permanent vulcanized repair made. The only way to detect internal tire damage, says RMA, is through off-the-wheel inspection.



Carburetor adjustor

Sydney, Australia

Ford Motor Company of Australia is planning to build an assembly plant in Papua-New Guinea for producing items to fit the needs of the area. Among such items are a carburetor adjustor, new suspension systems, and special tires. The carburetor adjustor under study would be particularly appropriate, because of the extremes of altitude in New Guinea. As now proposed, the adjustor will be capable of being operated from the driver's seat. It sounds like the type of thing that could be used elsewhere in the world.

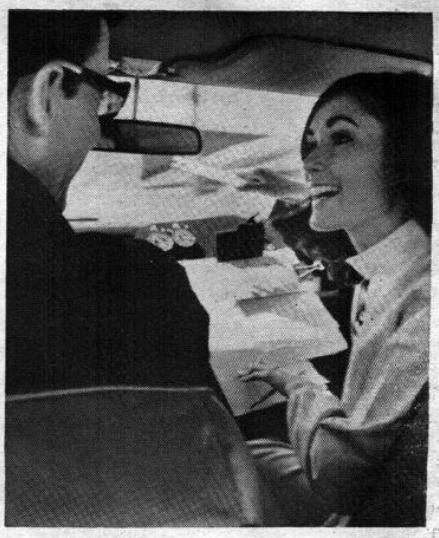
W. D. Bourke, director of Ford's operations in Australia, is also considering possible plant sites at Port Moresby and Lae.

Helmet certification

Los Angeles, Calif.

A new program for motor sports safety helmet certification is now being implemented by the Safety Helmet Council of America, headquartered in Los Angeles. The program provides continuous, off-the-shelf, random-sample testing of safety helmets to the United States of America Standards Institute Z90.1-1966 standard, by several nationally recognized independent testing laboratories.

S.H.C.A. helmet certification is available to all manufacturers of helmets exceeding the Z90.1-1966 standard, which was developed after years of effort by leading engineering and medical specialists in the field of head protection. More information can be obtained from Mr. Gary B. Lovell, Executive Secretary, Safety Helmet Council of America, Suite 506, The Gibraltar Tower, 9107 Wilshire Blvd., Beverly Hills, Calif. 90210.



New rallying cry: "It's a Wide Oval World."

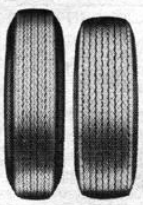
White or Red Stripe.

It's happening at sports car rallies, on the highway and, chances are, right on your own block. Americans are fast discovering that the world of wheels is oval. Wide Oval. The Wide Oval World of Firestone.

Perhaps you've noticed it, too. How tires are getting wider, lower. We started it more than a year ago when we introduced the original Super Sports Wide Oval. A totally new kind of tire.

It's nearly two inches wider than standard tires. It grips better. Starts faster. Corners easier. Runs cooler. Stops 25% quicker. And it gives your car a look of all-out excitement.

Sure, others may look like it, but none begin to perform like it. And it's built with Nylon cord for maximum safety and strength at sustained high speed driving. One of The Safe Tires from Firestone.


Nearly two inches wider than your present tire.

So you see, it's become a Wide Oval World. Firestone Wide Oval. And a whole lot safer for it. Rally around.

WIDE OVAL ®FIRESTONE TM

Firestone The Safe Tire

book review

THE ALFA ROMEO STORY, by Joseph H. Wherry (Chilton Book Company, $4.95)

The Alfa Romeo Story is one of the books in the Chilton Sebring Series on famous marques. This one presents a chronological history of Alfa, from the adoption of the name via Anonima Lombarda Fabrica Automobili in 1910, through its rise to fame under Nicola Romeo, who changed the name to the present Alfa Romeo in 1918, to the forecast of a return to racing glory with the new (at publication time) Type 33.

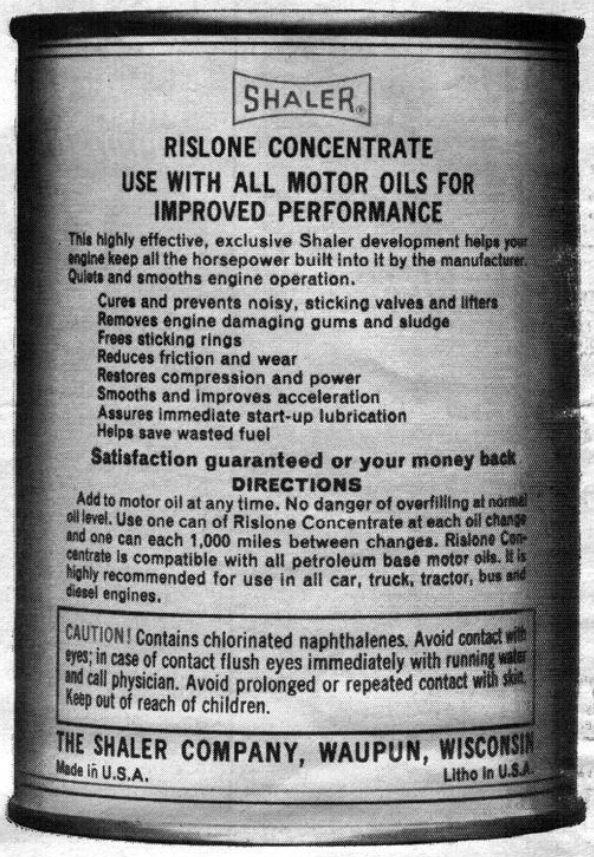
Specifications on 108 models and minute engineering details, including over 100 photographs plus charts of competition successes, give the account a near-textbook style. However, the author also includes sidelights on the personalities that have made Alfa a household word in the world of automotive sports. Names like Enzo Ferrari and Antonio Ascari pop up as team drivers in the early years and later, in 1929, when Scuderia Ferrari was organized by Enzo as a works racing team.

One of the most interesting sections concerns Vittorio Jano and his famous post World War I P2s, which used an eight-cylinder, two-liter engine supplying 144 bhp. Another fascinating bit is the use of four wheel independent suspension, with Porsche-type swing axle half shafts and longitudinal torsion bars in the rear, on the 6C 2300B way back in 1935.

Required reading for *Alfistis, The Alfa Romeo Story* is prime entertainment for anyone who enjoys thoroughbred cars.

MOBIL TRAVEL GUIDES, seven regional volumes (Simon & Shuster, $2.50 each, at Mobil stations and selected book stores)

For the weekend traveler as well as the all-out, vacation-bound group, the *Mobil Travel Guides* are a valuable tool for route planning and selection of motels. Statistics are given on a flock of cities and towns, where to go and what to see, restaurant suggestions, and local tours to points of interest. Included also are excellent up-to-date maps and discount tickets for various items. The motel listings give price and actual description of the facilities as well as address and phone number. We use these guides extensively in our travels for SCG, and we can really recommend them. — Jean Calvin.



BOBBY UNSER
Indianapolis "500" Winner

"With $177,523 at stake, it's no time to test a new product. So I go with the proven ones. That's why when Rislone asked to be my sponsor, I accepted. Rislone is a great oil additive. My dad swore by it at our family service station. Got me to use it when I first started driving... and I've used it ever since. Both in racing and in the family car. It's the only oil additive I know of that protects your engine and keeps it clean."

RUN RISLONE: everytime you change oil, everytime you need oil. At service stations everywhere.

WASHINGTON REPORT

By Robert Herzberg

Buying an Import

Planning to bring a new sports car into the United States? The federal government has issued mandatory regulations on safety and tax requirements that could cost American purchasers of foreign automobiles enough extra time and money as to make such a transaction undesirable.

All motor vehicles and vehicle equipment manufactured after January 1, 1968, for use in the United States must be certified as conforming to applicable federal motor vehicle safety standards, whether manufactured in the United States or in a foreign country. Foreign-made vehicles will be admitted if they bear certification or a label indicating compliance with applicable standards. Be sure your car has one before purchasing it.

Vehicles that may be imported without complying with the safety standards include: vehicles imported solely for purposes of show, test, experiment, competition, repairs or alterations which will not be sold or licensed for use on public roads (this includes racing cars for use on competition circuits); vehicles belonging to foreign tourists, to members of the armed forces of a foreign country on assignment in the United States, to foreign diplomatic personnel, members of United Nations delegations, and members of other public international organizations on assignment in this country; vehicles not manufactured in conformity with applicable standards, but which have since been brought into conformity (must be accompanied with a certificate listing the work performed which brought the vehicle into conformity); and vehicles which do not conform to applicable standards, but which the importer or consignee agrees to bring into conformity within 90 days. If the vehicle is a new car intended for sale to the public, and does not conform because it lacks readily attachable equipment items, then it must have a label on its windshield stating the extent of the non-conformity and that it will be brought into conformity before being offered for sale or use.

A manufacturers' excise tax is collected on cars imported into this country by individual residents. The basis for computing the tax is the total cost of acquiring the vehicle. Such cost includes the purchase price, import duties, customs handling fees, ocean freight, agents' or sales commissions, and any other cost of acquiring the vehicle. Costs that are not to be included in the cost of acquiring the vehicle are state and local use taxes, fees paid for registration or license tags under state law, and any other fee required to be paid for the privilege of operating the automobile on state highways.

Section 48.4218-2(b) of the Manufacturers and Retailers Excise Tax Regulations provides that the tax on use of a taxable article does not apply in cases where an individual incidentally manufactures, produces, or imports a taxable article for his personal use or causes a taxable article to be manufactured, produced, or imported for his personal use.

The Internal Revenue Service was asked for an advisory ruling on four situations. This ruling now has the effect of law:

Situation 1: A resident of the United States, before going abroad to visit a foreign country, enters into a transaction whereby he orders a foreign-made automobile to be delivered to him when he arrives at his foreign destination. This is the so-called "tourist delivery plan" under which the order and payment for the vehicle are forwarded to the foreign automobile manufacturer in advance of the traveler's departure from the United States. The plan included prearranged transportation for the vehicle to the U.S. after the traveler has completed his visit. Upon returning to the U.S., the tourist uses the automobile for personal travel.

Situation 2: A resident of the United States is assigned by his employer to a foreign country for a two-year tour of duty. Upon arrival, he takes up residence and purchases a foreign-made automobile for his own use. At the conclusion of his tour of duty, he brings the vehicle back to the U.S., along with his other personal household goods, for his personal use.

Situation 3: A member of the Armed Forces stationed in a foreign country is reassigned to duty in the U.S. Upon notification of his reassignment, he purchases a foreign-made automobile. At the time of leaving the foreign country, the serviceman brings the vehicle back to the U.S., along with his other personal and household goods, for his personal use.

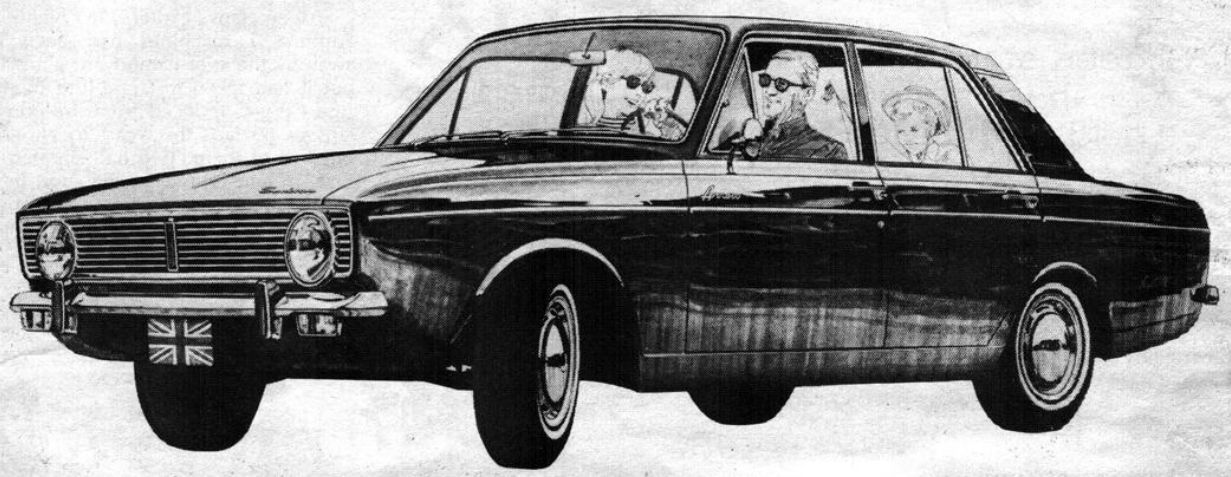
Situation 4: A U.S. resident acquires for his personal use a foreign-made automobile by going to Canada and purchaseing the vehicle from a Canadian dealer. Delivery of the automobile is made in Canada, and the U.S. resident returns to this country in the newly acquired vehicle.

The transactions described in Situations 1, 3, and 4 do not reflect any primary purpose to which the importation could be ascribed as incidental, according to the IRS. Therefore, the tax is collectable.

Under the circumstances described in Situation 2, the Internal Revenue Service found the tax does not apply, because the facts of that situation reflect a purpose to which the importation is considered to be "incidental." The reason for purchase was use in the foreign country.

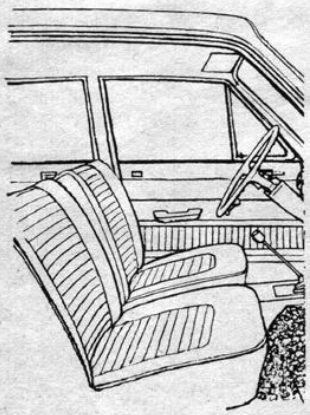
big deal from the mother country

The keenly American Chrysler people who import and back the very British Sunbeam Arrow announce a handsome price reduction due largely to the devaluation of the pound. Britain's sporty sedan is now priced at $2086†. Jolly good.



Arrow could happen only in Britain—where elegance isn't measured by size, and even limousines must be a little nimble.

Now Chrysler Motors Corp. brings it smack into the compact car price range—complete with a 5-year/50,000-mile power train warranty* which *other* American car makers have somehow neglected to apply to *their* imports.

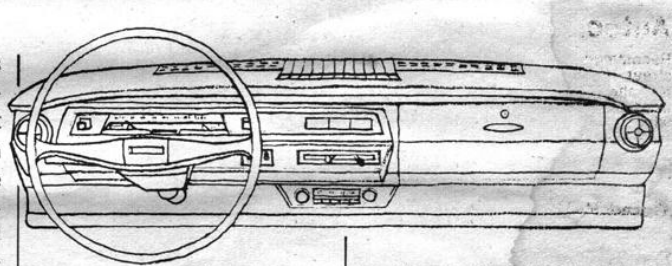


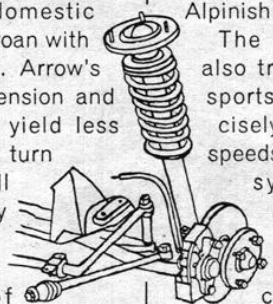
For $2086†, Arrow gives you a baby limousine with luxuries most $2086 cars do not provide. Front buckets with reclining backs. A console between them, and 4-on-the-floor to go with. Adult-sized room in back. Curved glass windows. And a flow-through ventilation system some $3000 American cars would love to have.

On the other hand . . .

For $2086, Arrow is a sports sedan that tools through turns which domestic "sports cars" groan with effort to match. Arrow's new strut suspension and quick steering yield less than a 33½ foot turn circle—and it'll ride steady through it all.

Engine performance, of course, is likely to be equally important to you. So you'll be glad to hear Arrow's is a 73 hp version of the 1725 cc engine which revs up our Alpine sports car. The OHV design still works for you; compression and horsepower are simply toned down. Result: rather spectacular economy along with Alpinish zip through gears.





The gearbox itself is also transplanted from sports cars. Four precisely-ratioed forward speeds, with a powerful synchromesh to smooth things along.

So. If a sports car is now a bit impractical as your next car, see your Sunbeam dealer about Arrow. It's the sports sedan with 5/50 backing from the Chrysler people.

†Manufacturer's suggested retail price, East Coast P.O.E., excluding state and local taxes, destination charges and optional equipment such as whitewall tires. West Coast slightly higher. **FOR MONEY-SAVING EUROPEAN DELIVERY**, ask your dealer about Sunbeam's Overseas Delivery Plan.

***HERE'S HOW THE SUNBEAM ARROW 5-YEAR OR 50,000-MILE ENGINE AND DRIVE TRAIN WARRANTY PROTECTS YOU:** Chrysler Motors Corporation warrants all of the following vital parts of Sunbeam Arrow cars imported by Chrysler for 5 years or 50,000 miles, whichever comes first, during which time any such parts that prove defective in material or workmanship will be replaced or repaired at an Authorized Sunbeam Dealer's place of business without charge for such parts or labor: engine block, head and internal parts, water pump, intake manifold, transmission case and internal parts (excluding manual clutch), drive shaft, universal joints, rear axle and differential, and rear wheel bearings. **HERE'S ALL YOU MUST DO:** Give your car this normal care—change engine oil every 3 months, or 4,000 miles, whichever comes first; replace engine oil filter every second oil change; clean carburetor air filter every 6 months and replace it every 2 years; clean crankcase ventilator valve, and change transmission and axle lubricant every 6 months or 8,000 miles, whichever comes first; *and* every 6 months furnish evidence of this required service to a Chrysler Motors Corporation Authorized Dealer and request him to certify receipt of such evidence and your car's mileage. This warranty shall *not* apply to cars subjected to racing or other sustained high speed use, acceleration trials or wide-open throttle operation, etc.

ROOTES SUNBEAM

CHRYSLER MOTORS CORPORATION

COMPETITION/by John Blunsden

Monaco Grand Prix

Sixteen started, five finished in what could be the last Grand Prix held at the Mediterranean principality

Photos / Rainer Schlegelmilch, Michael Cooper

THE 1968 MONACO GRAND PRIX HAD BEEN RUNNING FOR LESS THAN HALF AN HOUR. It was a familiar scene – the 1.95-mile road course shimmering in the Mediterranean sunlight . . . lined with grandstands filled to capacity . . . luxury hotels offering the privileged few the best view of all from private balconies . . . and, for its traditional backcloth, the yacht-filled harbor and the sea beyond offering a dazzling montage of white and blue. The perfect setting for a Grand Prix, except that something was missing. Cars!

Sixteen laps earlier, 16 highly tuned Formula 1 machines had been flagged away by the ever-flamboyant Louis Chiron, but it had taken just one-fifth of the race (the GP was reduced from the normal 100 laps to 80 laps this year) to eliminate all but five of them. Two had shunted on the first lap and retired on the spot, the tricky Mirabeau Corner claimed two more later on with similar results, a further two

bounced off barriers with the inevitable damage to their suspensions, one broke a gearbox, another a ring and pinion, a third a radius arm, a fourth an engine, and one even managed to break its chassis.

By that time we were wondering whether a GP had ever been won on the basis of who had traveled farthest before retiring, but the attrition didn't become total after all. What might have happened had the race been run over its normal 195 miles is anyone's guess. Only one thing prevented a complete fiasco – a tremendous race-long duel between the winner, Graham Hill, in the latest wedge-shaped Lotus 49B, and BRM's newest recruit, Richard Attwood.

At no time during the 2 hours and 32.3 seconds of the race was Attwood more than 9.5 seconds behind Hill, the three-time past winner and acknowledged master of the very untypical Monaco circuit. For much of the race the gap was less than half of that, and after a final all-out effort on the very last lap, during which he set a new circuit record, he closed to within 2.2 seconds of Hill's Lotus-Ford. It was a brilliant effort from a driver who had appeared only irregularly in Grands Prix, who has not always had the best of cars, and who, frankly, had not been reckoned as being among the GP elite . . . until May 26, 1968.

On that day, Attwood didn't make one wrong move, although there would have been ample time for recovery had he done so – like, say, six minutes. That was the gap between his BRM and the Cooper-BRM of Lucien Bianchi (substituting for Brian Redman, who was busy winning the Spa GP with Jacky Ickx). Bianchi finished third, ahead of teammate Lodovico Scarfiotti, to give Cooper their second successive 3-4 result in a world championship GP. Theirs may be the slowest cars currently racing, and the ones with the most handling problems, but they are certainly the most reliable. And, as they say in the history books, you don't win anything if you don't finish.

Bianchi inherited fourth place from Scarfiotti on lap 42, when the Italian hit the wall by the notorious chicane and limped to the pits with a punctured front tire. Two laps later, Bianchi moved up another place when Denny Hulme, having a lonely drive one lap behind the leading pair in his McLaren-Ford M7A, stopped with a broken driveshaft. The McLaren team had been expecting trouble from this area, having broken three in practice, and they were ready with a spare just in case. But it took them ten minutes to fit it; when Hulme went back into the race, he was within 40 seconds of being lapped for the eighth time, which would have dropped him below the 90-percent minimum qualifying distance for world championship points.

Having traveled round trip between Monaco and Indianapolis in 48 hours, Hulme had arrived back in Europe only a few hours before the start of the GP, and could hardly have been in the mood to hurry. Up to ten laps from the finish, it seemed an odds-on chance that he would not be able to stay ahead of Hill, especially since Attwood was not giving Hill any chance of easing up. But Hulme made a big effort in the closing laps, and was still about five seconds ahead of the Lotus as the black-and-white checkered flag was brandished by Chiron.

There was a disturbing suggestion that this was to be the very last Monaco GP – that it was simply costing too much money to stage the race, not to mention the ever-increasing disruption to local trade as the roads comprising the circuit were sealed off for hours at a time during the four days of practice and the race. It seems that the accountants have been having a close look at the books and have been less than delirious with delight. With a maximum of some 32,000 salable seats in the various grandstands and enclosures, it must be difficult to show a profit, but it is to be hoped that commercial interests will not force this unique event to disappear from the racing calendar. One or two of the other GPs, by all means, but not Monaco!

As usual, there were three practice sessions on consecutive days in which to sort out the various grid positions. The first two were held under ideal conditions, and the third on a wet but gradually drying track, which meant that the Friday "breakfast time" session was the critical one for deciding most grid positions.

Monaco's limit of 16 cars, of which the majority of factory entries receive guaranteed starts, means annual prerace competition for the coveted remaining places by all the unseeded entries. With a total of 18 cars entered for practices, two were certain to be out. After two practice sessions, it seemed as though Bianchi in the second factory Cooper (Scarfiotti's was one of the accepted entries) and Bonnier in last year's McLaren-BRM would be the unlucky ones, and that Moser, in the Repco Brabham with which Hulme had won the race in 1967, would be in the line-up. But the wet weather caught Moser napping, and a terrific effort by both Bonnier and Bianchi on a still-damp track bumped him from the grid. Bonnier was really having a go in the McLaren, but his best was not quite good enough to beat Bianchi. He resigned himself to the role of spectator, although nursing the hope that maybe Hulme would not get back from Indy in time. On race morning, his face dropped a foot when Teddy Mayer of the McLaren team told him the "good" news that Denny was back in town!

Normally the world champion carries the number '1' on his car, but this time the Monaco organizers gave the honor to Jean-Pierre Beltoise's Matra V-12, to mark the first appearance of a genuine all-French GP car in a world championship race since that abortive Bugatti effort in the '50s.

The first Matra MS11 had been completed quite early in the year, and a second almost identical car (though with a modified lubrication system) had been completed barely two weeks before the race. There was never any intention of racing both of them, Beltoise being given the choice of cars and the job of tailoring them to the tight circuit.

The Matra mechanics were kept busy for much of the time, and were particu-

Left to right – A quiet drive through sleepy downtown Monaco . . . boyish open-faced winner Graham Hill . . . a Formula 3 car after extensive mid-race modifications . . . a typical shy cloistered peasant girl selling flowers in the street.

MONACO GRAND PRIX
Continued

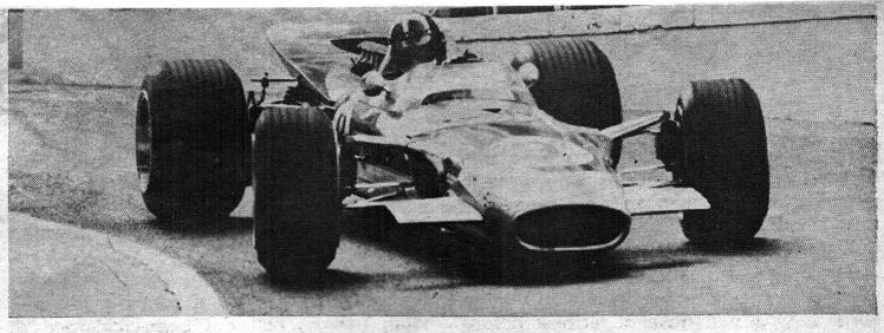
larly preoccupied with cooling problems. The second car had a larger radiator, and it was decided to use this one for the race in conjunction with a short nose-cowl – the healthier engine from the first car being dropped into this chassis before the race. It was anticipated that Matra Sports would go into their first Grand Prix with about 420 bhp, but the team opted for maximum reliability initially, and peak power was pegged at approximately 400 bhp.

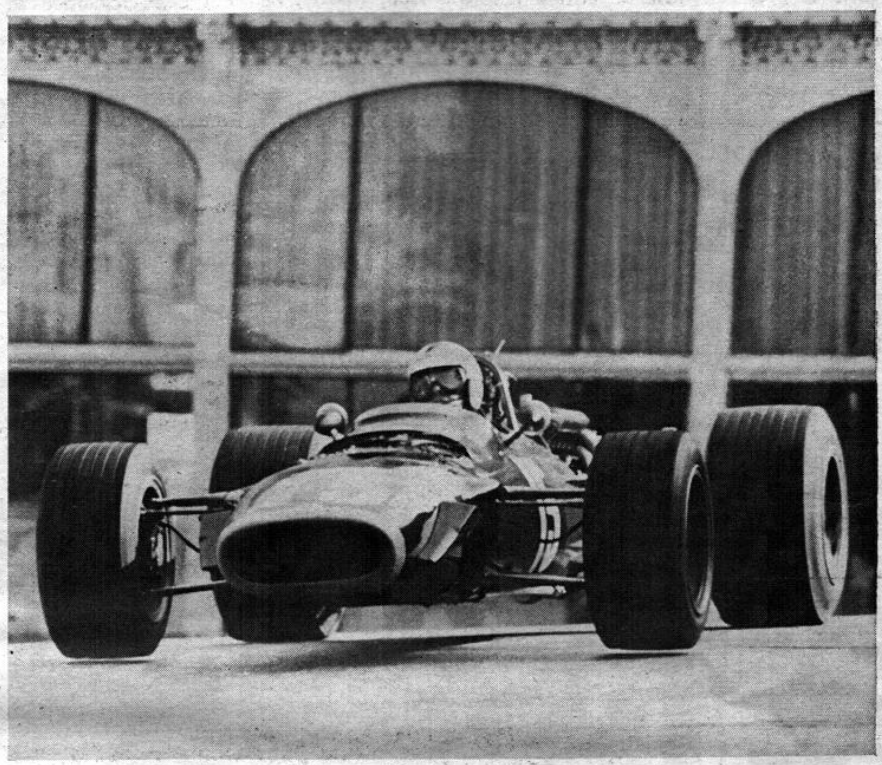
Unfortunately, the engine reliability factor could not be tested during the race, because Beltoise, after settling down into what looked like a lonely sixth place, was one of the select bunch of drivers who tested the resilience, or lack of it, of the metal barriers lining much of the circuit. The impact fractured the right front wheel, punctured the tire, and severely bent the top link. A disconsolate Beltoise cruised slowly to the pits after completing only 11 laps.

France certainly seems to be breeding a lot of driving talent these days. With Jackie Stewart still out of action because of a hairline fracture of the right wrist, Ken Tyrrell went shopping for another replacement driver for his Ford-engined Matra MS10, which Beltoise had driven in Spain. Tyrrell had long thought that Matra Sports might have been wrong in dropping Johnny Servoz-Gavin from its Formula 2 team last year, so he decided to give him a try in the MS10 at Monaco. The result was quite staggering, particularly to those who had forgotten Servoz-Gavin's performance during practice for last year's race, when he drove a ballasted F2 Matra and qualified it.

Since Jim Clark set the lap record at 1:29.5 last year, the Monaco circuit has been slowed by an estimated second-a-lap by moving the chicane nearly 100 yards closer to the Tabac Corner. It has also been tightened to reduce the maximum speed of entry and exit from just over 90 mph to barely 70 mph. Despite this, Servoz-Gavin was timed at 1:31.1 during his first training session with the car (his only previous experience with a real F1 car had been some private testing of the V-12 Matra on the Bugatti circuit at Le Mans). On the second day he was down to 1:28.8, second only to Hill, and good enough for a front-row grid position. Then, in the wet final practice, he amazed everyone, and alarmed many, by powering the Matra-Ford around the puddle-filled circuit a good five seconds faster than anyone else cared to do at that time.

At first there was some doubt whether his fast time would count, because it was made in the training car. But since the team elected to use this car in the race (it was the one Stewart had driven in the Race of Champions, not the lap record-setter of the Spanish GP), the time was allowed to stay. This might well have been the blond Frenchman's undoing, because it enabled him to take the lead at the start and, with no one to pace him, he was soon pulling away from Hill at an astonishing rate. His lap times, on paper, were not sensational (his first flying lap was in 1:34), but the circuit was incredibly slippery for the first few laps, due mainly to dust, and Hill was content to hold back and let what he considered to be the inevitable happen. He only had to wait four laps. Servoz-Gavin became all crossed-up at the chicane, hit the guard rail hard, and limped in with a broken left-rear top-link and driveshaft. Nevertheless, though short of F1 experience, Servoz-Gavin did enough at Monaco to prove that he has outstanding talent. If his enthusiasm to prove himself can be curbed, he will become a great driver.





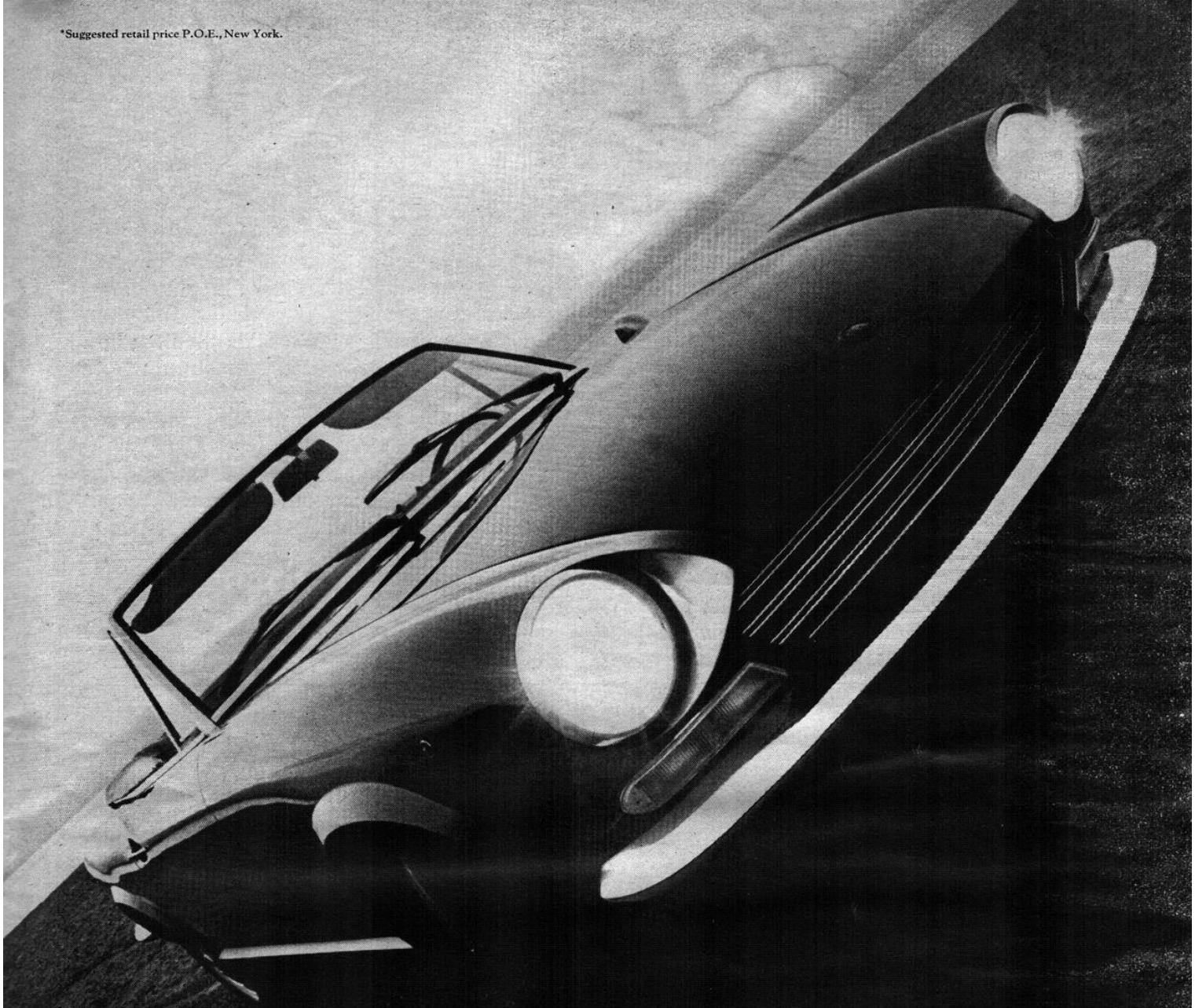
Graham Hill in his fantastic flying-machine, the winning, wedge-shaped-and-winged Lotus 49B, above. Richard Attwood, below, did some flying of his own in the new BRM for a lap record and an impressive second place.

Another newcomer to F1 racing – and to the Monaco circuit – was Britain's Jackie Oliver, who has been a Gold Leaf Team Lotus F2 driver for some time. He was given his first chance to drive an F1 Lotus just a few days before the Monaco race. Using Graham Hill's Spanish GP winning car (the very first Lotus 49), he was determined to keep his nose clean, but adapted himself so well to the circuit and the car that he lapped in 1:31.7 in the very first session. A driveshaft failure prevented him from improving on the time in the second period, and the rain washed out his chances in the third, but he was hoping to learn a lot in the race by cruising around out of harm's way and possibly picking up some manufacturers' championship points for Lotus. But, unfortunately, he only made it as far as the tunnel on the opening lap. There he found chaos and a blocked road in the form of McLaren's M7A, disabled after sliding on some liquid dropped from Siffert's Lotus-Ford and hitting a barrier, and Scarfiotti's Cooper-BRM simultaneously slowing to avoid the car and in trouble with gear selection. There was insufficient room between the two cars, and Oliver just had to hit one of them. It turned out to be the McLaren, the Lotus hitting the only corner which had survived the original contretemps. Oliver's two left-side wheels were all but torn off, and the monocoque was kinked; it was a bitterly disappointed Lotus driver who walked slowly back to the pits, contemplating what might have been "if only" . . .

The McLaren team certainly had their share of problems at Monaco, mainly centered on driveshaft breakage – the legacy of a modification made several weeks earlier which just didn't work out. Hulme's car was locking up front wheels all over the place, but this was mostly due to choosing the wrong tire combination, McLaren's own car being unaffected. Repositioning the fuel injection nozzles had brought some improvement in low-speed pick-up since Jarama, but the team was still trying to find more time when Hulme

Continued on page 68

*Suggested retail price P.O.E., New York.



Match this. $3181.* **FIAT** 124 Spider

You can burn up your intake and exhaust valves before you'll burn up the road.

There are awful things happening in your engine, drivers.

You've seen 'em. Carbonaceous, lead-salt ash deposits.

They lodge on valve seats; they flake off and bridge spark plug electrodes; they fall all over your pistons and cylinder heads.

And if you're driving a '67 or '68, and driving it hard, your car's valves are building up these messy deposits faster than ever.

All this is building up your cost of driving faster than ever, too.

Texaco's made a new Sky Chief gasoline that can drive down the cost of driving by minimizing deposit formation on new valves and arresting further deposit build-up on old valves. Better than any other leading gasoline you can buy.

We don't have to tell you what this can mean in terms of compression pressure, idling, acceleration, mileage—and repairs.

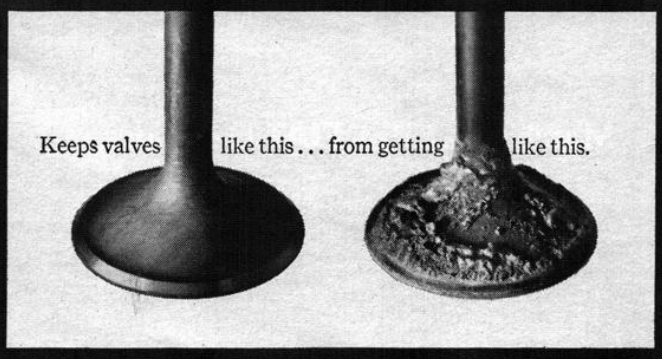
We will tell you this: Over the long haul, new Sky Chief can save you a pile.

Driving down the cost of driving is one reason Texaco sells more gasoline than anybody else.

We're first . . . and we think that's a big responsibility.

Especially to guys like you.

TEXACO



Texaco's new Sky Chief Gasoline. It can drive down the cost of high-performance driving.

Driving isn't bad for it.

As a rule, cars that look as good as the Volvo 1800S don't work as well as the Volvo 1800S.

The thing that makes them not work is driving.

Driving a sleek sports car usually gets it all out of whack. The delicate, sensitive mechanisms that make a sports car go, are the very things that turn around and make it stop.

The Volvo 1800S, on the other hand, doesn't have any delicate, sensitive mechanisms to break all the time.

On the outside it looks like a sports car. But on the inside it's built like a truck.

As Sports Car Graphic Magazine says: "...the Volvo B-18 engine is one of the most, if not THE most reliable, rugged and unbreakable car engines being built today."

And Road & Track Magazine says: "In the car's various mechanical elements there is considerable evidence of the 'strength above all' design philosophy."

Now just because it's built like a truck, don't get the idea it performs like one. The Volvo 1800S has won two SCCA national racing championships in the F-Production category.

Which leads us to conclude that the Volvo 1800S is either the world's fastest, prettiest truck, or the world's toughest, most reliable sports car.

You can drive either one, without being driven to the poorhouse.

VOLVO

The Sad Saab Story!

Someone's got to be kidding – for the money, the Sonett V-4 just doesn't have it!

Photos/Pat Brollier

WE KNOW YOU'VE HEARD POLACK JOKES OR ITALIAN JOKES, BUT HAVE YOU EVER HEARD A SWEDISH JOKE? Well, here's one – Saab Sonett!

Just take a look at the one we have pictured. Would you want to own that for $3695? In addition to its grotesque features, it's noisy and uncomfortable. You might be able to cope with these deficiencies if it were a $2000 vehicle, but not for $3695.

The Sonett V-4 is Saab's only sports car. It was introduced a couple of years ago with a two-stroke engine – the four-stroke Ford V-4 is new. Since its inception, sales in the United States have been almost nonexistent. Nobody wants it, and we can't blame them, either.

Despite its deficiencies, the Sonett has some nice characteristics to it: a built-in roll bar, leather-trimmed steering wheel, carpeted luggage compartment, and, probably its best attribute, front-wheel drive.

Saab has long been an exponent of front-wheel drive, claiming it's the *only* way to drive on ice and snow – and there's plenty of that in Sweden. Saab refers to "keeping the horse before cart – a rule violated by manufacturers of rear-drive autos."

When the Mini-Cooper began its phasing out period this year (it's no longer being imported into the United States), this left the market open for another front-drive vehicle. And that *other* vehicle might have been the Sonett, if the price had been right.

Another area in which Saab prides itself is aerodynamic design, because the company is a large producer of supersonic aircraft. Granted there are good aerodynamic features in the Sonett, particularly in the leading edge of the nose, which directs almost equal amounts of air over and under the vehicle to maintain stability. However, the original design probably was more slippery, because the engine bubble on the hood and the tacked-on ducting do nothing but create unneeded turbulence.

The Sonett is basically a Type 96 sedan, with a different body configuration and a shortened, altered chassis. The running gear of the Sonett, called the Type 97, is the same as the sedan. The Sonett body, however, is fiberglass instead of steel, which knocks off almost 300 pounds of weight.

The 60-degree, V-4 engine is one Saab began using last year. It's a German-developed power plant for the Ford Taunus. You can't expect a heck of a lot of performance with 1498 cc, but it's not that bad for 73 horsepower. Total performance of the Sonett is based on the front-drive concept, which helps it get through corners a lot quicker. In fact, while chasing an Iso Rivolta around Lime Rock, Saab representative Tim Clarke was able to stay with the more powerful car, simply because of the better braking and faster cornering ability of the Sonett, even though the 300-horsepower Iso built big leads on the straightaways.

One thing you can expect out of the Sonett is durability, which is a trademark of Saab. Its very practical, roomy, and comfortable sedan continues to gain popularity in this country, particularly where the winters are cold and severe.

It doesn't quite seem that the Sonett is as warm and inviting as its sedan cousin. The interior is cold in appearance and makes you feel like you're inside a galvanized washtub. The four-speed column shift is rather awkward to use. If your hand is large, there's the problem of striking the dash during a shift upward to third gear. The directional signal lever happens to be located on the same side (for some ungodly reason), and this also interferes with proper use of the shift lever.

The noisy V-4 engine transfers vibrations to the cockpit and, because the Sonett is a coupe, the sound bounces around inside and becomes quite annoying. In fact, the noise is so loud that you often feel you're overrevving the engine, even though the redline is set at 5200 rpm (we used 6000 in our test).

There is a peculiarity in the design of the car that causes a wind whistle, which can be heard from outside only. It is probably a result of either the rubber bumper guards which protrude from the front or the radiator setup.

A rare feature that appears in all Saab automobiles is free-wheeling, which can be engaged or disengaged manually. With the free-wheeling in operation, you can shift without the clutch and there's no deceleration effect from the engine – it sort of gives one an idea of what it's like to drive a turbine car. It takes more familiarization than usual to get accustomed to free-wheeling. Many like the feature, but we don't. It makes you rely too much on the car's brakes and handling characteristics.

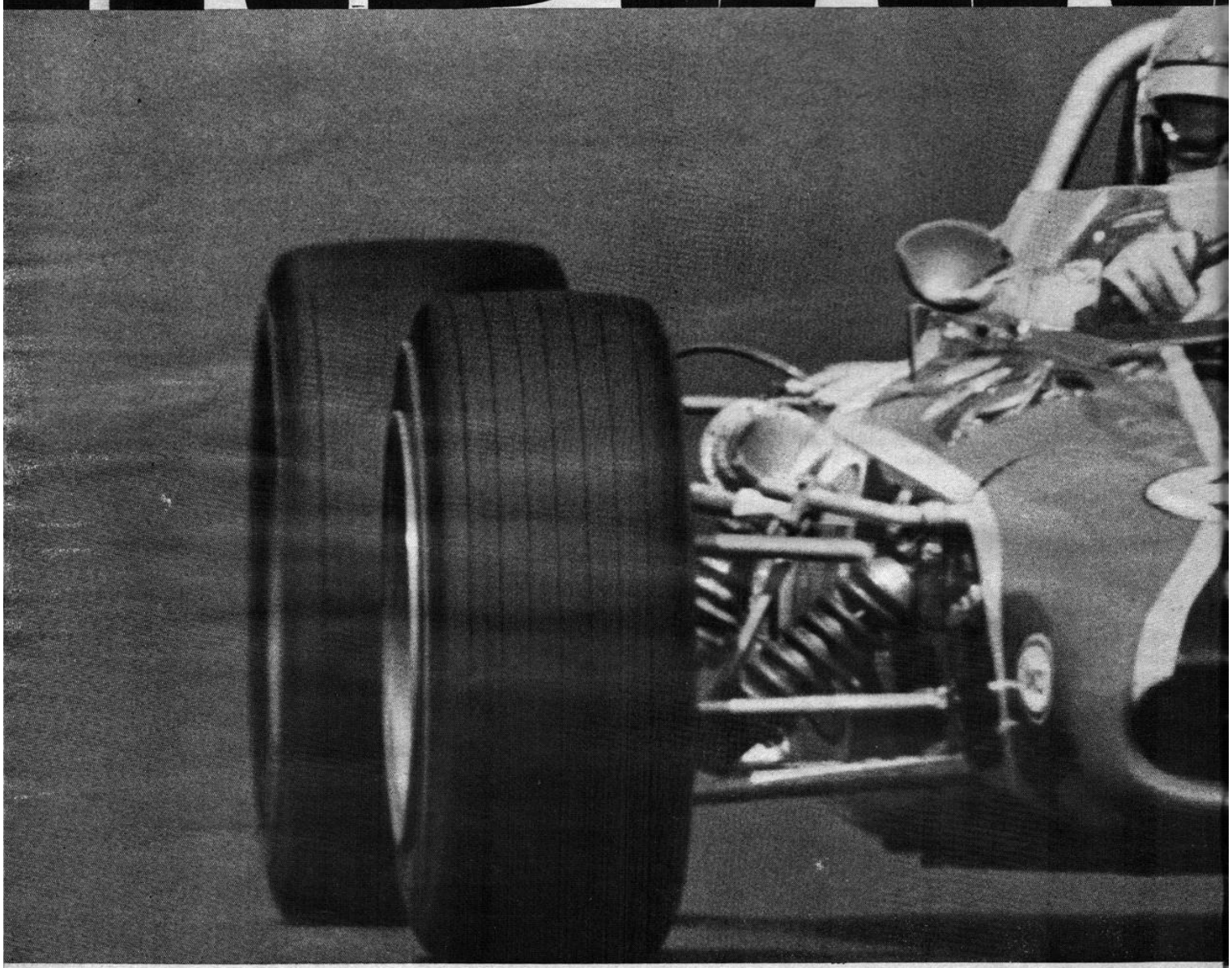
We felt a bit apprehensive about even getting into the Sonett during our test. The interior seemed inhospitable, but we finally plopped down inside, awkwardly angled our lower torso toward the center of the car, and sat fairly comfortably in the firm bucket seats. The roof was quite low and, on occasions, our head

Continued on page 28

There are cars that look worse than Saab's Sonett, right, but most of those are built in backyards across the country. Principles of the Sonett's styling are aerodynamically good, but usually such designs don't sell well unless the public is attracted to the car's overall appearance.


SONETTY4

INDIAN



Bobby Unser wins the

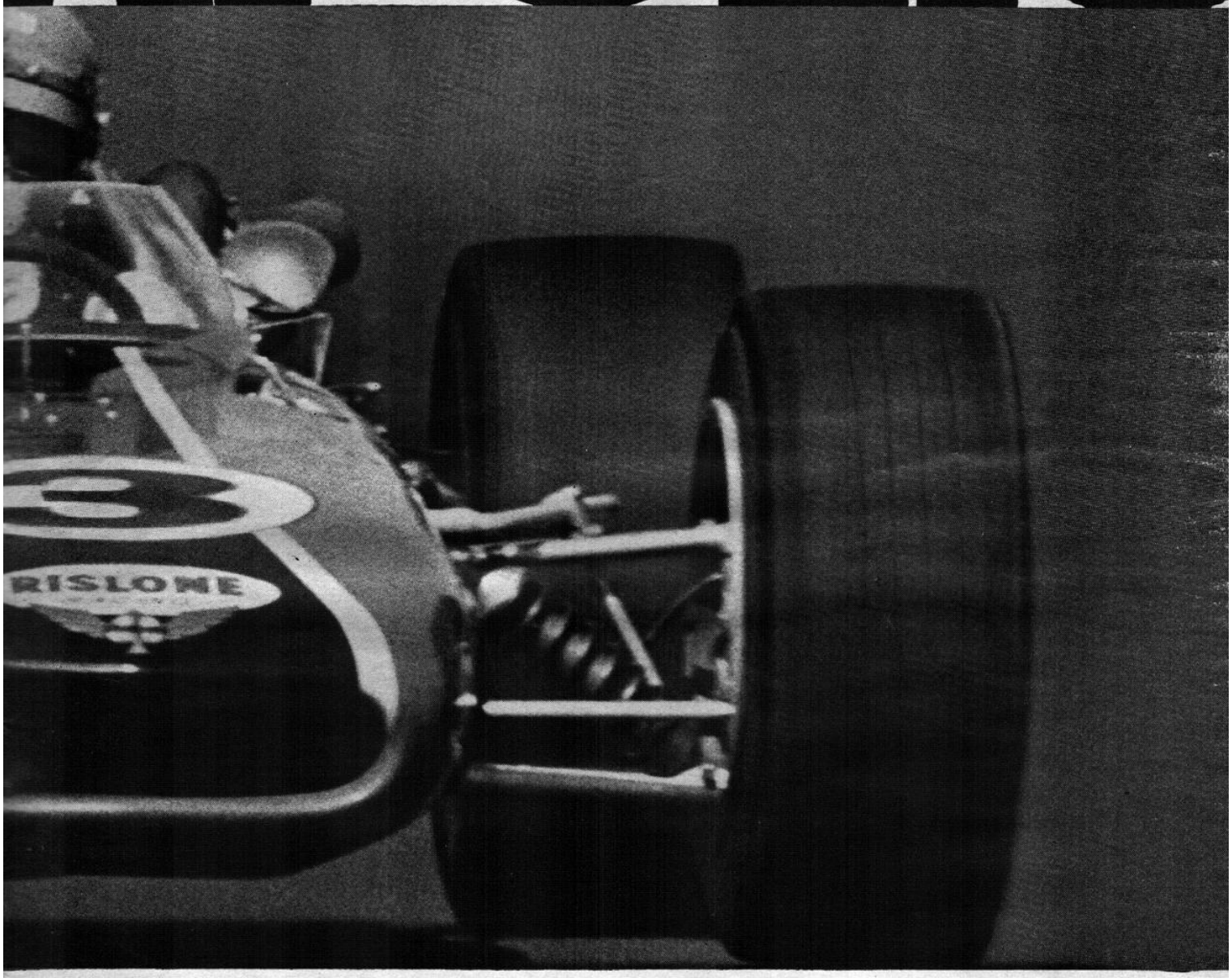
This Memorial Day, the first four cars across the finish line were all on Goodyear tires.

Bobby Unser drove his Eagle-Turbo Offy car to a new Indy speed record of 152.882 m.p.h. He led for 127 of the 200 laps. And his Goodyear tires went the full 500 miles without a single tire change.

Next came Dan Gurney in second place. On Goodyear tires. And Mel Kenyon in third. On Goodyear tires. And Denis Hulme in fourth. On Goodyear tires. Unser, Gurney, Kenyon, Hulme—all, just like last year's winner, on *Goodyear* tires.

You can win, too, with the Goodyear Polyglas Tire. It can give you up to double the mileage.

APOLIS



500 on Goodyear Tires

The revolutionary new Goodyear Custom Wide Tread . . . the Polyglas tire . . . is winning more acclaim than any other tire in history. Why? Simply because it can give you up to double the mileage of today's best selling Goodyear tires.

Double the mileage! Try to beat that. And only Goodyear makes the Polyglas tire. Nobody else.

Winners go Goodyear. Just ask Bobby Unser.

GOODYEAR

Custom Wide Tread, Polyglas—T.M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

SAD SAAB

Continued from page 24

made contact. We never could get really comfortable; it was impossible to stretch out, and every time we went to shift we had to lean forward slightly and struggle for the proper gear. We missed third almost as many times as we made it!

Now that we were inside, our apprehension about driving the car was greater than it had been initially. You really knew this was a lawnmower disguised as an automobile, and knew what it was supposed to do—but would it? Fortunately, it worked as we expected, pulling us safely around the tight turns of Lime Rock Park, even though the gearing left much to be desired.

We were painfully reminded, however, that this was a stiffly sprung car, for the seats smoothed out only portions of the bumps.

When it was all over, we were relieved and also a little sad for Saab. You know that the company wanted to maintain its integrity by producing a low-volume sports car. But the question is: Why this one? There has to be some ulterior reason behind it all. It must be a Swedish joke!

Right, rear deck below window folds down to accommodate luggage. Below, Sonett is one of few to have built-in roll bar.

VEHICLE ..... Saab Sonett V-4

PRICE

As tested ....$3695 (POE N.Y.)
Options ..... None

ENGINE

Type ...V-4, four-stroke, water-cooled, cast-iron block
Head ....Cast-iron, removable
Valves ..Ohv, pushrod-actuated
Max. bhp @ rpm..73 bhp (SAE) @ 5000
Max. torque ..87 lb. ft. @ 2700
Bore ..... 3.54 in. (90 mm)
Stroke .....2.32 in. (58.9 mm)
Displacement .....91.4 cu. in. (1498 cc)
Compression ratio ....9.0 to 1
Induction system..Single 1 bbl. Solex 32 PDSIT-4
Electrical system .....12V, alternator

CLUTCH

Type .....single, dry disc
Diameter .....7.5 in.

TRANSMISSION

Type ....4-speed, full synchro
Ratios: 1st .....16.23 to 1
2nd ..... 9.74 to 1
3rd ..... 6.05 to 1
4th ..... 3.90 to 1

DIFFERENTIAL

Type .....Front-wheel drive transaxle
Ratio 4.67
Drive axles (type) ..Open, two-joint half-shafts

STEERING

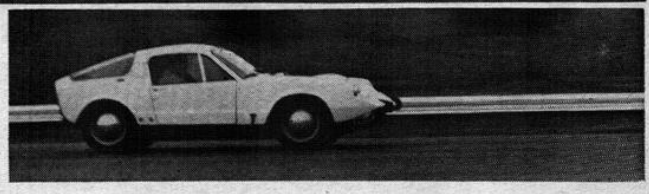
Type .....Rack and pinion
Turns (lock-to-lock) 2¼
Turn circle .....31.5 feet

BRAKES

Type ..Hydraulic, dual system, disc front, drum rear.
Disc dia: Front .....10.5 in.
Drum dia: Rear .....8.0 in.
Swept area .....256.0 sq. in.

CHASSIS

Body .....Fiberglass
Front suspension..Coil springs, tube shocks, unequal length control arms, anti-sway bar
Rear suspension ..coil springs, tube shocks, rigid U-shape tube axle
Tire size .....155 x 15
Tire type .....Pirelli Cinturato



WEIGHTS AND MEASURES

Wheelbase .....85 in.
Front track .....48 in.
Rear track .....48 in.
Overall height .....46 in.
Overall width .....57 in.
Overall length .....149 in.
Ground clearance .....5 in.
Curb weight .....1700 lbs.
Test weight .....2090 lbs.
Gas tank .....15.8 gals.

PERFORMANCE RESULTS

ACCELERATION

0-30 ..... 4.3 sec.
0-40 ..... 7.0 sec.
0-50 ..... 9.8 sec.
0-60 .....14.0 sec.
0-70 .....19.4 sec.
0-80 .....26.6 sec.
Standing quarter-mile 19.5 sec. @ 70 mph
Top speed, mph..95 mph (est.)

FUEL CONSUMPTION

Average .....28 mpg

SPEED RANGES IN GEARS

1st 0-24
2nd 11-41
3rd 17-69
4th 24-top
Rpm redline 5200

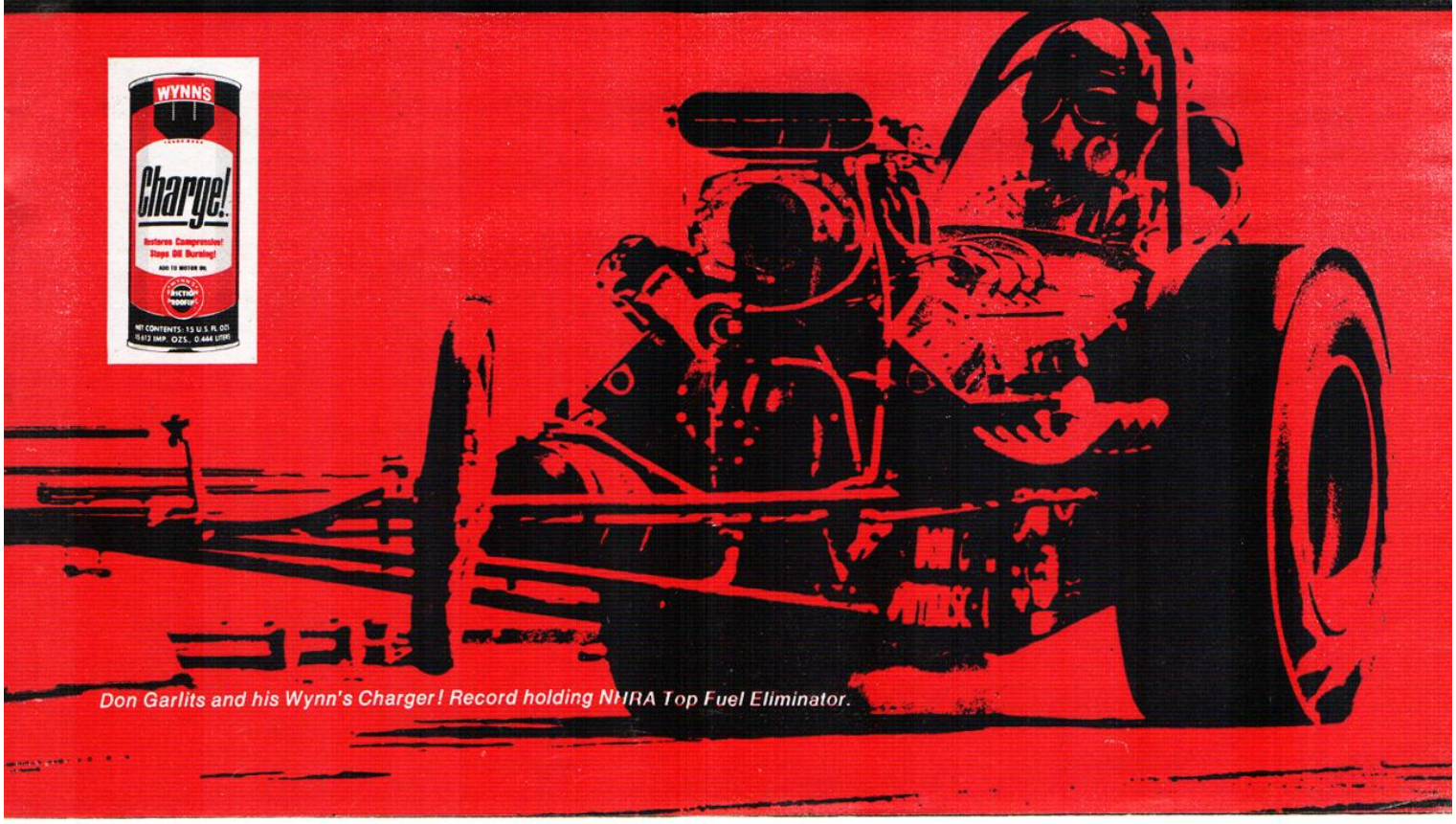
SPEEDOMETER ERROR

Indicated	30	40	50	60	70	80
Actual	26	36	47	57	67	76

All the Wynn's® sponsor money in the world won't make Don Garlits put Charge!® in his dragster unless it works!

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 ¼ mile in record time. If it didn't — it wouldn't be in the crankcase of his Wynn's Charger. Whether you drive a dragster or a family car, isn't it time you used Charge! in your engine?

Get a Wynn's decal for your car and a catalog of Wynn's Racing Specialties. Write Dept. G, Wynn Oil Company, 1151 W. Fifth St., Azusa, California 91702.



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

The Great Escape Car.

MGB/GT

MGB/GT lets you escape the option trap. Read how.

MG doesn't like the option trap any better than you do. Because we realize that you can take an ordinary car and add a lot of expensive options to it. But, basically, you'll still have an ordinary car.

That's why we've come up with a different concept in the MGB/GT. Everything that makes it an authentic high-performance GT is included in the $3,180.* price tag.

Included is a race-proven 1798 cc engine with dual carbs. An oil cooler for longer engine life. And, to let you know what's doing under the hood, full sports car instrumentation including a tach red-lined at 6000 rpm.

Also included is a fully synchronized 4-speed gear-box. Big, fade-free disc brakes. And, of course, road-hugging suspension backed by over 40 years of racing experience.

Plus extra touches that set the MGB/GT apart from ordinary cars. Example: adjustable English leather bucket seats. Example: 60-spoke wire wheels. Example: carpeted luggage space.

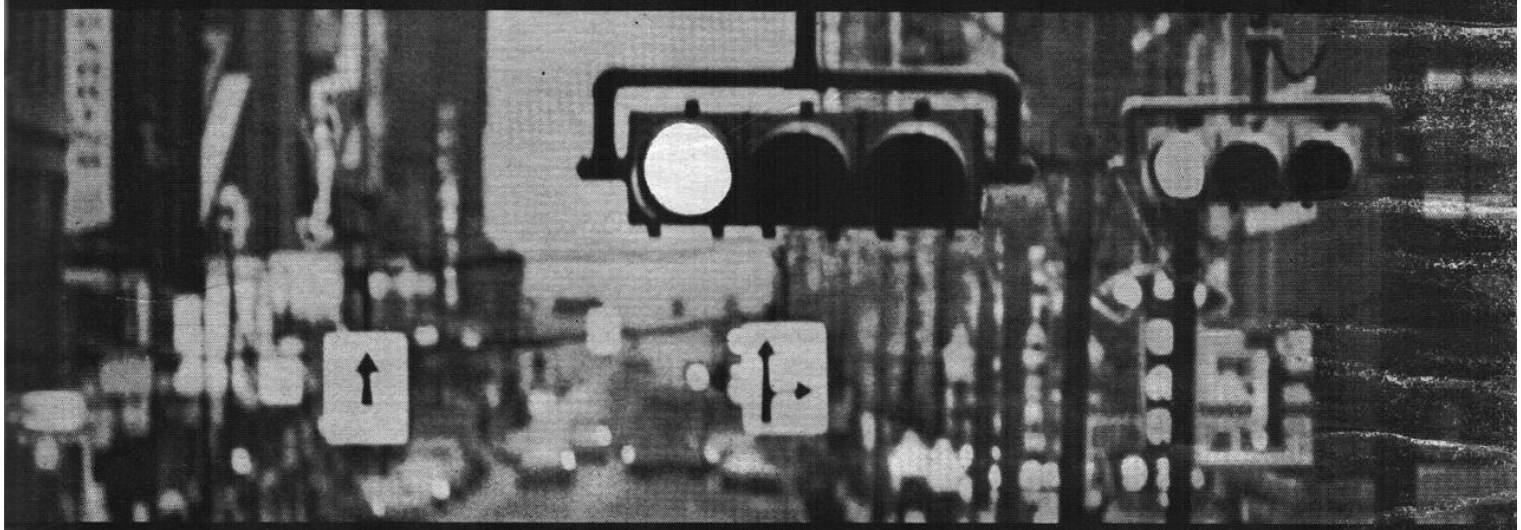
So why pay extra for extras? Get the MGB/GT with everything included for a realistic $3,180.

A great escape from the option trap.

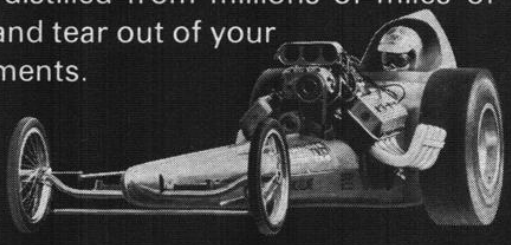
MG AUSTIN HEALEY

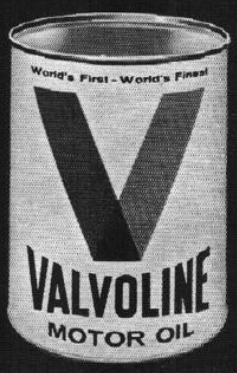
*Suggested retail price P.O.E. New York. For overseas delivery and other information write: Dept. C-43, British Motor Holdings (U.S.A.), Inc., 734 Grand Ave., Ridgefield, N.J. 07657.

The Stop-Start Torture Test



Continual braking and accelerating can be tough on your car's engine. With moments of stress equalled only in competitive racing. Moments that cause excessive engine wear. That's why your car needs the full-time extra protection built into Valvoline—the motor oil that's race proved to meet the rigors of everyday driving. Every can of Valvoline contains the power, performance, and protection know-how distilled from millions of miles of racing. Take the wear and tear out of your engine's toughest moments.
Ask for Valvoline.



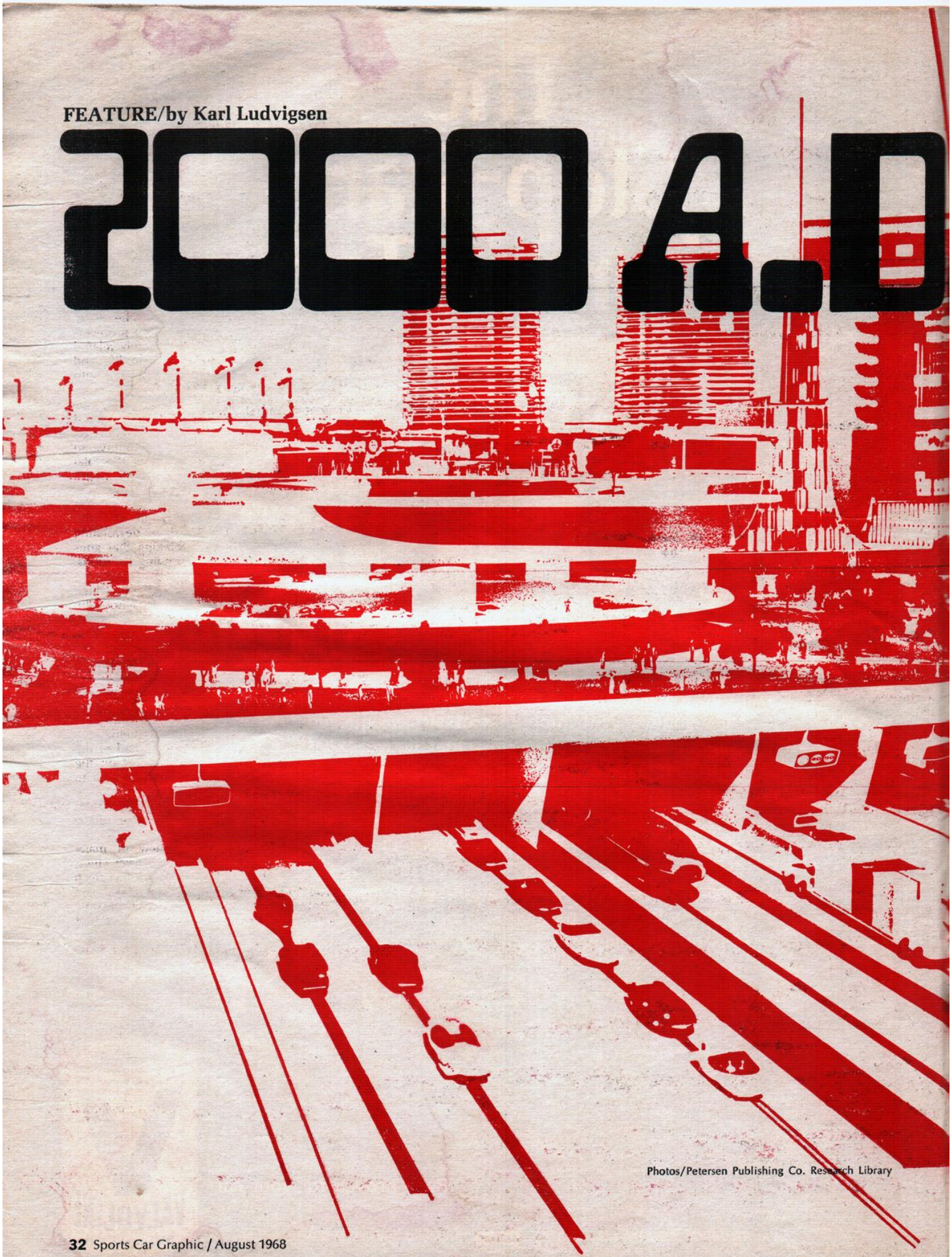


Race proved for your car

VALVOLINE OIL COMPANY, Ashland, Ky. Ashland Division of Ashland Oil & Refining Company

FEATURE/by Karl Ludvigsen

2000 A.D



Photos/Petersen Publishing Co. Research Library

A look into the future... and a prediction of what cars will be like a third of a century from now

'In the year 2000 the citizens in our new cities will either still be complaining about urban transportation problems, or they will point with pride to the transportation solutions that eliminated the old-fashioned urban syndrome.'

– Foster L. Weldon
Ford Scientific Research

STANLEY KUBRICK'S EPIC FILM, '2001', IS A STAGGERING ACHIEVEMENT. It shows in stupefying detail what men might be wearing, doing, saying and seeing at the outer fringes of our vastly expanded technology. But '2001' starts above the earth's surface. It does not, or perhaps dared not, attempt to show what the traffic was like on the way to the launching pad.

Nor has anyone else attempted to do so. Planning groups, galvanized into an appearance, at least, of activity by the approaching millennium, are issuing sweeping projections and predictions about our existence 32 years from now. There will be 330 million Americans then, we are told, 280 million of whom will be living in urban areas – just double the urban population of today. The planners expect there will be a quintupling of the world's energy production to meet the needs of a global population double its present size.

To try to anticipate what they consider to be public demand, statisticians for every industry have projected graphs and curves to the year 2000 and beyond, deluging us with data on income, densities, family patterns, the number of rotisseries per household, and a chorus or two of 'There's a great big beautiful tomorrow.' Projections of quantities are not lacking. But, as Joseph Wood Krutch observed (our italics), 'The *quality* of life – that is precisely what seems to be almost entirely left out of consideration in many prophecies.'

Seers agree that in one way or another, we will have transportation in 2000, but they will hazard no guesses about its beauty, its tranquillity, its privacy – its quality. As *Time* magazine noted in one of its essays, 'None of the forecasters seem to have any good solution for the traffic problem, though they count on automated, and possibly underground, highways.' That's all they had to say about personal mobility – the driving desire of man that has created our largest industries of today and given man his greatest freedom. And in the best development of personal mobility lies civilization's main hope for an improvement in the quality of life. For in its deterioration would lie only chaos.

Some serious studies have been made of what to expect in the way of wheeled transportation toward the end of this century. One of the most under-rated exhibits at the under-rated New York World's Fair of 1964-65 was the Futurama ride of General Motors. Behind its 'gee whiz' materialism lay a wealth of study and knowledge of future transportation modes. A couple of years newer is the 'Metrotran 2000' study by the Transportation Research Department of the Cornell Aeronautical Laboratories. Cornell took today's vehicle-use trends and projected them forward, showing, for example, that in year 2000 there will be 4.2 times the number of intercity trips that take place today.

Cornell further concluded that we will need triple today's lane-miles of expressways by 2000 to handle the traffic – if we rely on cars alone to get the job done. Cornell and the current Detroit Area Transportation and Land Use Study agreed that, by 2000, other forms of transit will compete more effectively with automobiles in getting people in and out of cities. While cars carry two-thirds of the commuters today, they may account for only one-third of the many more urban commuters in 2000.

Several top-level urban planning studies are generating data like this, extrapolating past and present actions and desires into the future. But none takes into account a vast revolution now in its first stages of ferment, one that will offer the greatest alternative – hence competition – to personal mobility: communications. By year 2000, the need for travel to see someone simply to talk to him, for personal or business reasons, will no longer exist. His three-dimensional, real-time image will materialize in the home communications chamber in such a lifelike manner that a completely normal conversation will be possible. Groups, documents, physical objects will present no difficulties to the incredible communications media we'll control in 2000.

This is not science-fiction speculation. Communications, still a lusty baby today, is growing rapidly and is expected to pass the transportation industry in gross business volume by 1977. Don Fabun of Kaiser Aluminum theorized that before 2000, the communications industry will so successfully recreate reality that 'the human sensory apparatus will no longer easily be able to distinguish between an electronically created experience and an in-person one... gradually the wheel will be traded in on the electron.'

This very competition, however, could prove to be one of the sharpest spurs to progress in the automotive industry. Prophets of its demise overlook the vital role of the truck and its future descendants in urban life. What else, for example, would be used to deliver the communications devices to the home or office? But, there is no denying that the transportation industry is hampered by its very hugeness in any attempt to make plans to move forward, especially along entirely new lines.

There's no lack of physical or mental equipment. 'In the transportation world we do have plenty of "space age" technology,' points out Foster Weldon of Ford, 'but we *don't* have a well-defined "moon" to aim at and land on. The urban goals toward which our technology might be directed are still diffuse and ill-defined, and there is no coherent program for their attainment.' Even when the goals are clear, the development lead time must be long. Solutions to major transportation problems tend to be complex and intimately related with the preservation of human life and limb. They cannot safely be rushed into being.

Whether it likes it or not, the transportation Establishment is so gigantic that it has a powerful built-in resistance to change. Highway and automotive expenditures in 1965 accounted for one-tenth of the total U.S. gross national product. Thus, there's a substantial investment in the status quo. Nor are the cities' problems any simpler than those of the industry. In *McCall's*, Thomas Hoving provided a devastating glimpse of the kind of thinking that goes into New York's major planning decisions. Some samples:

'Lack of leadership and vision, which I found in New York Ctiy throughout the entire system.

'The underlying thought that mediocrity is not only okay, but is preferred.

'Total lack of willingness to take a chance on anything.

'Low or no standards for quality or excellence.

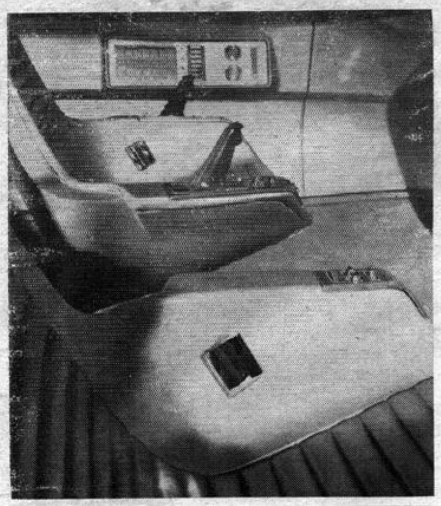
'Lack of appreciation and willingness to recognize creativity in any field.

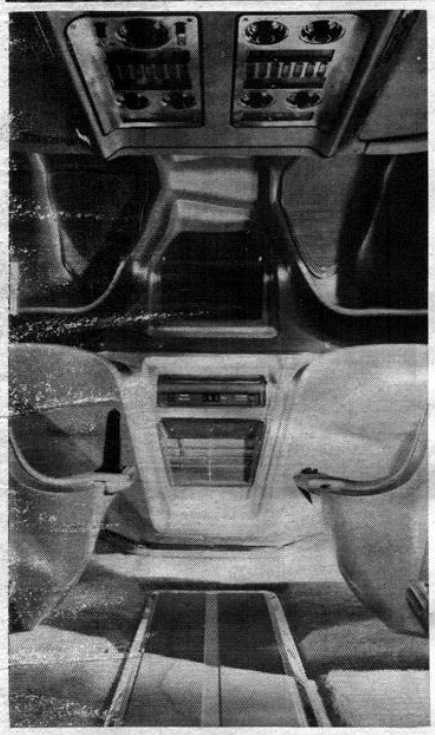
'Not only an apathy on the part of the citizenry, but a concerted effort on the part of the people in city government to encourage apathy.

'An unwarranted awe and respect for all traditions and rules that are totally outmoded and stupid.'

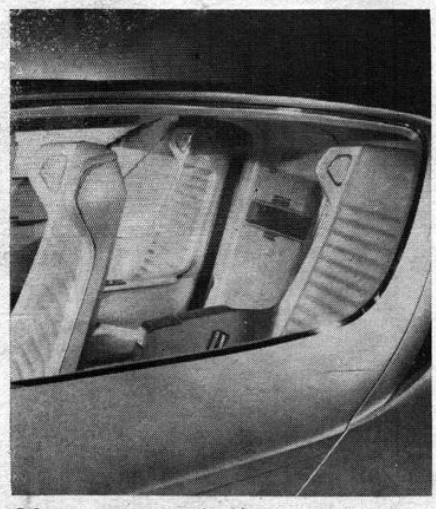
Is there hope? In the view of many futurists, of course there is. In today's cities, Hoving says, 'political consideration is given the total top billing.' But by 2000, says Buckminster Fuller, 'politics will become obsolete.' Fuller believes it will be swept aside by the power of a new scientific ideology, riding the crest of a wave of spectacular advance. 'What will go on (before 2000),' Fuller is certain, 'will be more of a change than has occurred in the whole history of man on earth.' Before us lies a third of a century of discoveries so incredible that we cannot even guess at them now. In fact, the only thing that we *can* know for certain about these years is that there *will* be fantastic achievements by man which will entirely change his way of life.

Let us assume, then, that the force of change will be sufficient to overcome the inertia of the automotive establishment. What means will the industry use to try new ideas, to test their effectiveness and acceptance without making the colossal commitment of mass production? One approach, Ford's Roy Lunn points out, is racing. 'It's a very useful bridge to the road





Although probably conservative with reference to the year 2000, the interior of the GM Firebird IV gives a hint of what the future all-electronic turbine-powered car might be like.



2000 A.D.

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car. That's one reason why we chose to go GT racing instead of Grand Prix. In spite of what we and others have said about them, the GT rules have over the years stimulated a lot of progress in cars.'

As an example, Lunn cited the Mark IV Ford and its radical adhesive-bonded honeycomb construction. With wins at Sebring and Le Mans, it demonstrated clearly that glue could be relied upon as a way to hold an automobile together. Without racing this proof would not be available, and adhesives, which are sure to play a part in future car construction, might be many years away.

Roy Lunn also indicated that small, integrated design groups like Ford's Kar Kraft, which he heads, can bring totally new kinds of cars from brainstorm to reality far more easily and effectively than the larger engineering groups, which are preoccupied with production design. In the future, auto companies will rely more and more on small, talented teams with the equipment to build and try their theoretical cars. Such groups help develop and train the fully rounded engineering men, who will have the vision and training to design and build cars which are part of the real world, not mere extravagant ends in themselves.

Also essential to automotive evolution is the small-volume production series. To Detroit today, this means cars like the Corvette and the Continental Mark III, which are specialized enough and expensive enough to allow them to use radically new materials and design elements without major economic risk. More and more proliferation of makes and models from the U.S. factories will accelerate this process of advancement through natural selection.

There is other small-volume production which can be meaningful to the major auto makers. Some of it is overseas, but, frankly, little of that is genuinely new and stimulating. Much more provocative is the production of super-specialized vehicles like snowmobiles, go-karts, auto bodies and kits, golf karts, two-wheelers, and amphibious and rough-terrain vehicles – not to mention advanced military machines. All of these build new technical ability and probe new extremes of public interest and acceptance. From them will certainly come new kinds of serious transportation devices; through them, the automakers can keep abreast of potential changes in the industry.

Vast progress can and will be made, and the industry has tools with which to do it. But how is the challenge to be defined? Who will form the question so that an answer may be sought? It will almost certainly have to be the Federal Government. One Washington spokesman provided the following definition of the circumstances which indicate a need for a Federal research and development effort:

'Government initiative is generally needed when great uncertainty exists as to the results of research projects; the magnitude of the project exceeds industry's capabiltiy and resources; the prospect for returns is far off in time; the probable returns are widely dispersed throughout society; and the welfare of future generations is involved.' There could scarcely be a better summary of the present dilemma of the personal transportation establishment.

Thus, we look trustingly – but at this point, without optimism – to Washington for the research-and-development initiative that will help guide the transportation industry's own researchers toward 2000. Can we theorize at all accurately about what they'll find when they get there? Of course we can, each of us in his own direction. Joseph Wood Krutch in *Saturday Review* stopped trying to pick one path that was better than the others: 'There are so many conflicting forces making for so many possibilities that there are a dozen possible futures, no one of which seems certain enough to justify saying, "This is what it is going to be like".'

Viewing the future as a whole, Krutch is refreshingly right. But, in the automotive field we can make certain assumptions about a kind of car which will come into being. It may be the car of 2000 or, more likely, it may be the car of a decade or more earlier. Anything which man can imagine today, cannot lie too many years in the future.

There will still be a family car, and by that we mean an enclosed vehicle that can comfortably carry four to five people. Not all families will have one; rare indeed will be those that will have two. In two-car families, the second car will actually be owned by the breadwinner's employer, a current trend that will undoubtedly be expanded in the future.

Will such cars run on wheels? Yes, they almost certainly will, and wheels not arranged much differently from those of today. But there will no longer be a separate tire and wheel. Both functions will be performed by a single, molded-plastic part with a rigid center for attachment to the car, and with molded-in supporting foam that's blowout-proof. Even the need for a central hub attachment for the wheel could vanish with the conception of a roller drive system above the wheel, or a wheel with cast-in metallic elements making it the rotor of an electric drive motor.

The power unit will be a gas turbine. The description must be that specific, because the turbine is the only engine we know of today that will burn liquid petroleum fuel in a pollution-free manner, that can be made very quiet and smooth, and that by year 2000 could be developed to produce 1000 or more horsepower in a package so small that its location in the car will not be important. In 32 years, a competitive engine to do this job may have been developed; right now we'll have to say 'gas turbine.'

Vast engineering and production expenditures will go into these compact and powerful turbines. The outlay will be such that General Motors will make only two types, one producing 750 brake horsepower and the other 1200 bhp, for its entire range of cars. Ford will make only the large one, Chrysler only the small one, and they will buy from each other. This will be socially permissible because, in 2000, the power plant of a car will carry far less emotional significance – to both builder and buyer – than it does today.

We can see the beginnings of this trend today, as auto builders standardize engines more and more and as federal anti-pollution requirements start to turn them into

Opel Rallye Kadett. Manufacturer's suggested retail price: $2325.26, includes Federal Excise Tax, suggested dealer delivery and handling charge. Transportation charges, accessories, optional equipment (chrome wheels on model shown below $62.30 additional), state and local taxes additional.

The Mini-Brute loses.

Even the toughest economy import ever to cross an ocean will lose some contests.

Not many. The rallye stripes on this new Opel Rallye Kadett are for more than show.

A good look under the sheet metal will prove it.

Look at the standard equipment: An 80 horsepower (1500 c.c.) cam-in-head engine (equipped with an alternator instead of a generator). Available: a 102 (1900 c.c.) cam-in-head version. Special ratio 4-speed console-mounted transmission. New heavy-duty clutch, drive line and rear axle. Power-assisted front disc brakes. New, stronger front suspension and steering. A completely new rear suspension with coil springs—three link and track bar design. Roller bearings for all four wheels.

And then there are the obvious good things. Radial-ply tires. Simulated wood three-spoke steering wheel. Special console mounted instrument cluster, including oil pressure and ampere gauges and electric clock. 0.1 mile odometer. Tack. Fog lamps. Comfortable front bucket seats.

You can see the special paint and wheels in the picture. And you can find out more about the Rallye Kadett and five other Mini-Brute models at your nearest Buick-Opel dealer.

Here are some of the contests Opel Kadetts haven't lost. Win records in some of the world's most punishing car contests—over all types of roads and through all kinds of driving conditions—these rallies are severe tests of a car's durability. And Opel Kadetts outlasted all other cars in their class.

Rallye Monte Carlo
January 11-22, 1967
1st in class—Lambart

Rallye dei Fiori
February 22-26, 1967
1st in class—Beck/Heuser
2nd in class—Lambart/Vogt

Tour d'Europe
September 1-10, 1966
1st in class—Beck
2nd in class—Lambart

Tour d'Europe
September 4-16, 1967
1st in class—Falkenberg/Maarfeld
2nd in class—Arend/Spork

Buick's New Opel Kadett.

2000 A.D.

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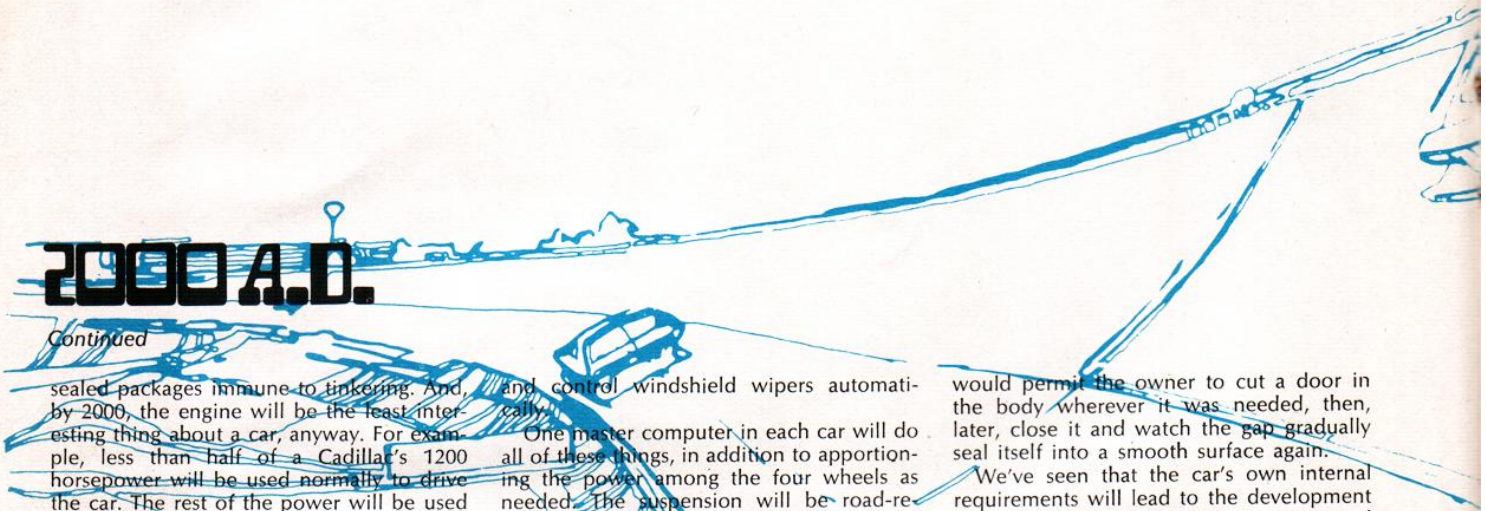


sealed packages immune to tinkering. And, by 2000, the engine will be the least interesting thing about a car, anyway. For example, less than half of a Cadillac's 1200 horsepower will be used normally to drive the car. The rest of the power will be used for the car's many other fascinating functions.

Car design will also take into account the future fate of the machine and its parts. It may well be that these turbines will be built to outlive several chassis/body structures, and will be reclaimed for future use by the maker. When you get a new car it might have either a new engine or a completely rebuilt one; to you it would make no difference, because the warranty and the life would be identical. The process would be an acknowledgement of Buckminster Fuller's observation that 'the world's total mined metals resources recirculate every twenty-two-and-one-half years.' We don't use metals up; we just reuse them. And, in the future, we will design to make such reuse easier.

The connection between the turbine and the wheels will be electrical, based on a far more sophisticated version of the generator/motor relationship, with electronic controls. Braking will be accomplished by a reversal of the system. Abandoned will be the barbaric practice of throwing away hard-won energy in the form of wasted heat from the brakes.

Electronic controls will also monitor the braking. In fact, all of the important functions of the car of the future will be electronically assessed and operated, under the guidance of a single central computer. We are already starting to evolve toward this today, with the introduction of simple but genuine computers controlling fuel injection, ignition timing, constant-temperature cooling/heating systems, and anti-skid braking. Other applications are around the corner, too. Roy Lunn revealed that Ford had considered the use of an aircraft-type steering stabilizer to let electronics help the driver control a 220-mph GT car on the Mulsanne Straight at Le Mans. Simple computers are also available to dim headlights and control windshield wipers automatically.

One master computer in each car will do all of these things, in addition to apportioning the power among the four wheels as needed. The suspension will be road-responsive, under electronic control. The computer will adjust the interior equipment of the car, the seats, controls, and conveniences, automatically in response to the occupant's movement. Entirely new functions of trip programming, guidance, and communications will be available, foreshadowed most accurately today by GM's Driver Information and Routing System.

What servos will the computer signal to carry out these functions? By 2000, our cumbersome hydraulics and electrics will be replaced by artificial muscles — man-made fibrous bundles which react chemically to electrical inputs, expanding and contracting on command. These will be shaped as cords, rings, flat surfaces, spheres, or any other shape needed to do a specific job. In some cases (seat backs or window shades, for example), the actuator and the actuated may be combined in the same self-powered membrane.

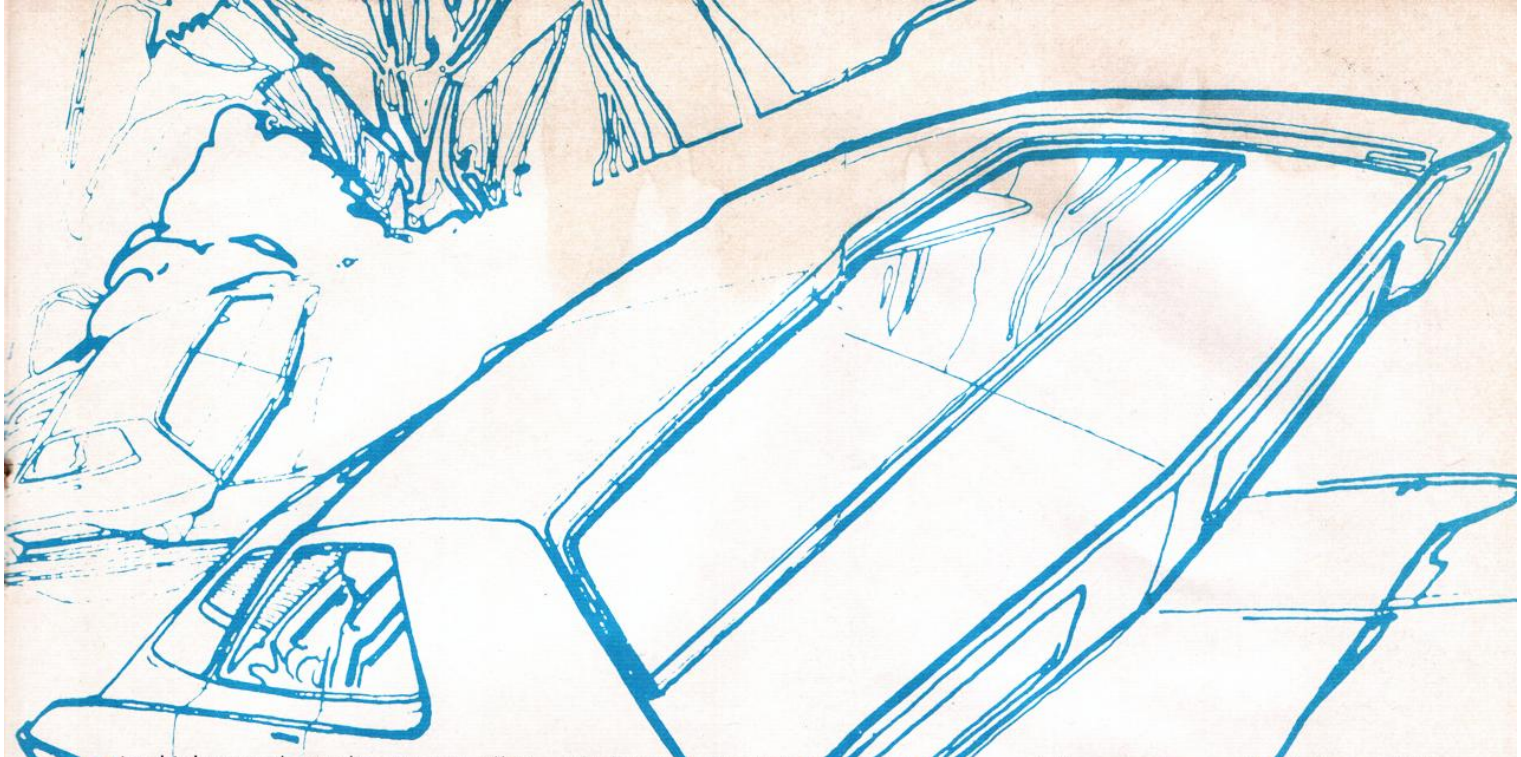
Metals will still be relied upon in 2000 for the most highly stressed parts of the automobile, such as the central structure and the main power generator. But plastics will certainly be used for the low-stressed components, for the body and most of the interior. In its capacity for warmth and variety, plastics will bring new visual and tactile delights to automotive interiors, which will be so integrated and sculptural that there no longer will be separately identifiable seats, floor, dash, door panels — the stereotyped furniture of our present cars.

Plastic's lightness, flexibility, and adaptability will permit car designs that allow us to make major changes in space and structure to carry out different tasks. There will be fewer multi-car families, because it will be possible to transform one basic vehicle into many different shapes to do a variety of jobs. Indeed, a plastic with self-healing properties is a likely discovery, one that would permit the owner to cut a door in the body wherever it was needed, then, later, close it and watch the gap gradually seal itself into a smooth surface again.

We've seen that the car's own internal requirements will lead to the development of a central computer with its associated nervous system. This effectively answers the old question, 'Which will come first: The automatic highways or the cars to run on them?' The cars will come first, and by 2000 there will be several arteries on which they'll be cruising automatically at speeds up to 120 miles per hour. One such electronic highway will be in operation from Boston through Washington in the supercity of the east, known as 'Boswash.' Portions of the southern end along the east coast of Florida will be complete, and plans will be under way for the completion of the entire east-coast road. Its west coast equivalent will be in use throughout 'Sansan,' the giant city stretching from San Diego to San Francisco, while construction is advancing on its northern extension. The east-west road will not be finished, but a major part of it — that from Chicago to Philadelphia through the midwestern 'Chipitts' city complex — will be in use by 2000.

In the construction of these highways, there will be a new awareness of the fact that the surrounding countryside needn't be sacrificed to provide a 'nice view' for the car travelers. Roads will be designed more as part of a transportation system, with high functionalism, and less as grassy boulevards with a bucolic blandness more appropriate to the horse-and-buggy era. Travelers on advanced or automatic highways will alternate between having little or no view, then being occupied by the driving task or by on-board entertainment media, and watching staggering visual spectacles as the road vaults a mountain chasm or crosses a lake bottom through a transparent tunnel.

There will not be unlimited numbers of these family automobiles in 2000. As noted before, not so many will be needed per family unit. This may come about through natural evolution, or a period of automo-



tive birth control may be put into effect around 1985. Not so many cars will be needed because, on the one hand, there will be better mass transit, and on the other, better individual transport. Of course, with new urban designs, pedestrianism will be rediscovered as a positive pleasure. In summer or winter we'll travel coatless from home to work and back again in a weather-controlled 'shirtsleeve environment.' In our new multi-dimensional cities, horizontal shuttles will complement vertical elevators in moving people about at both high and low levels.

Between the multi-passenger car and pure foot power, we'll have developed an individual mobility device by 2000 that will scoot us personally wherever we want to go. Its total range may be no more than 100 miles, and its speed no more than 70 miles per hour. However, its point-to-point times will be very low because it will be physically narrow, sharing available road widths more efficiently, while maintaining a high average speed over the entire trip.

Development of the compact, simple Individual Mobility Device, or 'IMD,' will be in accord with the 'ephemeralization' that Buckminster Fuller sees in our future. This he defined in *Saturday Review* as 'performance-upgrading by scientific invention; of doing more with less; of extracting progressively higher performance per unit of invested energy.' As his ultimate example, Fuller cites the ability of a quarter-ton satellite to carry more information than 150,000 tons of transoceanic cables. Why should the IMD not be the ultimate ephemeralization of personal transport, and an ideal substitute for the automobile in many of our daily missions?

So new is the IMD idea that its exact form is difficult to predict. Its basic power source will be electric – an efficient rechargable system – and its controls will be highly integrated with the human body so that operating it will involve very natural movements. Unlike many systems being proposed today, it will not draw its power from a fixed 'third rail' on the road. Most IMD's will be used only in urban areas, which will be illuminated at night by overhead lights or even by the artificial moons foreseen by Herman Kahn, so the IMDs will need no headlights.

Today's automobile builders will have many other opportunities in the diversified transportation world of 2000. They will probably build the 'people-tainer,' a concept of Kaiser Aluminum. 'When the family wants to go on a long, involved trip,' says Kaiser, 'the transport service provides the "people-tainer," complete with its fold down beds, toilet facilities, closet space, view windows, etc., whose dimensions have been standardized for handling over the whole system.' The unit would travel by air, sea or land, as required, and would become part of the recreation complex at the vacation site. Cumbersome luggage and the annoying interfaces of long-distance family travel would no longer exist.

Use of the 'people-tainer' is just one of many diversions that will occupy added leisure hours which loom so theateningly in the forecasts of many futurists. What about motor sports? Will we still be racing cars in 2000 as we were 100 and more years earlier? Certainly we will. But it may no longer be a competition of the very newest designs and concepts. The planet we live on is already a museum, as Marshall McLuhan observes, and by 2000 we will have staked out large areas for preservation and for reproduction of earlier eras, in detail we can't even imagine today.

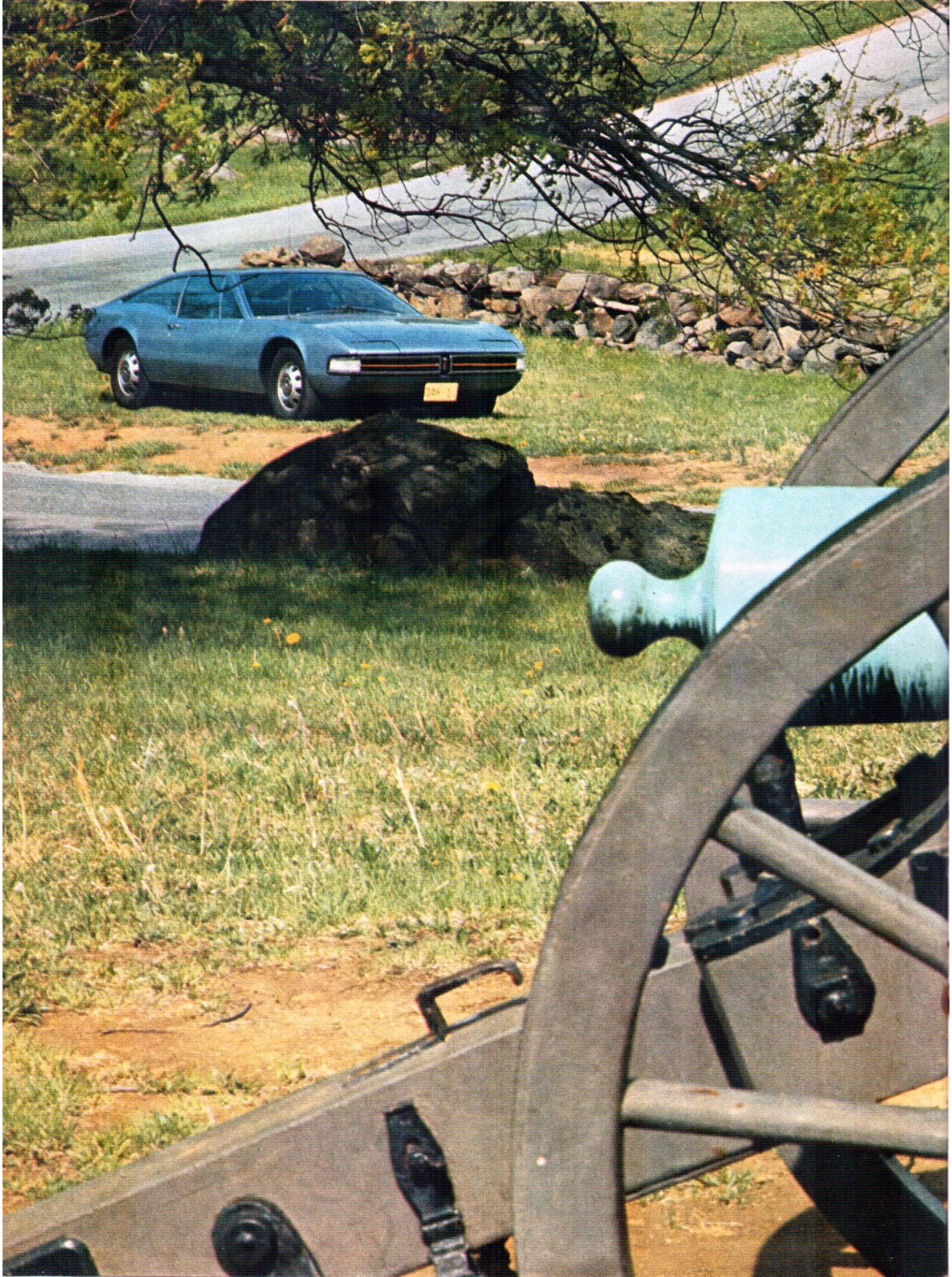
In 2000 you may be able to journey to Savannah, Georgia, to watch an uncanny re-enactment of David Bruce-Brown's victory in the 1911 American Grand Prize with the big red Fiat. Or to the Nürburgring (which, with Indianapolis, Le Mans, and Monza, will be a permanent racing shrine) to see Nuvolari's 1935 win over the German teams. Or, you may prefer to stay home, tuning in the race from your communications chamber and experiencing there the same sensations of sight, sound, and scent that Nuvolari felt at the wheel of his P3 Alfa Romeo.

A more direct sensation of real motoring in the old style will be available on some of the secondary roads of the mid-20th century, preserved on the outskirts of the great cities in the midst of the huge mechanically tilled farmlands. These networks of roads will be privately owned and maintained, open on a toll basis to those who would like to drive on them, perhaps in a vintage car from long ago, like a Lamborghini Miura. Other old-fashioned, piston-engined cars will be available for rental in these recreational areas. Races will be organized here, also, the emphasis being more on participation than on mere observation. In 2000 there will be far more interesting things to watch than a few cars chasing each other around; man will be risking his life by then in the colonization of the planets, and the people of earth will be watching him do it.

The automobile as an idea is durable because it fills a great human need for mobility and privacy. And privacy will be an even more prized commodity in the crowded world of 2000. Phychologist René Dubos stresses that human life depends on 'an environment in which it is possible to satisfy the longing for quiet, privacy, independence, initiative, and open space. These are not luxuries,' Dubos adds, 'but constitute real biological necessities.' Small wonder that the automobile, one of the most popular major products of any age, meets *all* these needs – though in return it also exacts it own penalties in human life and limb.

Possibly Don Fabun of *Kaiser Aluminum News* has the right idea. 'In all his active working years,' Fabun notes, 'man usually has but two refuges for privacy: driving his car alone or locking himself in the bathroom. Perhaps it might be possible to design bathrooms that offer the visual experience of a car moving along the highway. But then, he'd probably never go to work.'

In 2000, it will be an easy matter to design such a bathroom. Today, we can only guess what such technical implications might be for the automotive industry, and for our sons and grandsons who'll be buying its products a third of a century from now.



FEATURE/by Bob Kovacik

WILL MOTOR CITY EVER BUILD THIS CAR?

We gathered everybody together in one room to get opinions and, if possible, an answer. The speaker stood with smiling face, waited a proper moment, then said with enthusiasm:

"Okay everybody, let's hear it for Thor. Hey, that's enough . . . you'll wake the baby!

"Let's do it differently. You over there – pretty Peggy housewife. That's right, the plump little gal with the scraggly hair and tattered housedress."

"Me?" she asked, pointing a finger to her chest and lowering her blush-red face.

"That's right, dear. Don't be afraid. Stand up and tell us what you think."

She rose slowly, tugging at her Playtex (or is it playing with her Tugtex?). "Well, hee-hee. . ." she quickly raised four fingers to her chapped lips. ". . . uh, what was the question?"

"The question was, pretty Peggy: What is a Thor?"

"A sore?"

"No, no, NOOO, Peggy, Thor. T-H-O-R. Thor!"

"Oh, Thor! Don't get so mad at me. If you'd talk better, maybe I'd understand. Well, then, let's see. A Thor. Hmmm. Gee, that name sounds awful familiar. Oooh, yes. I know! A Thor is a make of washing machine."

"Sorry about that, pretty Peggy. No, a Thor is not a washing machine. Thank you. You may sit down. Well, let's see now. How about you over there in the far corner? Yes, that's right – you, Professor Prude."

Standing, the professor ran a hand through his graying hair, removed his horn-rimmed glasses, then cleared his throat. "Harrumph! Did you wish me to approach this academically, sir, or would you want me to, as you would say, give an off-the-cuff answer?"

"Look, Prude, all I want to know is what you think a Thor is."

A wry smile lifted one corner of his lipless mouth. "Well, sir, it would seem to me that a Thor is Castilian for a hurt." He scanned the room for a reaction, but only a few guarded chuckles filtered back.

"Very funny, Prude. I'm very glad to have that educated opinion. Now, let's get some other ideas. How about you 'sit-in' Charlie Campus? The fellow with the Columbia sweatshirt and placard."

"Yeah, rosebud, I'll clue ya," he said, languidly stretching to his feet. "Thor's a Scandinavian deity, and his bag is throwin' thunderbolts. He's often pictured with a hammer in his hand, like an ignorant, Establishment cop. DOWN WITH THOR! WE WANT FREEDOM! MORE NON-WHITES IN OUR SCHOOLS! MORE . . ."

"Awright, Campie, cool it! Go micturate on the dean's roses or something."

A crash brought the audience's attention to the far side of the room, where a pot-bellied, balding, unshaven small man had stumbled to his feet; a folded chair lay flatly on the floor. "Shun . . . I mean, SON," he bellowed, a half-empty can of Rheingold clutched in his left hand. "Shun, where inda hell you learn that kinda languish?"

"Look, pop, just go lay down on the couch and watch the ballgame or something, will ya?"

"Don't you talk to your father like that!" A black-clad, tiny old woman in the back of the room stood pointing her umbrella at the speaker.

"Mom! Please sit down. I'd hate to have you thrown outta here!

"Come on, guys. If I'm going to be up here and talk to you about the Thor, let's not argue, huh? Now where was I? Oh, yes . . . what is a Thor? Well, I'm afraid all of you are wrong. Let me tell you what a Thor REALLY is.

"A Thor . . ." he hesitated, picking his nose. "A Thor is a Gran Turismo. In other words, ladies and gentlemen, a Thor is something better than a Motor City car."

Murmurs spread through the aggregation: "Motor City! Better than Motor City! How can he say that?"

"But, sir," a small boy was standing, "isn't the right to blaspheme reserved for Ralph, Abe, and Willie?"

"Nosirree, boy. Not today! That's been changed, thanks to Abe and his speak-ins."

"DOWN WITH GOVERNMENT. DOWN WITH MOTOR CITY. DOWN WITH . . ."

"Shut up, Campie. I want to show these people the Gran Turismo. The car that will . . ."

"Yoo-hoo, Mr. Speaker!" It was cross-legged Kathy secretary. "Mr. Speaker, what's a Gran Turismo?"

"A Gran Turismo, cute Kathy, is an automobile. It's meant to carry four passengers comfortably and quickly, and generally has striking looks . . . like you do, Kathy."

"Is it a sports car, handsome appealing I'm-free-tonight, Mr. Speaker?"

"Yes, voluptuous Kathy, you might call it a sports car. Generally, you're on for dinner, it is a two-plus-two, which means that the back seat is for occasional use.

MOTOR CITY
Continued

In this country – the term Gran Turismo is Italian – we call it a Grand Touring car or, for short, GT."

"Thanks for your groovy answers, poopy."

"Harrumph! Oh, yes. Thank you Kathy . . . I mean, you're welcome, Kathy. Well now . . . uuuh . . . fellows would you draw open the curtains please?"

The curtains parted and there, on a podium behind the speaker, was a sleek, silver-blue, two-door automobile. The audience gasped: "Ooooh . . . aaah! It's beautiful. I want one of those. It looks like a Toronado, but no Toronado ever looked like that!"

"Aha! I heard that last one! As a matter of fact, folks, it IS a Toronado!"

"Is that a 1969 . . . or a '70? Boy, that's neat! Will Motor City build that car, Mr. Speaker?"

"Calm yourself, Lady Nerd. This is what we're gathered here for – to find out whether Motor City will build this car or not."

"Why wouldn't they?" Dr. Bills called out. "It should be an easy transplant."

"Actually it is easy, doc. The undercarriage or chassis is exactly the same as a Toronado. The only difference is the beautiful body – right, cute Kathy?"

"If you'd quit flirting with the sensual, young vixen, maybe we could go on with our discussion, Mr. Speaker!"

"Yes, I'm sorry, Lady Nerd. Was there something you wanted to say?"

"There was, Mr. Speaker. That automobile is too simple. It doesn't look attractive. I think we ought to beautify it . . . maybe a little more chrome, or plant trees on the hood!"

"Ah, but you miss the whole point, Nerd! Simplicity IS beauty. And the simple, flowing lines of this gorgeous automobile are not only palatable but functional as well. Did you know that we can get eight miles an hour more on top speed, just with this new body?"

"Er, ah, Mr. Speaker!"

"Yes, Abe, you can have the floor."

"Er, ah, Mr. Speaker, does this car have recessed knobs, seat belts, dual-braking system, warning lights, properly displayed turn signals, anti-glare dash, emergency flasher, shock-absorbing steering column, smog device, and air conditioning?"

"Yes, Abe, it does."

"Then, Mr. Speaker, what you mean to say is that if I were driving down the railroad tracks at 120 miles an hour and hit The Limited head-on, I would survive?"

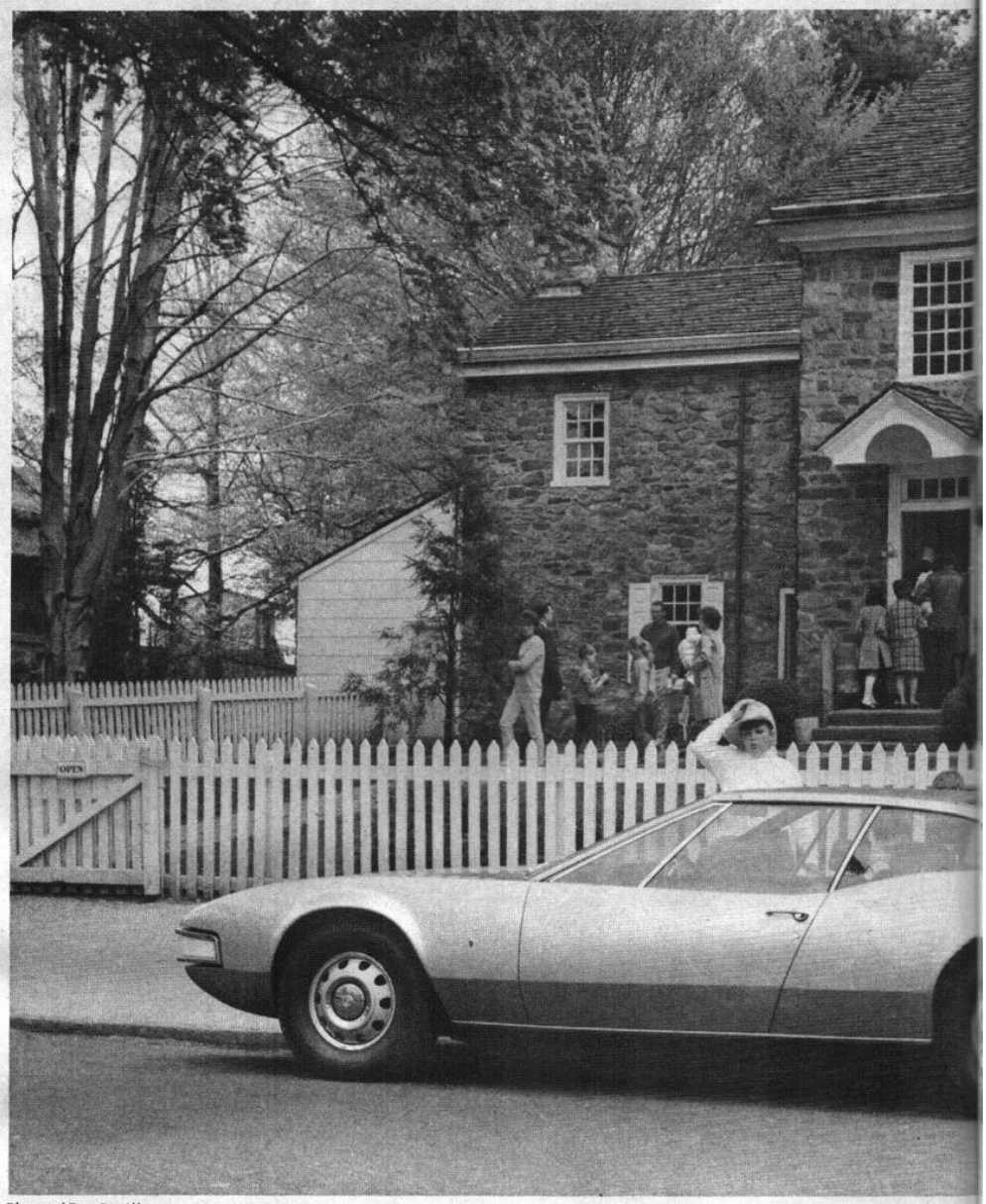
"Well, Abe, what would you be doing on the railroad tracks in the . . ."

"Never mind what I'm doing there. That's not the answer we are . . . er . . . seeking. We want to live, and it's not up to you to judge whether I was right or wrong driving down the railroad tracks at 120 miles an hour. The question was, would I be killed?"

"Just a minute there! I'd like to say something, Mr. Speaker."

"Okay, Willie, it's your turn."

"I'd like to direct my opinions to Abe. Now, Abe, what are you doing traveling at 120 miles an hour? It's just this sort of irresponsible thing that is forcing us to slow down you irrational drivers. I'm going to put a governor on your car to keep it down to 80 miles an hour!"



Photos/Pat Broiller

"Just you remember what you said, Willie. You called me irresponsible and irrational. If I want to drive 120 miles an hour, I'm going to drive 120 miles an hour. Just remember how you spoke to me. When Tom and I are . . ."

"Hey, Abe! Willie! Let's get down to the issue, which, in case you haven't been paying attention, is: Will Motor City build this car?"

"Over here, Mr Speaker. I can answer that."

"Okay, Dunky, go ahead."

"Well, Mr. Speaker, we at Motor City know better than any of you what YOU want. You don't want anything like this . . . this Thor! Besides it would ruin our A-B-C *body* program."

"You called me, poopy?"

"No, no, I didn't, cute Kathy. Would you please continue, Dunky."

"As I was saying, we know what the people want because we force our cars on them. What do they know anyway?"

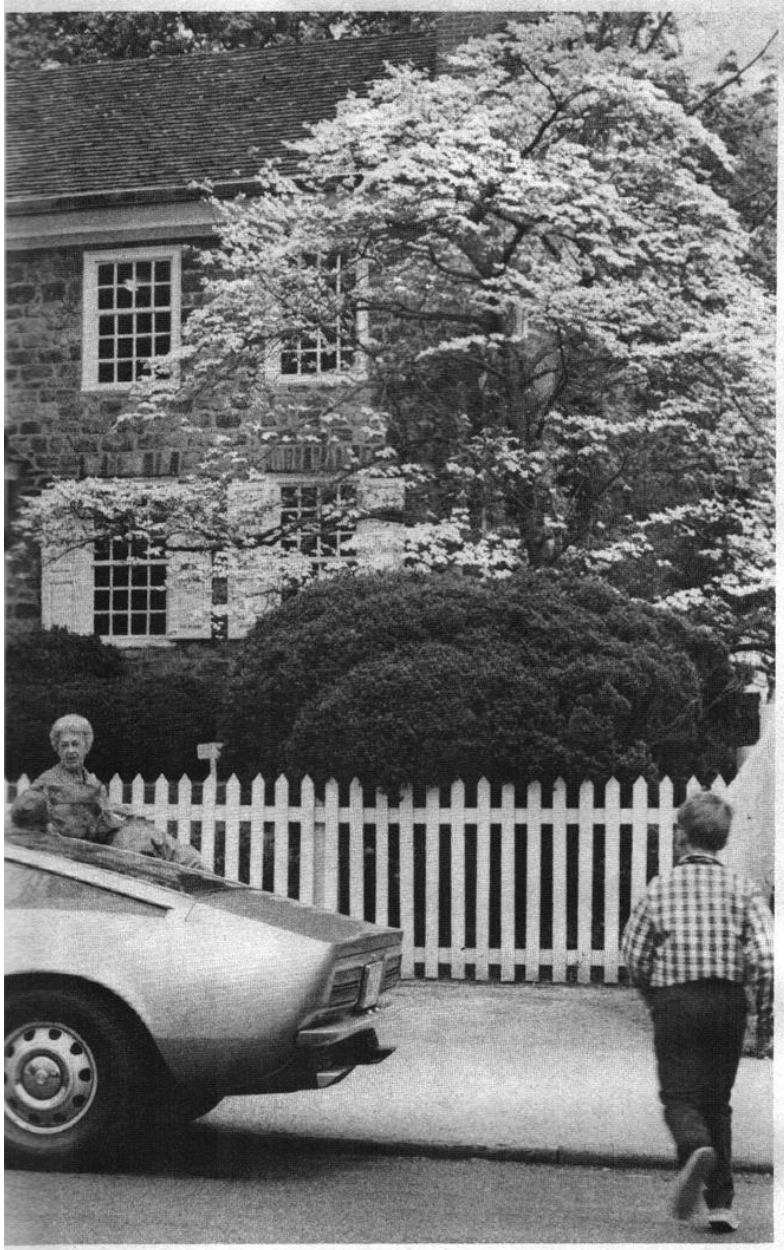
"I know what I want. Me, Joe Average. Why should you go on making decisions for me? I think Motor City's cars are sleds, dogs, just plain old Motor City iron. That's why I own the best in the world – a Volkswagen!"

"Let me tell you what we at Motor City think. It's dingalings like you, Mr. Beetlebrain Joe, who don't know nothing. We at Motor City are proud of our achievements. And it's you guys who buy those ugly, uncomfortable foreign jobbies that are nuts. YOU HEAR ME – YOU'RE ALL CRAZY. HAHAHAHAHA!"

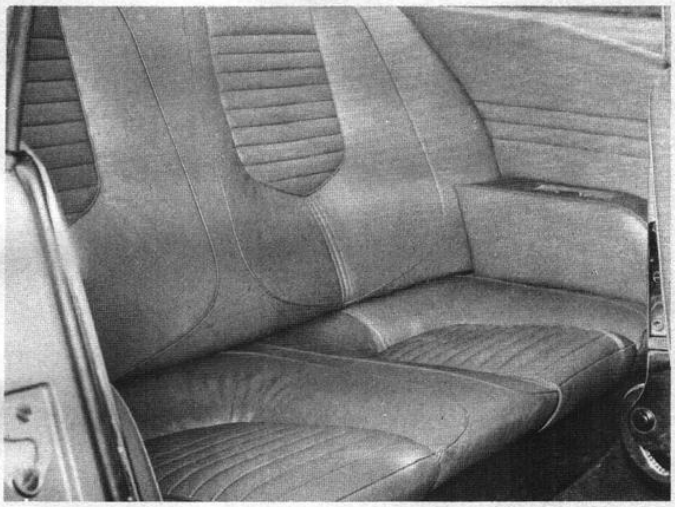
"Uh, Dr. Bills? I think my talk about the Thor is getting to our representative from Motor City. Would you take care of him please? And somebody take that baby bottle out of his mouth!

"There you have it, folks, straight from the Dunky's mouth. Motor City will not build this car, and did not build this car. It was made in Italy, by Ghia. And it's representative of what could be done!

"I want to point out, however, that only a few guys in Motor City are against this kind of great styling. Those engineers and



LEFT – George Washington never had a car like this parked in front of his Valley Forge headquarters before. But the reaction we got from the boy with the hat was the same reaction we got during our meeting. ABOVE/BELOW – now this isn't a Motor City interior, but it could be. And it's very comfortable, right cute Kathy?



stylists – they're really swingers. It's the higher-ups that are really bungling things."

"I don't think you're right, Mr. Speaker. One of those styling types I know drives a Chevy II!"

"So you don't like Chevy IIs, Peter Porsche. So what! There's a little thing around Motor City they call politics. And if you don't buy your boss's product, a stylist might never get a job better than sweeping clay-model drippings.

"Let's hear from someone about what this Thor should cost."

"I know, I know!"

"Okay, Penny Pincher, what's your estimate?"

"A thousand dollars, Mr. Speaker!"

"What!!! Oh, fer cryinoutloud, Peggy."

"Well, Mr. Speaker, you asked me what it SHOULD cost, and I told you. I think all cars should be given away free, and everybody should be a millionaire, and. . ."

"Aw, shut up, Penny! I'm not going to ask you guys any more questions. This car could sell for almost the same amount of money as a Toronado does today – $6000 to $7000. Of course it would require changing dies for the body design, which has to be done for a new model anyway."

"Did you call me, poopy?"

"No, cute Kathy. We were talking about the car's body, which is not quite as nice, I must admit. But . . . harrumph . . . anyway folks, if this car were to be built in Italy, it would sell here for somewhere between $12,000 and $14,000 because of limited-production procedures and tariffs that would have to be paid to bring it into this country."

"DOWN WITH TAXES! SUPPORT THE POOR! BURN YOUR DRAFT CARD! SOCK IT TO ME!"

"Somebody get that Campie out of here, will you?"

"Poopy?"

"Yes, cute Kathy?"

"Poopy, is it real comfy and warm inside – you know . . ."

"Why, uh, yes, cute Kathy. The seats recline and, if you happen to be driving, they're very comfortable also."

"MR. SPEAKER!!!"

"Why yes, Lady Nerd."

"Mr. Speaker, will you quit toying with that wench? Who cares if they build the car or not. Can it be used for a Johnny Treeseed expedition across country?"

"You and yer damn plants, Nerd. What's wrong with poverty and schools for a change?"

"Wait a minute, Earthy Catty, you can't talk like that to Lady Nerd! I was trying to explain to you people about the Thor."

"Verrry interrresting. . ."

"Somebody kick that German soldier out of here. What I want to know is if Motor City will build this . . ."

"Mr. Speaker, I . . . er . . . motion we adjourn this – . . . er . . . meeting and continue it on TV!"

"I'm not going to adojurn this meeting, Abe, you can't . . ."

"I second the motion!"

"Just a minute, Ralph. All I want to know is. . ."

"DOWN WITH MEETINGS! DOWN WITH AUTOMOBILES! DOWN WITH THE SPEAKER!"

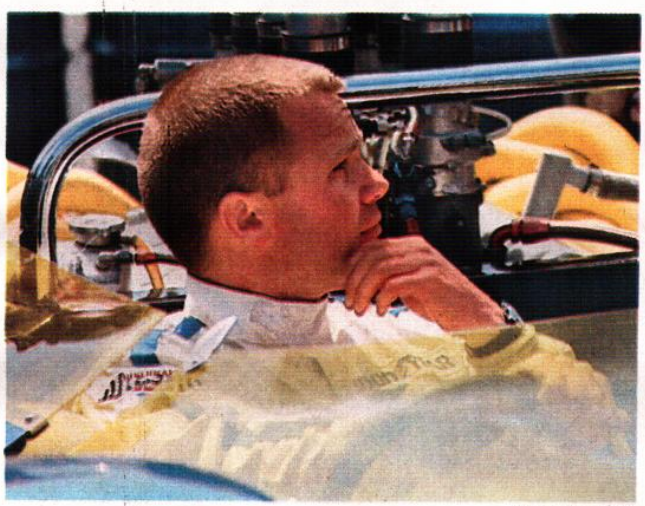
"Now stop that Campie! Listen guys. Wait a minute! Will Motor City . . ."

the color of road racing

A professional road-racing series in the United States didn't begin until 1963, when the first U.S. Road Racing Championship was held. Of course, those early starting grids were filled with amateurs — drivers known only by a small band of road racing enthusiasts. Today, however, the USRRC is in its sixth year and has begun to develop international talent. Some of the more prominent American drivers in the series are shown below.

Bud Morley

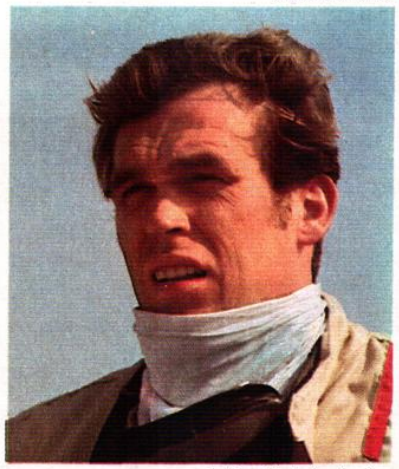
Jim Hall



Mark Donohue

Skip Scott

Moises Solana



Lothar Motschenbacher


64
1

TECHNICAL/by M. Wynn Mackenzie

W-12 REVIVAL

Future engines for Jaguar include a new V-8 and a possible record-breaking 12-cylinder design

COMING THIS FALL FROM A LEADING EUROPEAN AUTO BUILDER (Jaguar – Ed.) is a new, 60-degree V-8 engine of overhead-cam design. More narrow than the familiar 90-degree V-8 arrangement, and thus more suited to installation in an elegantly sporting car, this engine will, in itself, be exciting. However, it will probably be the first in a line of new engines – an initial step towards an unfamiliar but highly promising "W" type of 12-cylinder engine similar to the Napier Lion engine used in a former era to set many world land-speed records.

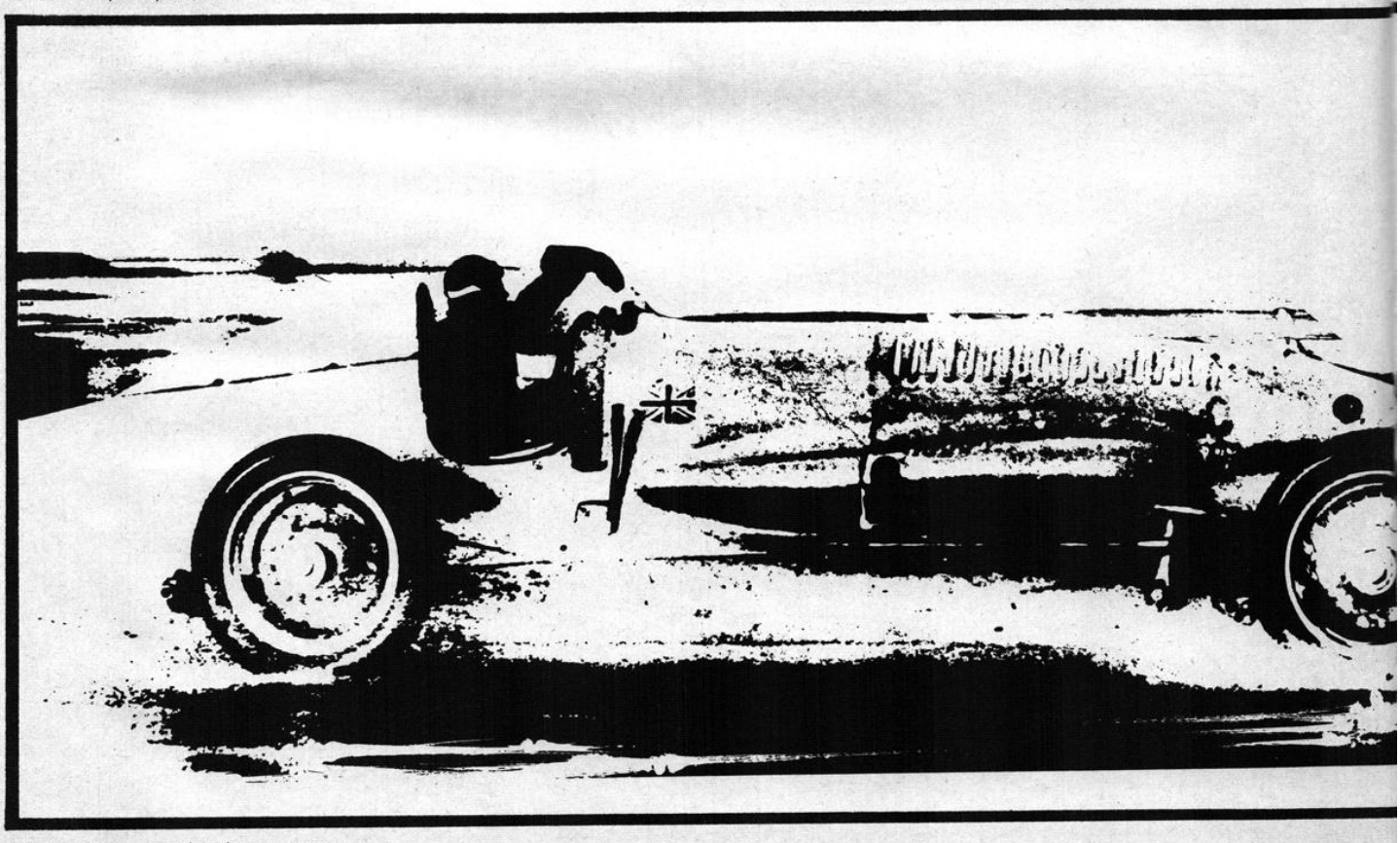
Details of the forthcoming 60-degree V-8 engine are still secret, but its very existence reinforces the point which the Ferrari/Fiat 65-degree V-6 Dino engine makes: that, in addition to a conventional few, quite a variety of engine layouts can be produced that will result in balanced engine design. A narrow-angle vee engine needs narrow cylinder heads for accessibility, so rumors of single overhead camshafts and of bowl-in-piston combustion chambers are likely to be true. This sohc-bowl-in-piston arrangement has proved to be highly efficient on the Rover 2000 and the Cosworth Formula 2 engines, and appeared on a Coventry Climax V-8 at the London Auto Show last fall.

Opinions that the new engine's designers have put on record in recent years, suggest that this 60-degree V-8 will have a "flat" or "single plane" crankshaft, akin to that of a four-cylinder engine. With this simplest of crankshafts (as used on all European racing V-8 engines), primary mechanical balance will be perfect. Firing intervals will be a "regularly irregular" 60- 120- 60- 120-degree sequence, with evenly spaced inlet and exhaust pulses in each cylinder head to simplify design of an efficient and smooth-sounding exhaust system. Secondary unbalance due to non-infinite connecting rod length will be in the form of a rotating force, about 13 percent less than that in a four-cylinder engine of the same bore and stroke. Flexible mountings would probably conceal this unbalance easily, or it could be eliminated altogether with a small balance weight rotated at double engine rpm on a shaft located directly above the crankshaft. (The balance weight is thus far theory, and cost might preclude its use – Ed.)

Six years of development are said to lie behind this new 60-degree V-8, scheduled for the 1969 season. Originally, it was conceived as the smaller alternative to a fairly conventional 60-degree V-12 engine, such as Ferrari has built for many years past. Now, apparently, that V-12 is unlikely ever to be marketed, but, instead, the existence of a much more exciting 12-cylinder project has "leaked" in engineering circles. The new idea for providing 50 percent more displacement and greater smoothness at some future date is . . . to tilt the 60-degree

Photos/M. Wynn Mackenzie and Petersen Publishing Co. Research Library

BELOW – the Napier-Campbell Special, powered by Napier Lion engine, set flying mile land-speed record of 174.883 in February 1927. RIGHT – the W-12 "broad arrow" engine has three banks of four cylinders each, with four valves per cylinder.



V-8 sideways 30 degrees and add a third bank of four cylinders.

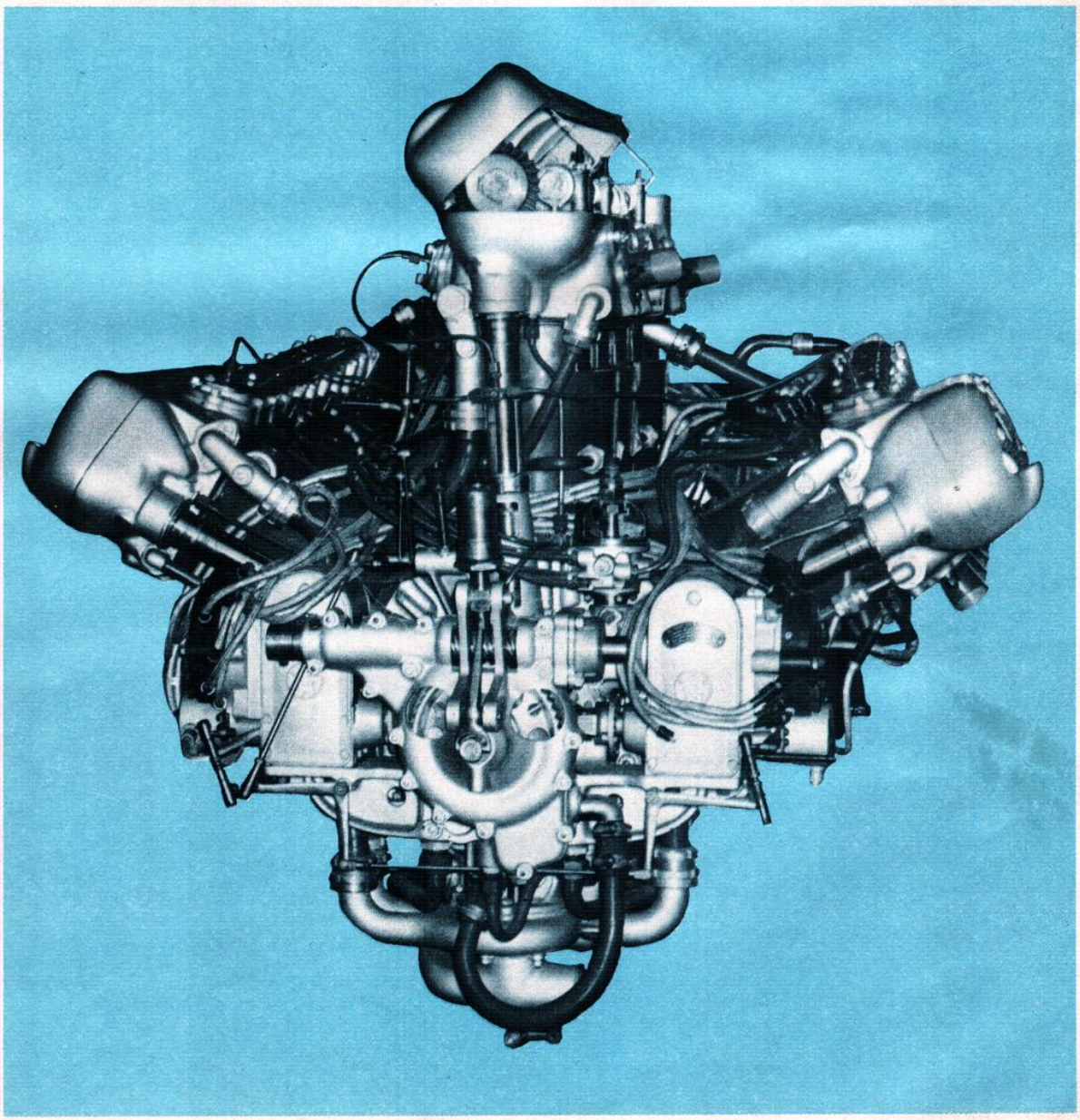
A novel idea? No, this is, in fact, an old aero-engine idea revived.

For a decade, beginning in 1918, the 1460-cubic-inch (23.9-liter) Napier Lion was one of the world's best aero engines, and it was a "broad arrow" or "W-12" engine of just the kind now being planned. Besides being used in aeroplanes (it powered seaplanes that set world air-speed records), Napier Lion W-12 engines also powered several giant racing cars. One such engine repeatedly broke the lap record at Brooklands track, and others powered cars which set many world land-speed records, from Malcolm Campbell's 174.88 mph Napier-Campbell of 1927 until John Cobb's 394.20 mph Napier-Railton of 1947. There is no room for doubt about the practicability or soundness of the broad-arrow W-12 engine layout, even though it has not yet been used in a production car. (The main reason why it hasn't been in production is cost. With the additional casting, cooling, and crankshaft design, it could cost twice as much as a conventional V-8 – Ed.)

Why should a famous car builder consider reviving an engine layout which aircraft engineers abandoned 40 years ago? Because the reasons for which the W-12 aero engine was superseded by V-12 units do not apply within modern car shapes. For today's cars, the merits of the W-12 are attractive. In yesteryear's single-seat fighter aeroplanes, frontal area mattered much more than did engine length, so the broad-arrow engine with 120 degrees between its outer banks of cylinders was outpaced by longer, slimmer, 60-degree V-12 designs. In most modern car shapes, however, it would be easy to find sufficient width under the hood for a broad-arrow engine, and the saving in length as compared with a V-12 would be most welcome.

How wide will a broad-arrow W-12 car engine be? At first consideration, it would seem that a 120-degree engine must be wider than the familiar 90-degree V-8 units, but some figuring quickly shows this idea to be false.

When Buick engineers began to study V-6 engines, they made a careful analysis of 60-degree and 120-degree vee angles, which would have had certain advantages over the 90-degree V-6 design eventually put into production. For equal *bore* and *stroke*, Buick found that a 120-degree engine would have been ten percent wider than a 90-degree engine. However, for two engines having equal *displacement*, cylinder size is reduced in the one having more cylinders; thus, a 12-cylinder engine needs bore and stroke dimensions only 87.36 percent as large as those in an eight-cylinder unit, and most other dimensions can be scaled down in about the same proportion. In comparison with a V-8 engine of equal



displacement, a W-12, with its smaller bore and stroke dimensions, should be about one inch narrower and two inches shorter, yet it should also be smoother, faster-revving, and more powerful.

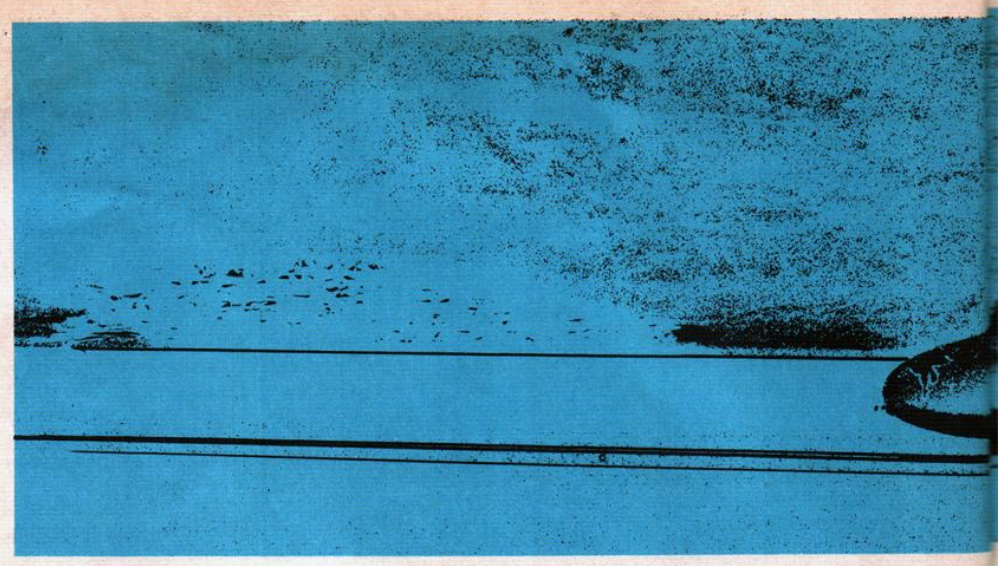
If, as seems highly probable, the broad-arrow project for a W-12 car engine goes ahead, it will be backed by close engineering study of the Napier Lion engines of 40 years ago. Therefore, I, too, went in search of a Napier Lion engine, finding one in London's Science Museum, and looked closely to see which features might reappear in a modern successor.

In the Napier Lion engine, the four-throw crankshaft was a two-plane design exactly as in Detroit-built V-8 engines. I shall be rather surprised if this feature is copied, because it complicates gas flow by producing irregular spacing of gas impulses in each cylinder head, and because I know the engineers concerned value good gas flow above perfect secondary balance in an engine. (This is also mandatory because of federal emission laws – Ed.)

Radial aero-engine practice was followed in one feature of the Napier Lion – the use of four "master" connecting rods in the four vertical cylinders, with connecting rods from the sloping cylinders articulated to wrist pins on the master connecting rods, instead of having their own big-end bearings on the crankshaft. Exactly the same layout could be used again, with more modern materials and proportions, but I rather think that we will see the three cylinder blocks slightly staggered in the manner usual on V-8 engines, to permit use of three side-by-side big-end bearings on each crankpin. Forty years ago, engineers were frightened of high rubbing speeds in large-diameter bearings (They still shy away from large diameter bearings because of their high wear rate – Ed.), whereas today they fear long bearings within which shaft flexibility may cause uneven load distribution. However, the old Lion was very modern, with its "over square" cylinder proportions (5.125-inch stroke X 5.5-inch bore), so its layout of articulated connecting rods would obviously fit into a modern engine, if desired.

Half a century ago, the W-12 Napier Lion was designed in the then-usual manner, with three cylinder blocks bolted onto a separate crankcase casting. A single-overhead-camshaft engine with in-line valves could readily be built with a fixed cylinder head, in the Offenhauser manner, on each removable cylinder block. I can see no insuperable problems, however, in making one casting combine three blocks of four cylinders (or housings for three lines of four "wet" cylinder liners) and a five-bearing crankcase. Assembly would only become difficult if, with a 120-degree angle between the outer banks of cylinders, the crankcase were extended below the crankshaft centerline to form a more rigid Y-block casting.

Surprisingly, the Napier Lion design of 1918 was really the extreme case of the most modern trend in narrow-angle, four-valve cylinder-head design. Keith Duckworth on the V-8 Ford Formula 1 engine and Harry Weslake on the rival V-12 Eagle design, have recently narrowed the included angle between two inlet and two exhaust valves per cylinder, leaving a minimum of room for spark plugs between the camshafts. Fifty years ago, Napier had double-overhead-camshaft operation of four valves per cylinder on the Lion engine, reducing the angle between inlets and exhausts to zero, and placing two spark plugs on opposite sides of each combustion chamber instead of one plug near its center. This was just as good a design as the modern ones for short flame path, and more compact on an aero engine, which, for reliability reasons, had to have dual ignition anyway. However, in 1970 I shall expect to see single overhead cams rather than double overhead cams on very narrow cylinder heads.



ABOVE – John Cobb's fastest world record of 394.196 was set in 1947 in Railton Special, which was powered by two second-hand 1928 Napier Lion engines. RIGHT – narrow four-valve cylinder heads on the three-bank 12-cylinder Napier Lion aero engine anticipated modern Formula 1 Grand Prix designs. If an engine of this type appears in a future European car, sohc will probably replace dohc.

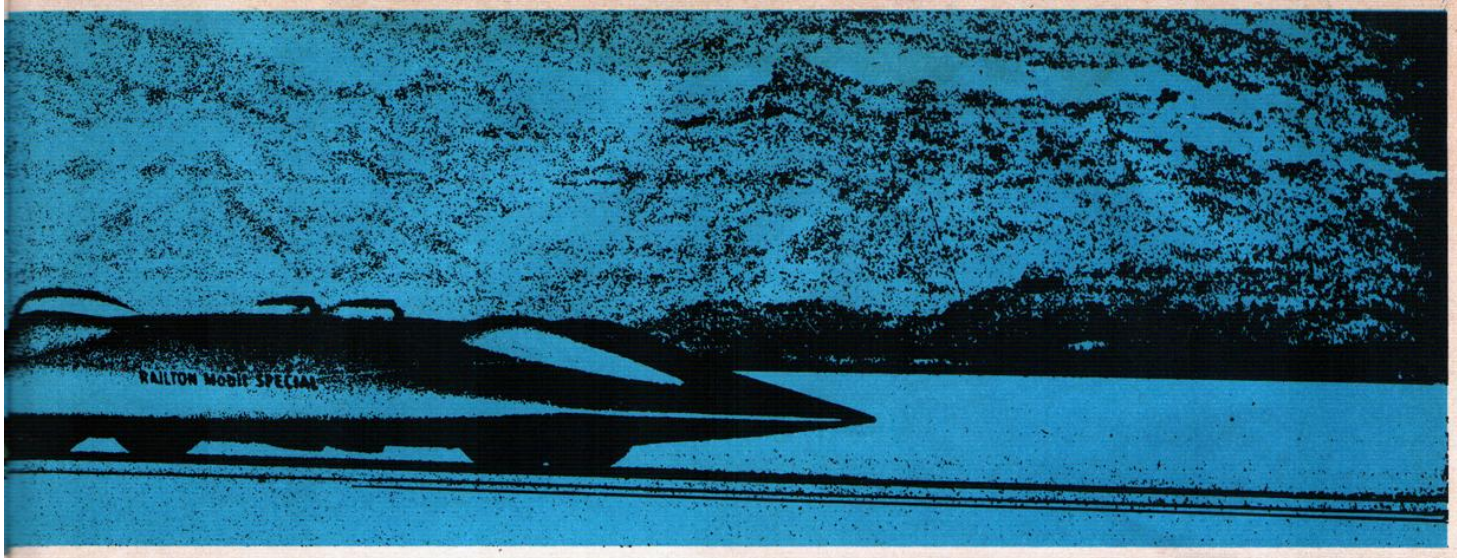
In a broad-arrow engine with three banks of cylinders, manifolding cannot have the elegant symmetry that is usual on V-8 and V-12 engines. On the Napier W-12 units, the two outer cylinder heads had exhaust ports beneath them and inlet ports above them, in the manner now usual on production V-8 engines, and the central third cylinder head was constructed identically to the right-hand head. Thus, on one side of the broad-arrow engine, the space between two cylinder heads accommodated two 4-cylinder induction manifolds, whereas on the other side of the engine, an equivalent space between cylinder heads accommodated one inlet manifold and one exhaust manifold. I think the W-12 engine now being explored must have cross-flow cylinder heads arranged in exactly this fashion.

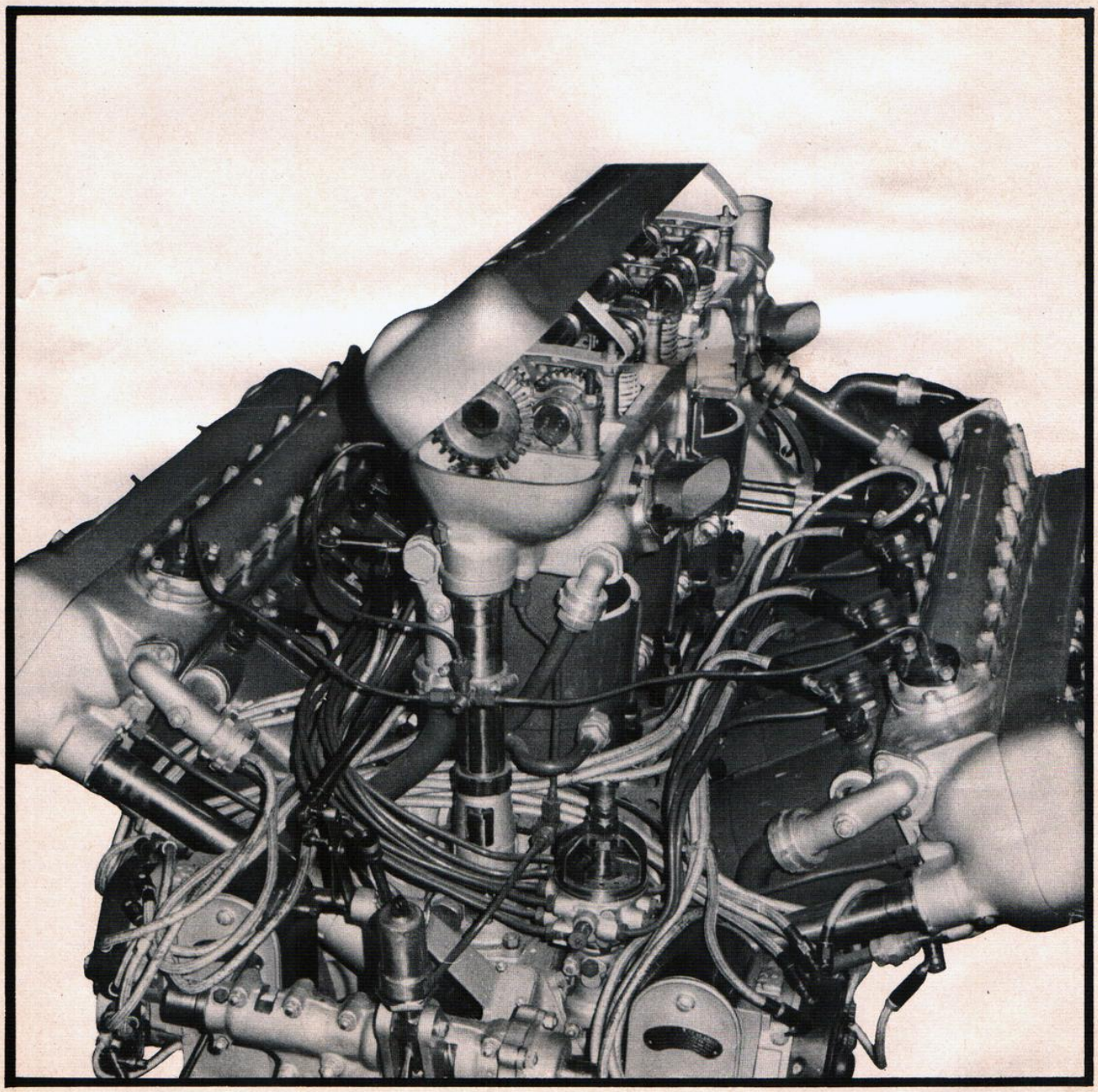
Because it cannot be entirely symmetrical, the W-12 engine will encourage present-day designers to abandon carburetors in favor of timed fuel injection into individual inlet ports. Excellent systems now offered by Bosch or Kugelfischer in Germany, and Brico or Lucas in England, would eliminate problems of designing carburetors and manifolds which, fitting into limited space, would meter and distribute fuel equally well to both upright and steeply sloped cylinders. Fuel injection can assist compliance with pure-air regulations, using pre-heated air during all but maximum-power operation. I don't think it will prove unduly difficult to design a single-overhead-cam cylinder head which vents steam from its cooling water passages equally well when upright or when tilted at 60 degrees in an exhausts-downwards sense (It's fairly easy with today's high-pressure cooling systems – Ed.).

For production engineers, the attractions of a 60-degree V-8 engine are strong, because the same automated transfer lines could machine parts for it and also for a 60-degree V-12 engine. However, such a transfer line could just as easily be arranged with the facility to handle W-12 blocks with 60-degree angles between adjacent banks of cylinders. Cylinder heads, pistons, connecting rods, valves, and many other parts could be identical on both a V-8 of 250 cubic inches and a W-12 of 375 cubic inches.

One final thought: There could be no finer way to convince the public of the new-old "broad arrow" W-12 layout's excellence than by success in Grand Prix road racing. It seems highly probable that a W-12 racing unit might, indeed, offer the maximum of power from three-liter displacement for a minimum of bulk. Such an engine might turn faster than the V-8 Ford, because of smaller cylinder dimensions; faster than the V-12 Eagle, B.R.M., and Matra units, because its short crankshaft would be less vulnerable to torsional vibration. (A W-12 configuration also gives bundles of torque in the low rpm ranges – Ed.)

Is a broad-arrow W-12 engine really going to emerge from Europe in the next few years? It seems highly probable, because, if one firm eventually decides against the cash investment needed to go ahead, the engineers who have been working on this project will surely soon be hired by other companies. Perhaps it is not a question of whether or not we will see the broad-arrow 12-cylinder engine, but simply of how soon and from which plant in which country it will come first!


RAILTON MOBIL SPECIAL



IDAHO SPORTS CARS ON CAMPUS

University of Idaho

Collegiate car competition, camping and other capers in the Great Northwest

Photo / Jean Calvin

THE SETTING IS THE UNIVERSITY OF IDAHO AT MOSCOW, U.S.A., REFRESHINGLY FREE OF CHAIN-LINK FENCES and possessing a "halls of ivy" atmosphere in which flourishes a young, but very active group of sports car enthusiasts. Listing 30 members, the University of Idaho Sports Car Club (UISCC) was chartered only last November, and, though officially affiliated with the school and receiving a bit of support from the University activities budget, is not required to have a faculty sponsor. The club officers prefer this state of affairs, and have accomplished organizational wonders in a very few months.

The club members spent last winter tinkering with their cars and putting on a few small rallies, but as soon as the seasonal snows began to melt, they got into the slalom business. Their most successful slalom, called "Gubkhana," was held in early March on the used-car lot of the Gub Mix Chevrolet-Oldsmobile dealership in downtown Moscow, which donated everything for the event, including trophies. The event was a smash hit, drawing over 60 competing cars and about 2000 spectators, and is now planned as an annual affair.

The most ambitious project to date undertaken by UISCC was the Winchester Hillclimb, held early in May despite final exams and organizational problems. The site chosen was a twisting, winding road through spring-green hills, formerly part of the main highway but now providing a route only to the town of Winchester (population 450) and a few farm homes in the area. The enterprising UISCC members consulted with nearby wheat farmers and the highway patrol, and received permission to close a five-mile stretch of the road to daylight traffic over a weekend.

The fledgling group also joined the Northwest Conference of Sports Car Clubs, thereby qualifying for the insurance coverage necessary when putting on a high-speed event. They also received invaluable help from Brooks Hanford of Pullman, a long-time officer of the Conference and participant in sports car competition. Brooks was pressed into service as chief steward of the event, and was on tap from dawn 'till dusk both days. Unfortunately, Conference insurance rules say one has to be 21 years of age or older to compete, which excluded all but seven from the University club. However, those under age cheerfully pitched in on the tech lines, worked the turns and scoring, and generally did all of the unsung jobs connected with staging a hillclimb.

The six-dollar entry fee could not begin to cover expenses of the event, but over 20 good merchants from the surrounding towns donated money for trophies, a Volkswagen bus for emergency use, an Olds for the course car, fire extinguishers, basket-type stretchers for canyon rescue work, and, although the hay bales were not free, one young member liberated a truck from his father's farm to transport the hay. In addition, the Lewiston Amateur Radio Club supplied a covey of mobile units for use as communication and timing stations along the 4.2-mile course.

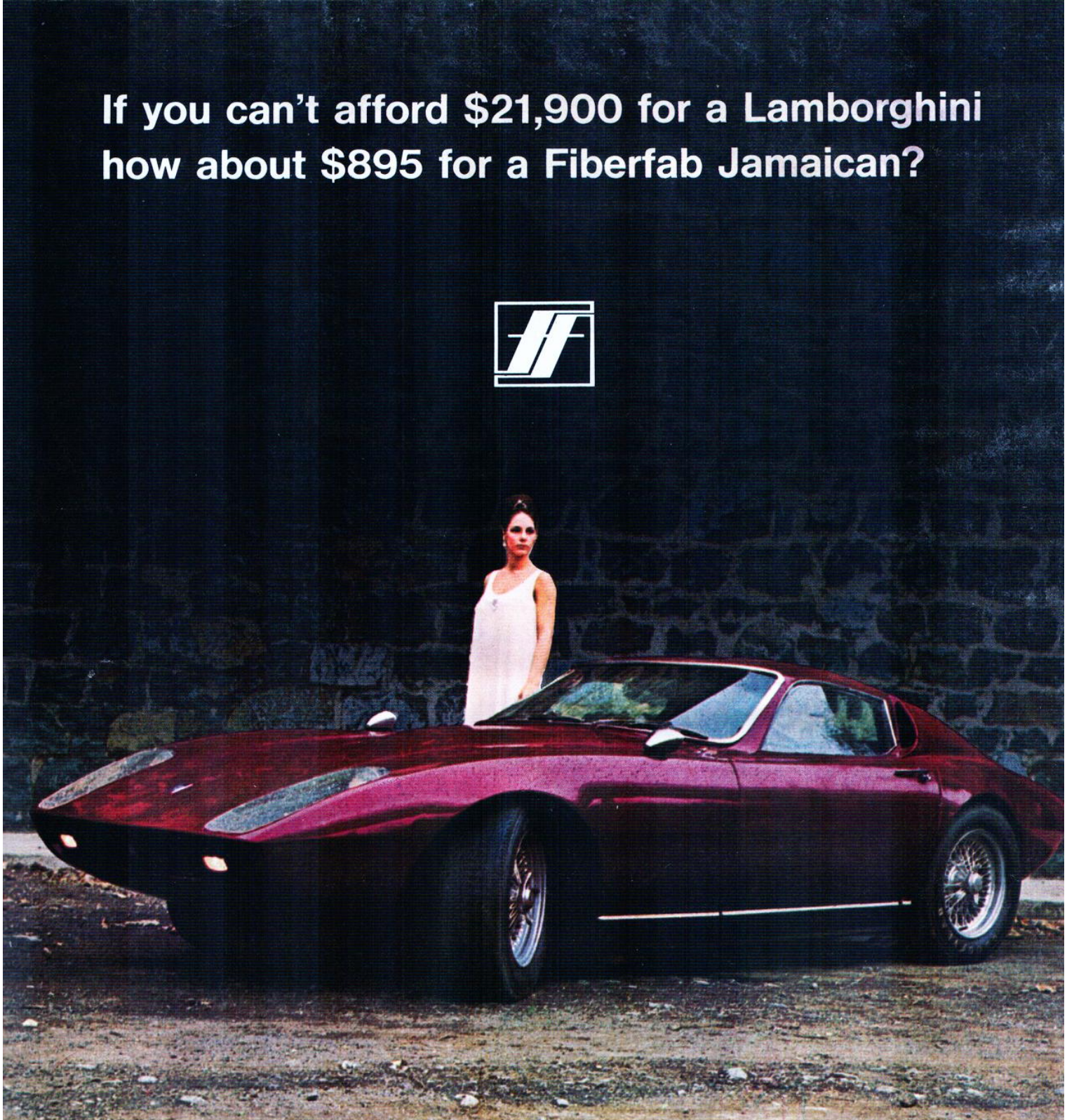
Saturday action was fairly relaxed, with the usual spate of hang-ups common to a first-time event. However, half the entry was not due until Sunday, so everyone in attendance got a few practice runs. That night, most of the competitors camped out amidst pine trees alongside of a lake near Winchester. The Mayor of Winchester, who is also the local grocer, sportingly offered 95-cent steaks to everyone involved with the hillclimb — a barbecue pit was rapidly improvised at the campsite by the hungry group.

On Sunday, the entry list topped out at 45 cars, and each participant got one practice shot and two timed runs at the hill. Fast time was captured by Bren Gardner of Boise, in a new 427 Corvette coupe. He was hard pressed for honors by Paul Jaremko of Spokane, driving a Solex-carbureted Datsun 2000, who finished second by a mere 2.3 seconds. There were a few mechanical failures, but, happily, no serious off-course excursions.

Everyone involved, from the residents on the hill to the Conference insurance agent, was happy with both the event and the new UISCC organization. UISCC officers Rick Tackman and Charles and Merlene Fletcher had more than a little to do with the success of this and previous events. Along with other mainstays of the club, they will be back in school next fall, so watch for the Winchester Hillclimb to become a major event on the calendar in the great Northwest.

Fred Nordby's GT 500 thunders through pine forest about halfway up Winchester grade.

If you can't afford $21,900 for a Lamborghini how about $895 for a Fiberfab Jamaican?



The uncluttered, graceful contours of the Jamaican set it apart as a classic in automotive design. Created by Fiberfab for individuals seeking the uncommonplace, the Jamaican body kit transforms the ordinary into an exotic sportster. Precision engineered for MGA, Austin-Healey, TR-3, TR-4 and Volkswagen chassis. Guaranteed to capture the attention and admiration of any crowd! Other body styles available for cars listed, as well as Mustang, Corvette and Corvair. Priced from $395.

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FEATURE/by Peter Brock

THE MINI-K ...THREE WHEELS GONE WILD

A high-performance fun car for most anywhere

WHETHER WE REALIZE IT OR NOT, GOVERNMENTAL CONTROL IN ITS MANY FORMS has always had much to do with the design of our motor vehicles. Vehicle taxes, especially, have had great influence on manufacturers and designers, and this is one reason why the three-wheeled automobile has never achieved the popularity in the United States that it enjoys in Europe and Japan.

In the eyes of the law, any three-wheeled vehicle is considered a motorcycle, and this is the prime reason that three-wheelers have achieved such high popularity in countries where taxes on conventional automobiles are relatively high. Foreign governments, in an attempt to create industry and mass transportation at an inexpensive level, have allowed motorcycles to operate with minimum payment of road tax. The immediate post-war years in Europe and Japan nurtured the tri-wheel design in every possible variation except the performance-oriented vehicle, which was economically unfeasible at the time.

The three-wheeled vehicle never gained a foothold in America for several reasons. The very nature of our highway system tends to favor the high-speed stability of the four-wheel vehicle over the conventional, single-nose-wheel "Trike" layout used on most three-wheeled commercial vehicles. This, coupled with the fact that there was no performance type three-wheeler available except the Morgan (which was not imported into the United States), almost eliminated the tri-wheeled vehicle from the American scene.

Most efforts in the tri-wheel layout have been aimed almost exclusively at the so-called "economy market," with almost no thought of high performance entering designers' minds. Consequently, most of these vehicles have had the single wheel placed at the nose so the pay-load could be more evenly distributed over the two rear wheels. There are literally thousands of vehicles of this design scurrying about Japan and Europe. Their adaptability to the crowded road conditions and limited parking facilities of the big metropolitan centers, combined with their economical operating costs, make them ideal for small business and fleet operators. In spite of this commercial-vehicle success, no manufacturer since the early post-war years has done much about the "automotive" market. The early popularity of the Messcherschmitt, Goggomobile, and Isetta "Kabinroller" economy vehicles waned as the boom economy in Western Europe enabled the masses to purchase real "full size" automobiles like VW, Renault, and Fiat. No foreign manufacturer has elected to pursue the three-wheel market, with the exception of the two conservative English firms who continue to produce the Bond minicar and the Reliant Regal in limited quantity. The most popular three wheeler of all time, the English Morgan, went out of production many years ago due to increasing popularity of the four-wheel version, which is still in production.

The concept of a performance "trike" has come under careful scrutiny lately in Europe, where side-car motorcycle racing has long been popular. The typical "side-hack," built around a conventional motorcycle layout, is fast being replaced by young English designer/builders, who carefully reread the rules, threw convention to the winds, and started with blank sheets of paper. This new breed of racing trike has almost universally adopted the "two in front, one at the rear" layout which resembles a three-wheeled, two-man Formula Junior race car with a transversely mounted front engine. Owen Greenwood's trike, one of the more famous side hacks, uses most of the components from the front of a 1071-cc Mini Cooper, while other racers use BMW, Triumph, or Vincent engines. The results are astonishing. The new designs are pulverizing lap records wherever they go and completely changing the sport of side-car racing in Europe.

Our new smog-control and safety laws, by their design-limiting nature, have given many American designers second thoughts on three-wheelers. The trike is a motorcycle and, consequently, isn't bound by all the bureaucratic legislation now attached to the conventional four-wheel layout. This whim of bureaucracy, in decreeing any three-wheeled vehicle a motorcycle, has created an ideal market for the small designer-constructors like Walter Korff of 449 North Larmer Street in Burbank, [illegible].

Korff is leading the vanguard of [illegible] performance-oriented three-wheel[illegible] his prototype, the "Mini-K," actual[illegible] ning and undergoing a complement [illegible] Delivery of the first production kits beg[illegible] in August.

Korff is an unusual engineer. He is able to successfully combine his very sophisticated engineering background with the practical problems that face the weekend racing mechanic and backyard-special builder. In spite of having worked on some

Photos/Bob D'Olivo and Gerry Stiles

THREE WHEELER

Continued

of the most advanced designs at Lockheed Aircraft over the past years, and of being aerodynamic consultant on the world land speed record holder for wheel-driven cars (the Summers Brothers' Goldenrod), Walt still has the sensitivity to appreciate the problems that face most of us when we go out to the garage and survey our limited mechanical facilities. Ask anyone who is used to working with million-dollar government budgets and scores of trained personnel what they might consider a really difficult task, and chances are they'll tell you that the most difficult task is to design something simple, inexpensive, and foolproof. Korff's Mini-K is just such a solution. It's not designed to win the Grand Prix at Nurburgring, or transport Aunt Emma and the family to Maine for the summer; its only purpose is fun. It's an absolute gas to drive and even more fun to work on, especially if you never had the chance to work on a racing car with its easily accessible components.

The Mini-K is a tinkerer's delight. Practically everything is adjustable and easy to work on. It would be difficult to say to what age market the Mini-K will be most appealing, but it should have a very strong attraction for the under-21 age bracket who can't yet get a competition license, but who are really anxious to learn about road racing. The Mini-K is the ideal vehicle for the weekend warrior on the slalom circuit. The chassis can be tuned quickly to each "circuit," and the quick power-plant change feature means he can drive the "stock" version during the week, then install the "racer" engine in a few minutes to challenge the clock.

Korff's "K" is sold as a complete vehicle with any choice of power plant, or as separate components so that the economics of the venture won't overwhelm the budget-minded constructor. Korff will also sell any part or assembly – for example, the complete front end – to someone who might have a similar project in mind but wants to experiment with a chassis design of his own.

If the client has more than the average complement of tools and feels he can construct a chassis from raw tubing and sheet metal, Korff will sell a complete set of blueprints for $18, which is refunded when the machined wheel-castings and specially fabricated components, like suspension uprights, are purchased from Korff to complete the car. The Korff Company is catering directly to the low budget, special builder, and will work directly with him in any way to help him complete his car.

As for the first Mini-K prototype, well, it can only be described as fun. This particular "car" is Yamaha-powered, and we found it just a bit slow, but Korff has a fuel-burning, 650-cc Triumph twin engine setting on the shop floor. The sub frame for this unit was nearing completion on our last visit. We made him promise to call us for the first run, since it will probably prove to be as exciting as the first Saturn lift off!

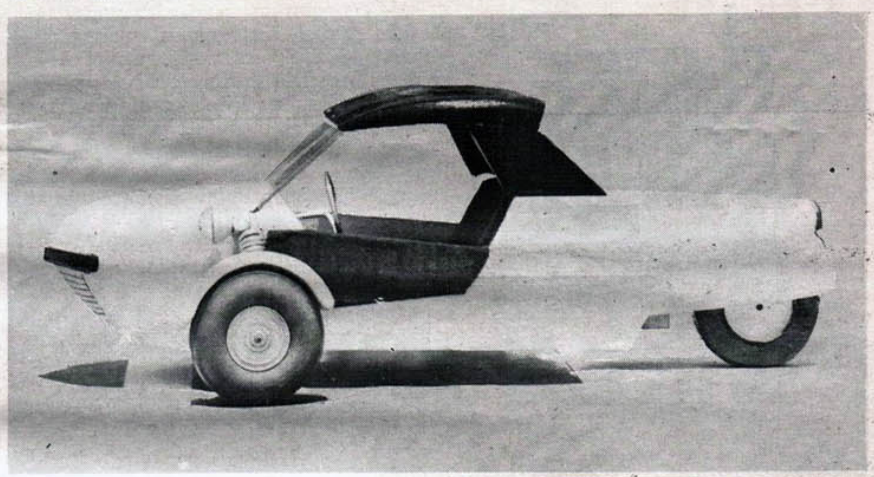
Driving the prototype was a unique experience for all of us from the SCG staff. Korff and assistants Chuck Slover and Nick Nicholas had finished the "K" only hours before our arrival, and they had never ventured farther than a quick lap or two around the block to check everything before we arrived.

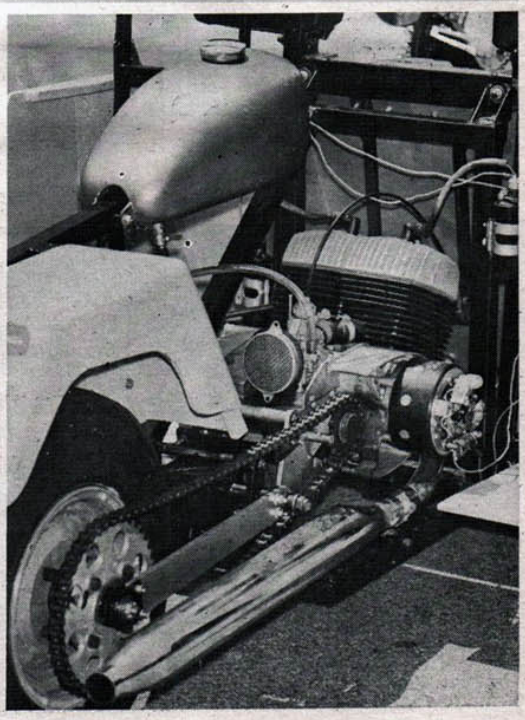
Because of the "two-in-front" design, driving the "K" is almost like driving a conventional, four-wheel mini-car. Third wheel? Out of sight, out of mind. Once seated in the cockpit, one forgets all about the unconventionality of the design and begins to enjoy driving. There's a great deal of leg room in the Mini-K, and, in spite of its small overall dimensions, one does not feel cramped. Because of the motorcycle power-package, the gear shift is progressive – forward to upshift, rearward to downshift. The clutch is a bit sudden on the prototype, but Korff explained that he is experimenting with sprung hubs to reduce shock loading from standing starts. Once underway, the gear shift is easy to operate and the steering, of course, is light and positive. Our test area was a large parking lot, similar to those used for slaloms or gymkhanas, and everybody took a turn at bending the "K" through an imaginary pylon-marked course at speed. The balance of the car is predictable, and the ability to place the "K" through tight esses or hairpins is amazing. It has definite understeer characteristics, very much like a go-kart. The Yamaha engine permitted a top speed of about 60 miles per hour, and this was felt to be a bit slow for some of the faster West Coast slalom events. It is possible to spin the "K" by bending it into a turn and then cranking the wheel over gradually to keep the bite on the front tires. There is no tipping sensation when the "K" spins, and the feeling is just about the same as spinning a small formula car.

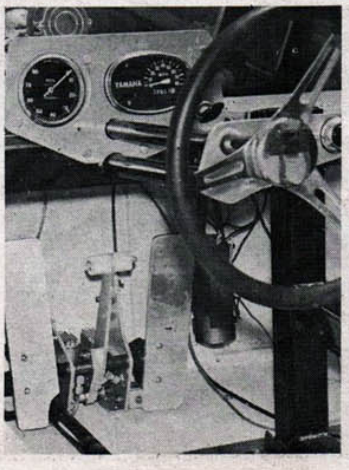
The design of the chassis is such that no feeling of twist or distortion was noticed; in fact, the "K" felt remarkably solid for a vehicle of this type, even in the most violent maneuvers. The vibration of the two-stroke engine was transmitted through the chassis, though, which tended to be a bit annoying, especially on the overrun. The fact that the interior padding of the car had not yet been completed might have had something to do with this. We tried installing some cushions to sit on, and this helped considerably.

It was really difficult to decide exactly

Continued on page 54



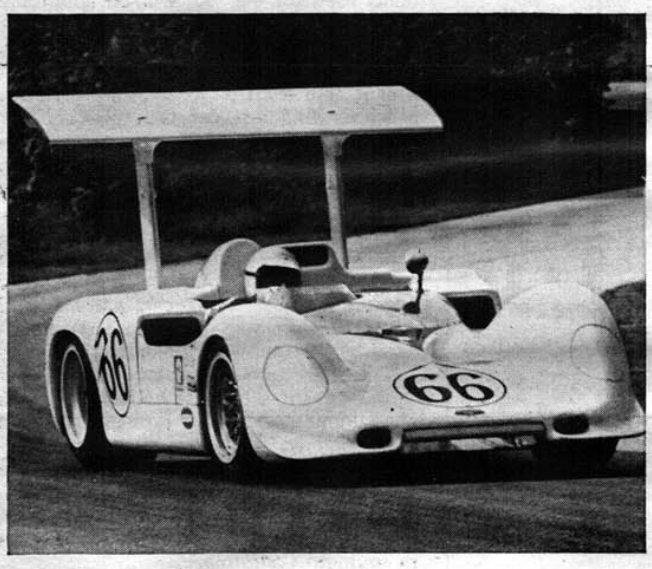




Above, a model of the assembled Mini-K shows body styling of the production-kit units available to customers beginning in August. Right and below, views of the prototype unit driven by the SCG staff.

Spark plug advertisers go to great lengths to use race drivers.

Jim Hall went out of his way to use us.



This may surprise you.

Spark plug and automotive advertisers induce race drivers to use their products.

This is the reason you find a lot of advertising after a big race that claims several different products were responsible for a single victory.

In a way, Robert Bosch started the whole thing. In 1908, he put his newfangled spark plugs in a Mercedes and it won the French Grand Prix. Bosch was happy. Mercedes was happy. And they let it go at that.

We haven't changed our philosophy much in 60 years. We still don't make it a project of seeking out race drivers just for the use of their names. This is why Bosch was pleased when Jim Hall, after testing many spark plugs, came to us.

So now he uses Robert Bosch plugs in the famous Chevy-powered Chaparral cars which he builds and drives. Cars that have won in competition from Nürburgring to Sebring to Riverside to Watkins Glen. And he uses them in his wife's Chevrolet—the same plugs that will give you perfect performance in your car, no matter what the make.

Next tune up, insist on Robert Bosch spark plugs. You'll get the same sparkling performance Jim Hall gets.

As for race endorsement ads, this is it. We have to get back to work.

ROBERT BOSCH CORPORATION

New York • Chicago • San Francisco • 2800 South 25th Avenue, Broadview, Illinois

how the Mini-K could best be used; everyone had different opinions. Some felt it would make an ideal third car for shopping and chasing the groceries, while others tended to look upon the "K" strictly as a fun car and inexpensive garage project. Korff's solution is the Q.P.C., or quick power-plant change. By unbolting the rear subframe/engine unit, the weekend warrior can quickly (about 15 minutes) install something a bit more powerful for the weekend's activities. The complete power train easily unbolts at the firewall, so the car can serve a dual purpose with a minimum of expense. It is a rather unique solution to the common problem of budget competition, and should find a welcome response from many would-be weekend sports car racers.

Korff's approach to the design problem was one of dedicated seriousness touched with a bit of whimsey. The whole car has been completely engineered on the drawing board. A print exists for every part and assembly, down to the last nut and bolt. The project also meshes nicely with several more advanced design programs Korff now has on the drawing board – many components used on the "K" will be applicable to future projects.

The Mini-K prototype, like all prototypes, will never be completely finished. Korff uses it as a test bed for all sorts of ideas. Much of this first car uses plywood for structural panels where the production versions will use aluminum and fiberglass. Walter's aircraft background and familiarity with sail-plane design gives him an affinity for wood, though he realizes most Americans would pale at the thought of wood in an automobile. The very fact that some of England's fastest racing cars are made of wood or aluminum/balsa-wood sandwich materials is completely unknown here, and has stopped Korff from proceeding farther in this direction, because he feels that glass and aluminum can be exploited to gain equal rigidity. Korff does all his own pattern work and, upon return from the foundry, the castings are all machined in Korff's shop by Slover, who, incidentally, is also one of the best porting specialists in southern California.

Korff's concept in merchandising the Mini-K is unique. The basic chassis will accept a variety of power plants, which are readily available in the form of complete motorcycles (easily financed) anywhere in the country. The prospective Mini-K builder simply removes the necessary components from the new two-wheeler frame, installs them in the basic Mini-K chassis and sells the engineless motorcycle back to the dealer, who can then sell the components easily as "parts." The cash received from the sale of the bare motorcycle frame can then go into purchase of more elaborate components for the Mini-K.

Korff's way of selling either the complete assembly or components only should meet with enthusiastic approval from the backyard mechanic. Anyway you look at it, the three-wheeler merits a second look, and Korff's solution to the fun-car market might be just what thousands are seeking.

People write to

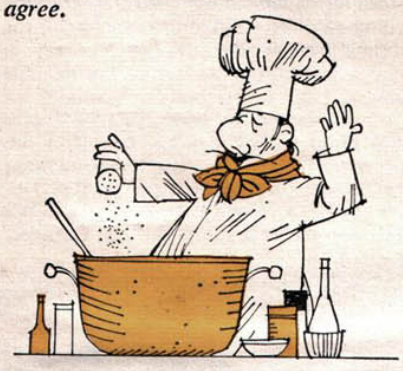
100% Pure Pennsylvania PENNZOIL Safe Lubrication

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

Add 10. I own a 1964 MG Midget. Even after flushing the radiator, my engine still runs a little warm. And after driving a while, my oil pressure drops to 35 pounds. I'm using Pennzoil SAE 30. What should I do?

Cpl. M.L., 29 Palms, Calif.

Go to SAE 40. That's what's recommended by the MG people. And we agree.



You Name It. Does Pennzoil 10W-30 contain additives that are anti-corrosive, rust inhibitive, anti-oxidant and detergent?

D.O.B., Santa Barbara, Calif.

Pennzoil 10W-30 contains detergents, dispersants, anti-wear additive, rust or corrosion inhibitor, oxidation inhibitor, anti-foam additive as well as a viscosity index improver to make it a cross-graded oil.

After 117,000 Miles! I recently rebuilt the engine in my 1956 Oldsmobile which had gone 117,000 miles without an overhaul. It runs fine. But I use up a quart of oil every 2,000 miles. When I checked the oil pan, I found over an inch of very thick sediment in the bottom. What is it?

J.A.H., Springfield, Mo.

Sludge. It probably got there because of moisture condensation or because you drained the oil when it was cold. You might also have a slight cooling system leak that's getting some water into your crankcase. Otherwise, count your blessings!

Motor Bikelet. I am interested in purchasing the smallest size motor to put on my 26 inch bike. Could you recommend one?

F.H., Jr., Lake Ronkonkoma, N.Y.

We recommend you get in touch with a nearby speed shop or engine repair shop. They'll know right away what size engine you need. They might even have one on hand.

Mow Know. I would like to know what kind of oil is best for a Bolens Ride-O-Matic Seven Horsepower Riding Lawn Mower.

V.F., Vandalia, Ohio

Use a quality 20/20W motor oil. Pennzoil Z-7 20/20W should do nicely.

No Castor Oil, Please. I'm going overseas for a year and I have to store my '63 Chevy. Any suggestions? My friend said to change the engine oil to castor oil.

S/Sgt. R.L.J., Beale A.F.B., Calif.

Don't do it. Change the oil, yes. But use a good detergent oil to protect the engine against rust while it sits. It's also a good idea to remove the spark plugs and squirt about one ounce of detergent oil into each combustion chamber. Then replace the plugs but don't run the engine after that. This little squirt will provide lubrication and rust protection to the top ring areas till you come home.

Fractured Block. How can you tell whether an engine block is cracked or not? And if it is cracked, how do you repair it?

T.Z., Miltona, Minn.

The best way to tell whether a block is cracked is to check and see if there is water in the crankcase. That's your best clue. You might as well forget about repairing a cracked block. The best repair is a short block replacement.

Oil Painting. I started driving a 1929 Roosevelt Eight, Five Passenger Sedan when I was 14 years old. I've been an automobile buff since then. But for the longest time, I've wondered why, after an oil change, the oil turns a sort of coral color.

J.B., Waterloo, Iowa

There are, in fact, many factors that contribute to coloration. Premium fuel with a red dye in it can color the oil red. The presence of lead compounds in fuel will color the oil gray. Fuel soot and unburned fuel resins will color the oil black. A combination of these will produce an entirely different oil coloration ... or oil painting, if you like.

At Home Or Away. What oil should I use for (1) my '65 Corvair compact with 110 h.p. engine and (2) my new Lawnboy Rotary Mower 2 cycle engine.

K.J.M., New Hyde Park, N.Y.

Why not try Pennzoil SAE 30. It will work well in both.

WE'RE OPEN TO QUESTIONS about motor oils, lubricants, engines. But, you can tell *us* a few things, too. Maybe you have discovered something interesting about motor oils or lubricants. Or you have a special reason for being a Pennzoil fan. We would like to hear from you. Write to: Pennzoil Company, Research Department, P. O. Box 808, Oil City, Pennsylvania 16301. Note: sorry no pictures or material can be returned. Letters chosen for publication are subject to revision necessary for publication requirements.

The Pure Pennsylvania Motor Oil with Z-7

ask for it!

PROJECT CAR/Part 1 — Body and Chassis

You Can Build A Sports Car!

Sports Car Graphic creates a sports car and, beginning with this issue, we take you through the various stages of development of our high-performance, fiberglass-bodied special. We call it Project Donna, and in subsequent issues you may be in for some startling surprises.

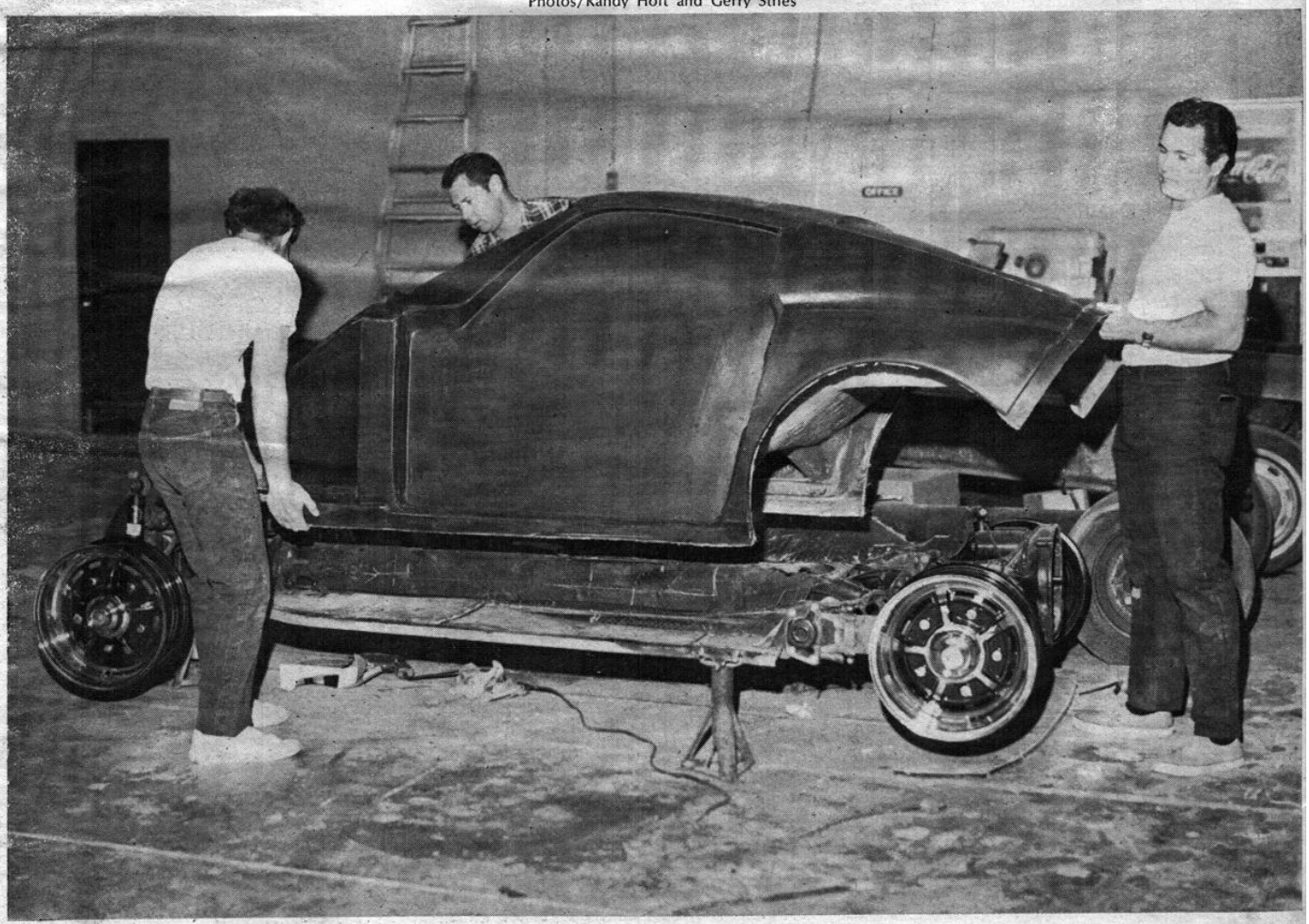
Photos/Randy Holt and Gerry Stiles

THE ONLY TIME ANYONE OFFERS LUSTFUL STARES to Phyllis Diller is when he's stoned out of his mind. Right? So let's take out Phyllis' insides, a common practice nowadays, and transplant them into a mod bod called Raquel Welch. Now you don't have to be stoned to stare, even though it's still Phyllis Diller.

The same applies to automobiles. Put a new body on your Lotus Super 7 and you transform it into a Lamborghini Miura in appearance – even though it's still a Super 7. But who'd know the difference unless you blabbed?

You've seen advertisements in Sports Car Graphic and other magazines showing fiberglass-bodied automobiles with beautiful girls standing alongside. The ads tell how you can convert your car into the girl in the photograph. Right? Wrong. The ads say you can transform your car into the car standing next to the girl, whose body is original equipment and may not be for sale.

So we wanted to know just how one could build such an automobile, and the problems involved. We wanted something a little more special than just a fiberglass shell over a Volkswagen chassis. We wanted to create a sports car that wouldn't



cost a heck of a lot and that could compete, performance-wise, with some of the most expensive sports cars from Europe. And we've done it. Following is the first of a multi-part series on SCG's Project Donna – creating a sports car.

At first we thought of using a light, tube-frame chassis. But that wouldn't work, because we were aiming to build something that would be relatively simple for the fellow who didn't have all the knowledge and equipment necessary for an exotic project. So we picked out easily available and fairly complete Volkswagen components (okay, don't turn up your noses yet), which consisted of floorpan, gas tank, front suspension, steering unit (including steering column), transaxle, and axles. At a junkyard we found what was needed: a wrecked 1964 VW Beetle – these can usually be purchased for something like $200 to $600. We elected to go with an older Volkswagen because later models have shown weaknesses in the newly adopted ball-joint front suspensions.

A readily available fiberglass body was needed for our project, so we contacted Bud Goodwin of Fiberfab in Santa Clara, California. Goodwin has been doing a lucrative business selling his body kits all over the country, and has some of the more startling-looking bodies available. We decided on the Jamaican, a body that can be used on an MGA, Triumph, Austin Healey, or Volkswagen chassis.

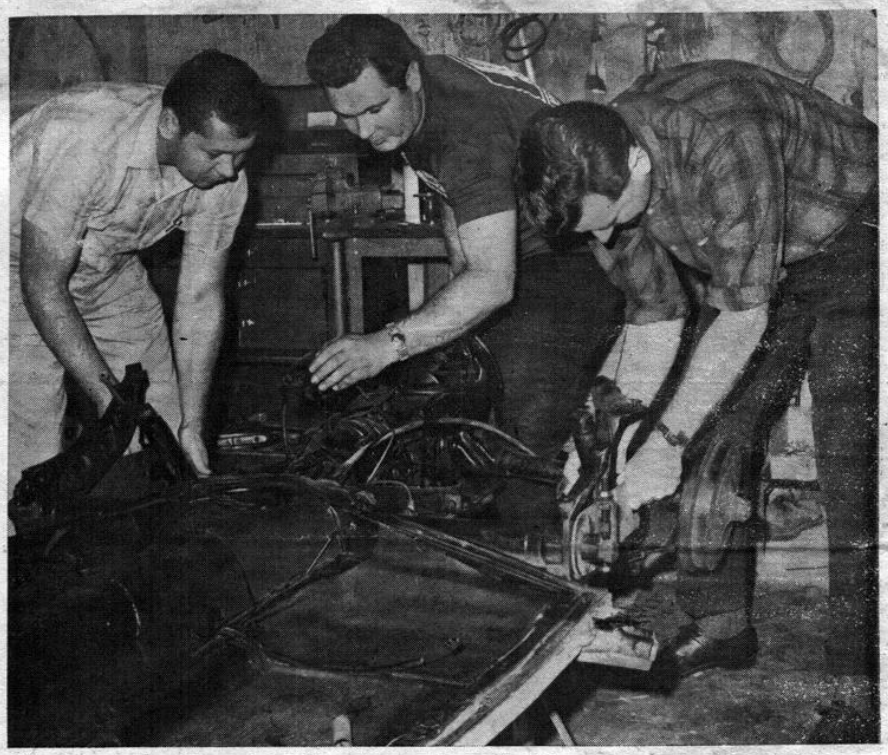
Now we were ready for the first phase of our project, preparing the body and chassis.

It had been a little difficult to locate a VW in the junkyards, simply because there's been such a big rush for this type of vehicle for use not only for fiberglass cars, but dune buggies as well. In fact, many kit builders buy new VW sedans and sell interiors and bodies back to the dealers for something like $800.

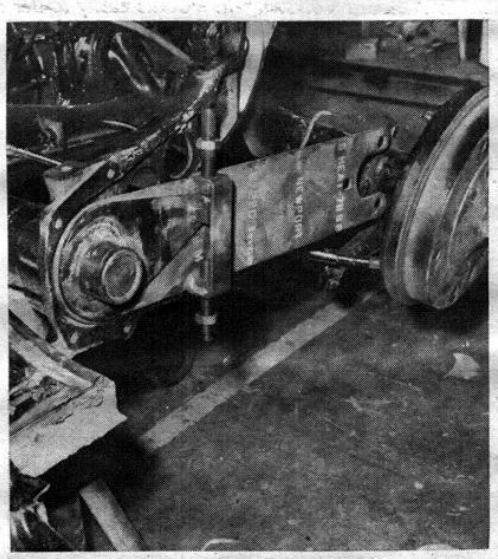
While picking out our junkyard vehicle, the vital components needed for the project were checked carefully to make sure none were damaged beyond use. Once in the garage, the gas tank was drained and battery disconnected. Then the left front wheel was removed and the steering shaft uncoupled. After removing various wires, cables, and fuel lines, the gas tank was unbolted and we were ready to take off the battered body.

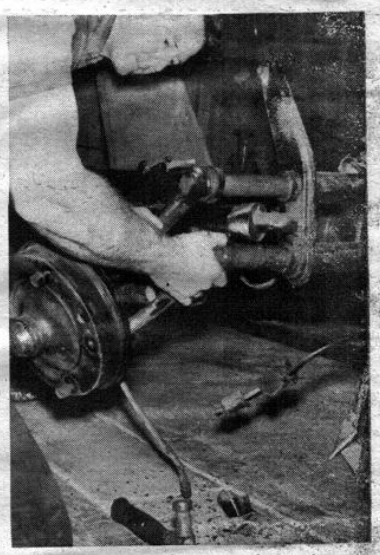
Fiberfab's special projects manager, Rick Figueroa, was most helpful in the entire dismantling and reconstruction of our project car. He had done it so often in the past that he could probably do the whole thing in his sleep.

The interior was stripped out and all body bolts removed. The body bolts had to be retained for reuse later on. The Beetle body was quite heavy and had to be lifted free with a block and tackle and a couple of strong helpers. The Volkswagen's all-steel body accounted for a great proportion of the vehicle's total weight. With a little additional paring, we were aiming for a figure of 1000 to 1200 pounds for our project vehicle – 600 to 800 pounds less



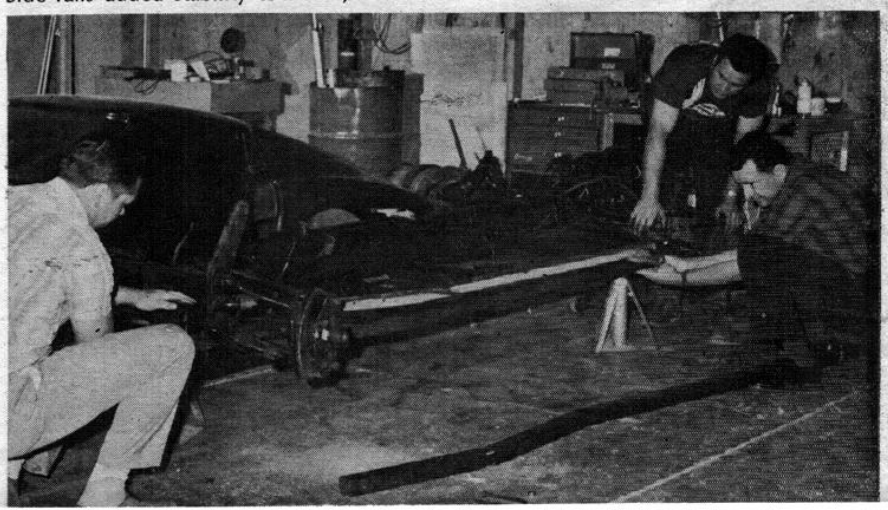
After steam cleaning and painting chassis, transaxle was returned to place as project got underway.

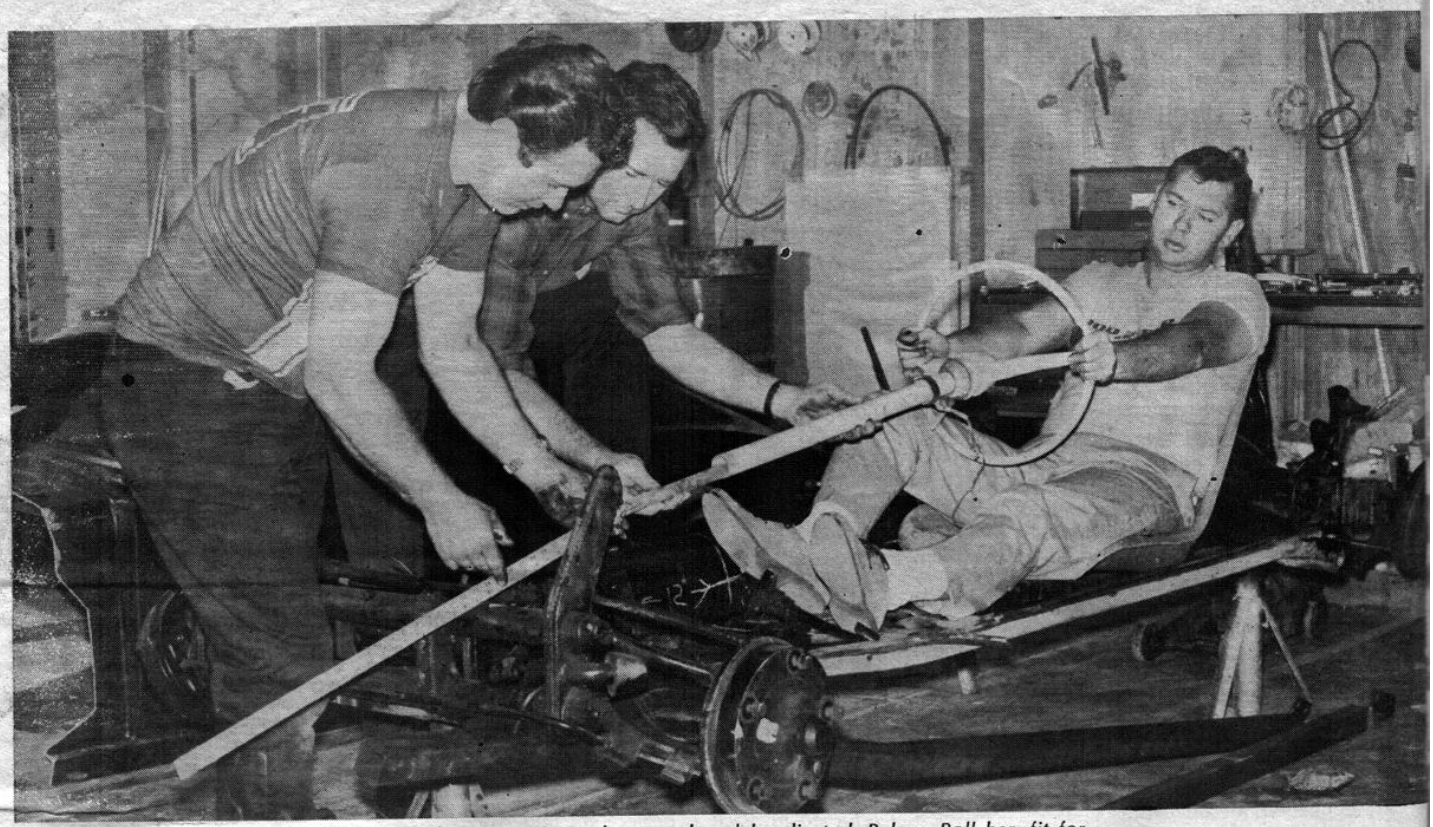




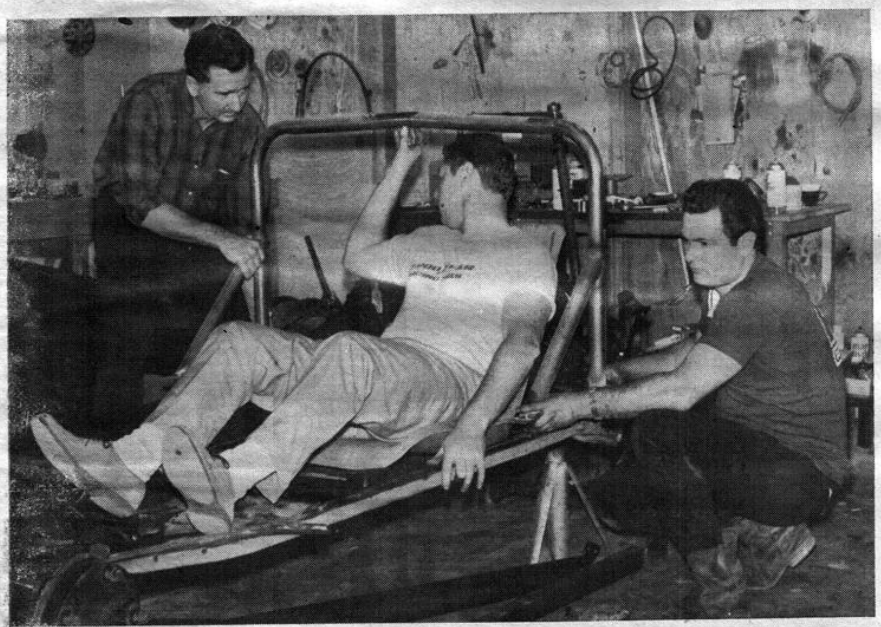
Decambering gave more rear-end stability, above left. Radius arm adjusts with stud and nut. Right, torsion bars were removed to lower car.

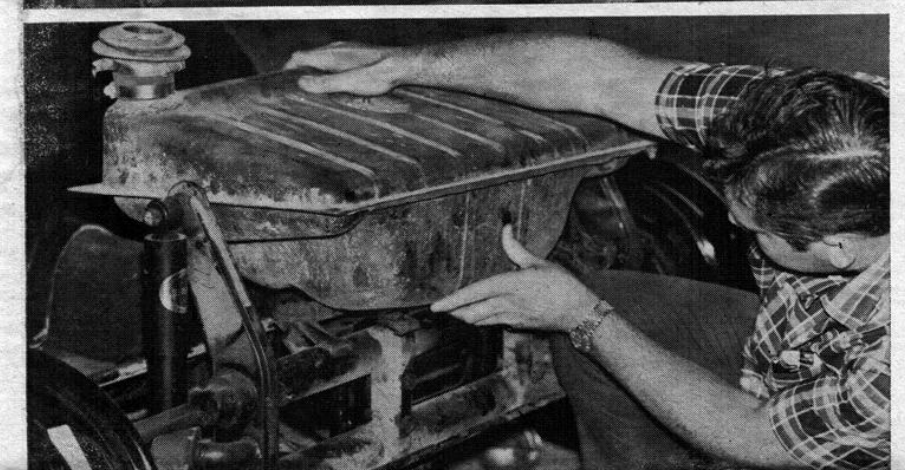
Side rails added stability to frame, below.





Project car was built to accept tall driver. Above, steering column and pedals adjusted. Below, Roll bar, fit for height, to give added safety. Gasoline tank is standard Volkswagen, mounts easily under hood.





PROJECT CAR

continued

than the original car weighed. This would give us a more favorable power-to-weight ratio.

Many builders of Fiberfab cars retain the instruments for later use in the automobile, but we decided on new Stewart-Warner instruments for better accuracy. Besides, the 100-mph speedometer would be useless in the high-speed vehicle we are building.

Now we were ready to clean up the dirty, rusted floorpan. Its appearance was enough to make us want to quit the project, but we knew the final product would turn out good – and this is what kept us going in those early stages.

The floorpan was subjected to a thorough steam cleaning, vacuuming, and rust-removing process. Then it was painted with a black, rust-inhibiting paint.

The next step was to decamber the rear suspension. We weren't too thrilled about using the swing-axle setup from the VW, but it was inexpensive and easily available, so we tried to make whatever corrections necessary. The decambering device we used was of Fiberfab's own design, and was required to compensate for the reduced weight of the fiberglass body. It was completely adjustable so we could set the rear ride height. The decambering device consisted of two radius arms and attachment assemblies. It connected from the rear torsion bar to the axles on each side of the car, and allowed us to alter wheel travel as much as seven inches.

Frame rails were needed to reduce chassis flex, which was one of the functions of

the old VW body. The rails were easily mounted along each side of the chassis and connected, with U-bolts, to the front torsion-bar housing and bolted to the rear torsion-bar dust cover.

We were concerned about nose lift at high speeds with the Jamaican body, so torsion bars in front were reduced by half to bring the nose down. Eight inches were sawed off each end of six of the 12 torsion bars to accomplish this. The same thing can be done just by deactivating one of the two front torsion tubes.

Braking, of course, was a major criteria for our project car. Originally, disc brakes were to be used all around, but for our purposes we felt the added expense wasn't necessary, as you'll see in later stories.

Interior dimensions were marked off at this point. And we used our six-foot Competition Editor, Bob Kovacik, to insure there would be plenty of room inside. Pedals were moved 12 inches toward the rear, and the gearshift lever was pushed back 34 inches. Interior dimensions needed to be changed considerably, because we were transforming a four-passenger VW into a two-seat sports car. A roll bar was checked for fit and we were just about ready to begin mounting the body.

Heavy-duty shock absorbers were furnished by EMPI (Engineered Motor Products, Inc.) of Riverside, California, probably the foremost producer of high-performance Volkswagen accessories and decorative equipment. In this phase, we also used EMPI wheels, steering wheel, and hold-down pins for the body.

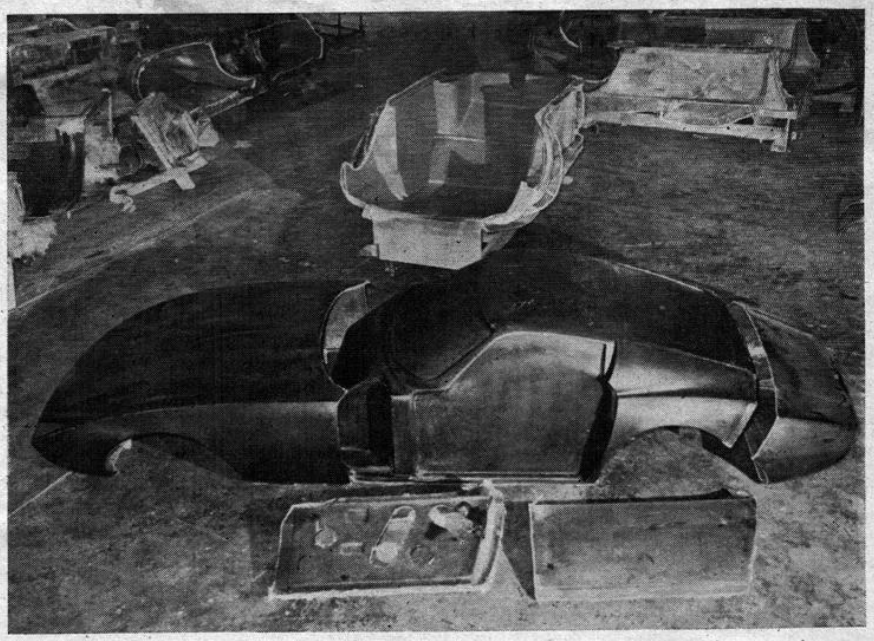
When we began our project, the only Jamaican body Fiberfab had made up to that point was a prototype on an Austin Healey 3000 chassis. It seemed funny that our rear-engined car would have a front-engine body configuration, but not so funny from an aerodynamic standpoint. We felt the body was "slippery" enough to give us speeds to 200 mph, if we wanted to go that fast! Goodwin had new molds made to accommodate the VW chassis – something he would have done soon anyway because of the new sales campaign he had going on the Jamaican.

As we got further into the project, we marveled at just how easy it really was to put together a sports car of this type. Most of the work had already been completed by VW (just a matter of cleaning up, some cutting, and bolting onto the original chassis) and Fiberfab (body was complete, sanded, and almost ready to bolt on).

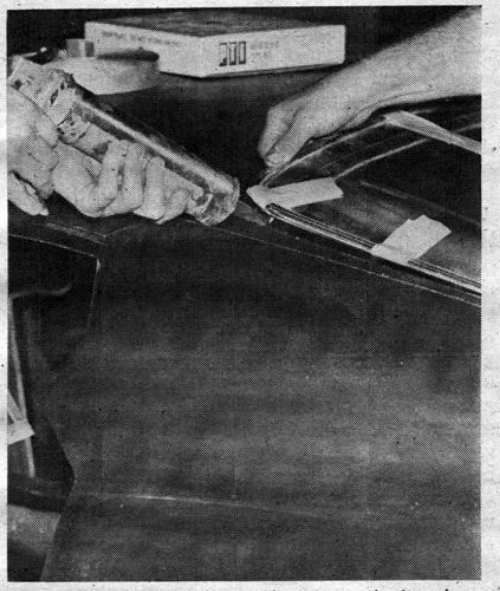
Much of the hardware used in the body was Volkswagen. Headlight and taillight assemblies were VW, as was side glass, door and window mechanisms, and weatherstripping. The only "alien" parts used were a Corvette windshield and Porsche rear window. So what we had so far was a Beetle with a new body. But it sure didn't look like a Beetle – and that was encouraging.

When we pulled the five fiberglass sections out of their molds, we were happy to find they were as light as had been anticipated.

A hole saw was used to cut an opening for the steering column before the body was placed on the floorpan. The center section, or cockpit, was placed on first. Then the enclosed window and door openings were cut out. Now the center section



The first body out of a new mold. It consists of five pieces, including the two doors.



Cutting out windows and doors, above left, is quick procedure. Glass is easily fitted, right, with use of adhesives. Interior doesn't look like much now, below, but will be padded, carpeted.

PROJECT CAR

Continued

was ready to be bolted in place. With the aid of a light held under the floorpan, mounting holes were easily located and the fiberglass drilled through. This is one of the big advantages of a Fiberfab body, in that separate mounting areas don't need to be made. It's just a matter of bolting onto the original chassis. This is engineered into every body the company puts out, making it as easy as possible for the builder.

With some drilling, the nose section of the Jamaican was mounted to existing components. However, the rear, which opened to the engine, needed a separate sub frame so it could pivot up and down for easy access.

Ducts just behind the side windows were opened to get more air for cooling to the engine.

The remainder of the project took the most time. We wanted to get as much quality as possible into our new sports car, so we spent a lot of time sanding and making sure the fits were the best possible. Then there was the time-consuming job of locating the door and window mechanisms, installing wires and the Stewart-Warner instruments.

The interior consisted of fiberglass jump seats, fitted with a padded vinyl cover built by Fiberfab. Floors were carpeted, as was the parcel shelf behind the driver.

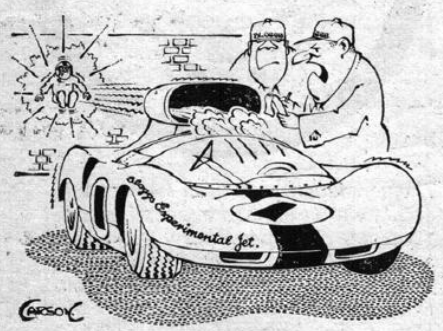
Front and rear glass were installed easily. An auto glass tape kit furnished us with the initial adhesive to keep the glass in place, while a quick-drying cement was later squirted over the tape for the final bonding.

Project Donna was finally taking shape. As we stood back and admired the black, unpainted vehicle, we couldn't help but say how glad we were that we didn't quit after seeing that ugly, archaic-looking floorpan at the start.

We're going to take you through phases that are more detailed later in this series. EMPI is building a whale of an engine for us, which should be able to take Project Donna to speeds equaling that of a Ferrari. So far, our expenditures are around $1000. And, if you're to do a similar project and stick with a fairly stock setup, you can come up with a vehicle that costs you in the vicinity of $1200 or less if you do the work yourself.

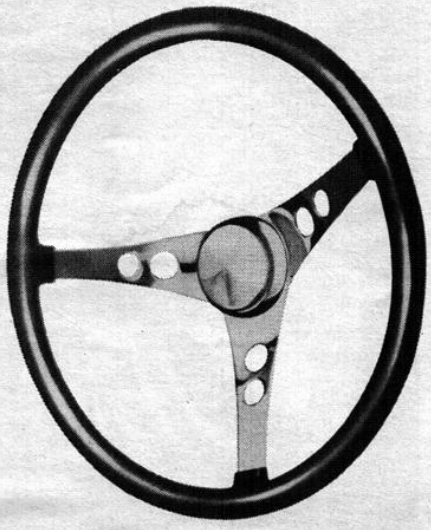
We wanted to go further, however. We wanted to know *exactly* what could be done to make a fiberglass-bodied VW perform like a high-priced sports car.

(Next month: Engine and transmission)



"Fix guard over intake!"

new products



Custom '500' steering wheels have a 2 7/8-inch standard dish in 13 and 14 1/2-inch diameter vinyl rims. For details on these and other custom wheels, write Superior Industries, Dept. G, 14721 Keswick St., Van Nuys, Calif. 91405.

Builders of competition vehicles of all kinds will find the new Race Car Hardware 1968 Discount Catalog *abundant with hard-to-find goodies. Send 50 cents for your copy to Race Car Hardware, 3115 University Ave., Dept. G-21, San Diego, California 92104.*

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

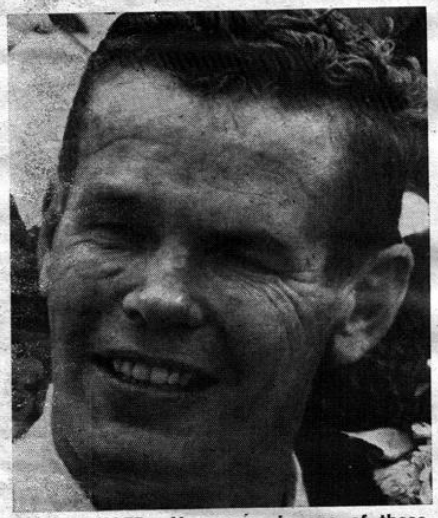
COMPETITION/INDY WRAP-UP/by Don Grey

OFFENHAUSER'S REVENGE

A venerable engine got home first, the crowd choked, while the turbines croaked

PRE-RACE COMMENT

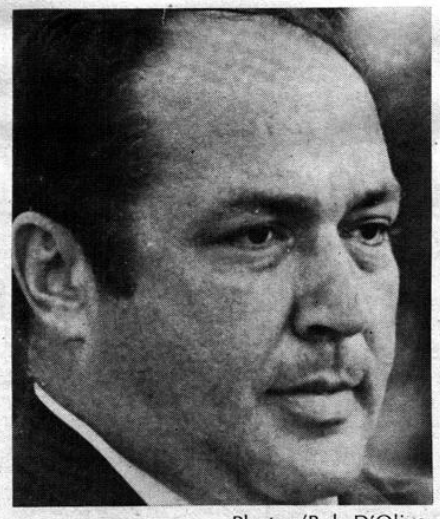
THERE WAS ONE BIG MISTAKE MADE AT INDIANAPOLIS THIS YEAR. That was on May 1, when it was announced over the public address system: "Gentlemen, the track is now open for practice." From that moment, The Greatest Spectacle in Racing degenerated into a month-long tragi-comedy. The plot was simple; it was Andy Granatelli versus the USAC establishment – the turbines versus the piston-engined cars. There were various sub-plots, among them the sudden withdrawal of the Shelby turbines, and Ford's desperate but futile attempts to make its turbocharged engine reliable. There were the tragic moments – the death of Mike Spence and a paralyzing injury to Bob Hurt. There were also the comical moments – as when inspectors from the Weights and Measures Division of the Indiana State Board of Health found the Speedway's scales to be as much as 190 pounds in error. They handed their report to USAC marked CONDEMNED, and two minutes later a car was wheeled onto the scales for its post-qualification weigh in. Throughout all this, the drama was interrupted by almost continuous rain, which had the doubly adverse effect of drastically cutting down on practice and giving everyone even greater opportunities for swapping rumors and stirring the murky waters. Surprisingly, in spite of everything, the 52nd annual Indianapolis 500 was the most exciting race the old Brickyard has produced in many years.



BOBBY UNSER – He won . . . in one of those old, obsolete, slow, piston-engined cars.

The USAC/Granatelli feud began last year when Parnelli Jones drove the original STP Turbocar to within 7½ miles of victory. USAC, under great pressure from some of its established car owners to ban the turbines (the rear-engine revolution was expensive enough for one decade), resisted the impulse, but did impose restrictions on turbines in an attempt to make them equivalent to piston engines. Granatelli cried foul and took USAC to court. He lost his case, but picked up even more public sympathy. For three weeks in court, Granatelli had argued that there was no way a turbine car could be competitve with its air inlet reduced from 23.999 to 15.999 square inches. The day after testimony ended, however, and ten days before the judge ruled against him, Granatelli unveiled the new STP-Lotus turbines at the Speedway. The now famous Flying Wedge (Lotus Type 56) is a superb product from the fertile minds of Colin Chapman and Lotus chief designer Maurice Phillippe. The top, bottom, and both sides are almost perfectly flat, the wedge shape being chosen because it has good penetration, low drag, and excellent anti-lift characteristics. The chassis is a full monocoque structure made mainly of 16 s.w.g.

ANDY GRANATELLI – He lost . . . again . . . even with three new, sleek, modern, aerodynamically correct, turbine-powered cars.



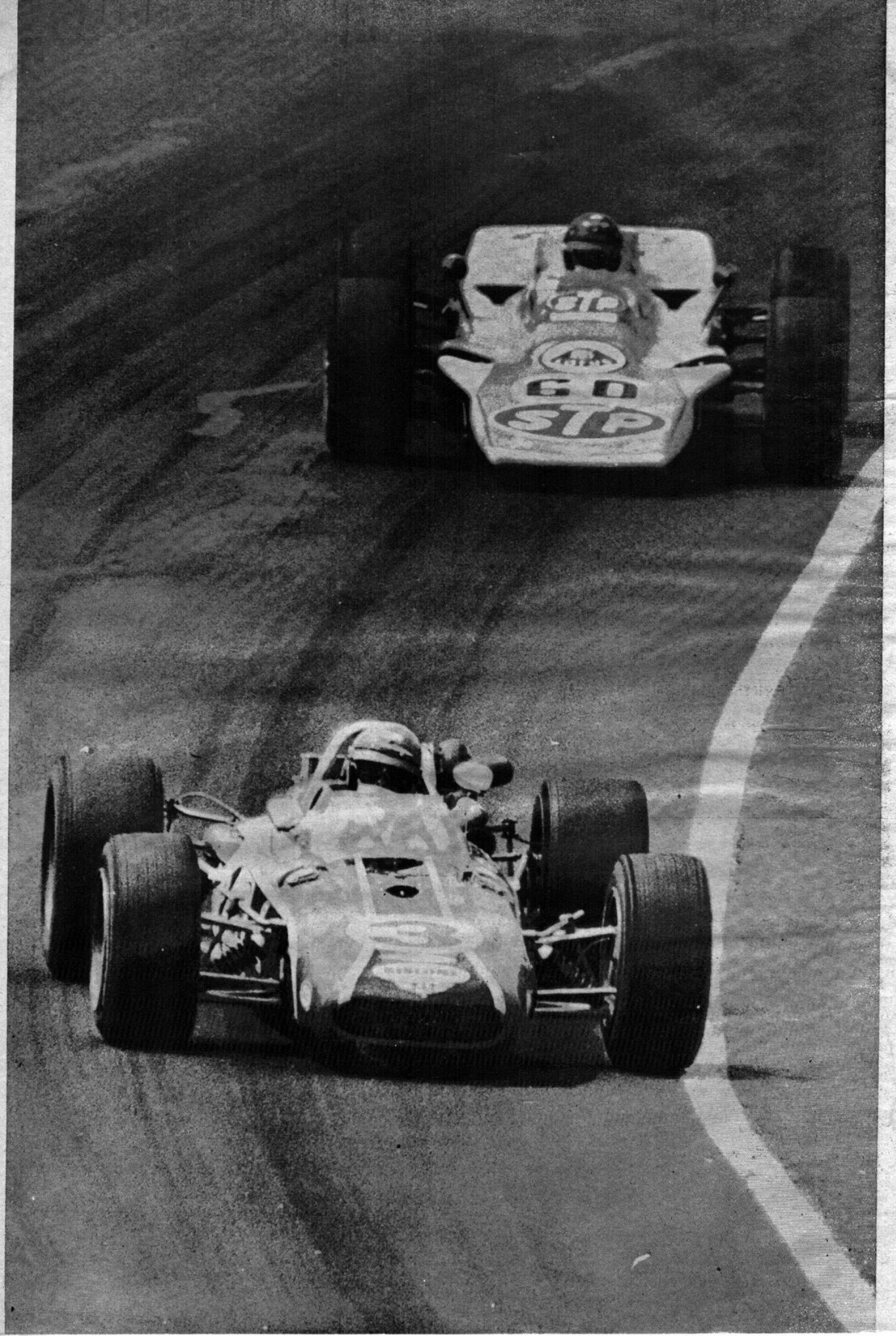
Photos/Bob D'Olivo

aluminum alloy. Unlike the original STP Turbocar, which has the engine and driver in a side-by-side configuration, the Lotus has its Pratt & Whitney Series 70 engine behind the driver. The basic engine, manufactured by United Aircraft of Canada, is a more powerful version (100 hp increase) of the Series 60 ST6 engine used last year. However, in order to meet the USAC inlet restrictions, the first two axial stages of the compressor have been removed and the third axial stage has been reduced in size. Since the reduction was over one-third, the power output was obviously cut substantially, but by how much no one was willing to say – until after the race.

The whole car is an excellent example of ingenious yet simple and highly practical design, and nothing typifies this more than the suspension. Since all four wheels are the same size and have almost identical function – apart from steering – they have similar hub carriers and a common suspension system of upper and lower wishbones, although the lower front wishbones differ from the rears to allow steering clearance. At all four corners, a cantilevered extension of the upper wishbone supports inboard-mounted concentric spring/shock units and the anti-roll bars. The ventilated Girling discs are also mounted inboard, with just enough of the disc sticking up into the air stream for cooling.

While the Lotus turbines attracted the most attention, they were not the only new cars at the track. Most numerous of the newcomers were the five "second generation" Eagles, all of which made the race. Actually, these are a completely new design by Tony Southgate, ex of Lola. Lower and slimmer than the previous model, they have also been made more simple by moving the concentric coil/shock units back out into the airstream. Jack Brabham, on the other hand, long a holdout for tubular space frames and exposed coil/shocks, was going the other way – to a semi-monocoque tub, the engine still in a tubular subframe, and inboard, cantilevered coil/shocks. Brabham also had an all-new Repco V-8 engine, commissioned by Goodyear, with two gear-driven overhead cams per bank and four valves per cylinder.

Problems in fuel distribution, overheating, and fuel consumption also plagued efforts to make the new turbocharged Ford engine reliable. A.J. Foyt tried one in his Coyote, but abandoned it in favor of a standard Ford four-cammer (as he also abandoned a special Ford automatic transmission). Mario Andretti (new monocoque Hawk), Jerry Grant (new Eagle), Arnie Knepper and Jim Malloy (both in Vollstedts), and Al Unser all stuck with the turbo-Ford for the race, but all were out by the halfway mark (although only two of them as a result of engine failure). Unser's car was one of two new Eric


STP
STP

INDY WRAP-UP

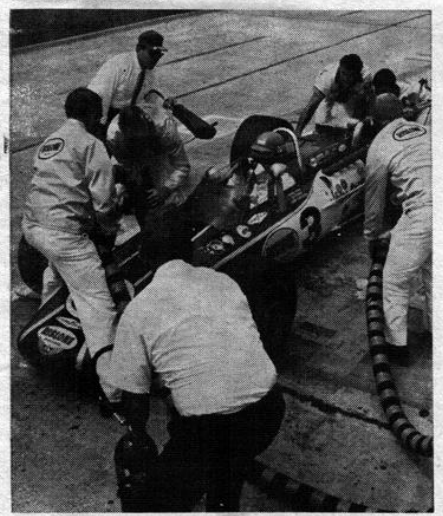
Continued

Broadley Lolas that can be converted, via a special Hewland transmission, to four-wheel drive. Unlike the cars designed specifically for 4 w.d., the Lola used larger tires at the rear than at the front.

The first half of the month was a series of disasters for the Granatelli/Chapman combine: Parnelli Jones stepped out of the original STP Turbocar, saying the inlet area restrictions made it uncompetitive. ("I race to win, and I don't think I can win with this car except for a fluke. I don't depend on flukes."); Mike Spence, after going over 169 mph in his Lotus turbine, took teammate Greg Weld's car out for a shakedown, went too high into the first turn and crashed broadside into the wall. He died four and one-half hours later without regaining consciousness; a USAC technical committee found no evidence of any mechanical failure, but did find that the Lotus suspension parts were not made of the material specified in the USAC rules. ("Let me emphasize that we are not implying the parts are unsafe," said Chief Stewart Harlan Fengler, "but they do not meet our specifications and will have to be changed." They were changed.); Art Pollard and Joe Leonard got the STP Turbocar up to 166 mph, but then Leonard made a museum piece out of it when he spun into the wall; finally, what was thought to be a sprain in Jackie Stewart's right wrist turned out to be a hairline fracture, and five days before qualifying, the STP team was down to just one of its nominated drivers – Graham Hill.

The already tense situation wasn't helped when Carroll Shelby decided to use Spence's crash to cover the withdrawal of his three turbine cars, saying: "After complete and intensive testing, I feel at the present time it is impossible to make a turbine-powered car competitive with a reasonable degree of safety and reliability." Issued only two hours after Spence's death, Shelby's statement caused considerable annoyance to the STP-Lotus-Firestone camp, because it appeared to refer to *all* turbine cars rather than his entries specifically. The statement also skirted the fact that his cars – designed by Ken Wallis (ex of STP), bankrolled by Goodyear ($1.5 million), and powered by GE turbines – were grossly overweight, had inadequate braking, and the handling gave drivers Bruce McLaren and Denny Hulme the shivers. In a word, uncompetitive. (Hulme moved over to Gurney's Eagle nest, but McLaren was left without a drive.)

Unser's pit stops weren't especially fast, but his turbo-Offy Eagle made the trip with few troubles.



Despite the setbacks that would have driven lesser men to tiddlywinks, Granatelli still clung to his dream of an Indy victory. Graham Hill, after all, had driven his car over 169, and sure enough, on May 18, Hill became the first qualifier for the 1968 race with a new one-lap record of 171.887 mph and a new four-lap average of 171.208. A few hours later, Leonard brought the dream even closer when he erased Hill's marks and put his STP-Lotus on the pole with a new one-lap record of 171.953 and a new four-lap average of 171.559. Coming so early in qualifying, however, Hill's performance completely demoralized the piston-engined brigade, and, with one exception, they gave up, content simply to make the race. The exception was Bobby Unser, who two days earlier had become the first driver ever to lap the Brickyard at over 170 mph. Taking his Rislone Eagle out on an already oily track, Unser wound the turbo-Offy to its peak, and posted a one-lap high of 170.358 and a four-lap average of 169.507 to win the remaining spot on the front row.

Twelve more drivers qualified that first day, most of them veterans, but none of them having a go at even Unser's speed, let alone that of the turbines. Bucknum was one of six road-racing drivers in the field, joining Hill, (STP-Lotus turbine), Gurney (Gurney-Weslake Olsonite Eagle), Jerry Grant (turbo-Ford Bardahl Eagle), Rindt (Repco Brabham) and Hulme (Ford Olsonite Eagle). The road racers that didn't make it included Masten Gregory, former SCG Editor Jerry Titus, George Follmer, and Rick Muther, and it was more for lack of first-class equipment than of trying that they weren't in the field.

THE INDY RACE.

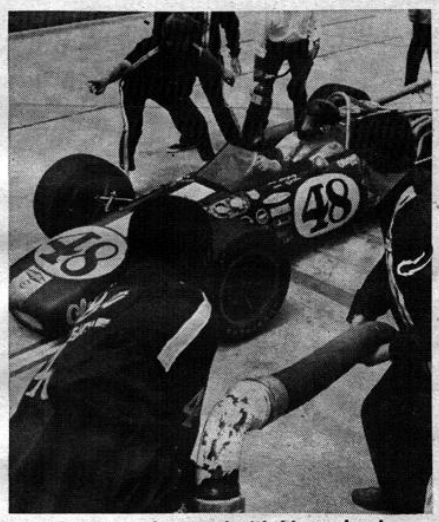
With two of the seemingly invincible STP-Lotus turbines on the front row and a third, driven by Art Pollard, lurking in the fourth row, it came as no great surprise to anyone when Joe Leonard swooshed into the lead from a ragged but accident-free start. Nor was anyone surprised when the turbine pulled away and rattled off the first ten miles at 162.338 mph – almost ten mph faster than Jimmy Clark's 1964 record. But a quarter of a million fans – and probably Joe Leonard – sure were surprised on the eighth lap when Bobby Unser's Eagle, its turbo-Offy screaming, swept down the front straight, swallowed up the turbine, and shot into the lead.

"My Gawd, Emily, there's going to be a race after all!"

You bet your restricted inlet areas there was, and the fickle fans, after supporting the turbines most of the month, began rooting for the piston-engined challengers. While Unser and Leonard dueled for the lead, Roger McCluskey (turbo-Offy Eagle), Gordon Johncock (turbo-Offy Gerhardt) and Lloyd Ruby (turbo-Offy Mongoose) scrambled for third. Hill's turbine occupied a lonely but strategic sixth, and then followed another wheel-to-wheel battle involving Al Unser's four-wheel-drive Lola, A. J. Foyt's Ford Coyote, Pollard's turbine, Gurney's stock-block Eagle, Jerry Grant's turbo-Ford Eagle, and Jim McElreath in one of Foyt's Ford Coyotes.

Al Unser brought on the first yellow caution light of the race when his Lola lost the right front wheel on the 41st lap, and he crashed broadside into the first-turn wall. He was uninjured, but wreckage from his car knocked out Arnie Knepper's turbo-Ford Vollstedt and Gary Bettenhausen's turbo-Offy Gerhardt. The green light flashed again on the 52nd lap, and over the next four laps the three leaders made the first of their three compulsory fuel stops.

Ruby's was the quickest, and on the 57th lap he shot to the front for the first time. At the 200-mile mark 23 laps later, he was still there, but with Bobby Unser only 2.3 seconds back in second and Leonard 1.0 second farther back in third. Hill occupied fourth, 15.6 seconds behind his teammate, but 11.2 seconds clear of a really classic battle between Gurney and Foyt. These two former Le Mans partners had locked horns before the 20th lap, and 150 miles later they were still less than a second apart, slipstreaming each other down the straights and diving into the corners side by side as only two old pros would dare. Unfortunately, the duel ended on the 87th lap when a connecting rod let go in Foyt's Coyote. Three laps later, however, the battle at the front picked up as first Unser and then Leonard swept past Ruby.



Dan Gurney took second with his pushrod Ford-powered Eagle.

Eleven laps into the second half, Hill's race ended when he felt a vibration in the rear of his STP-Lotus turbine, and the car spun 180 degrees and clouted the wall in the second turn. Unser pitted under the resulting yellow, handing the lead to Leonard, but when the green flashed on the 119th lap, the Eagle rocketed past the turbine and combat was resumed again. After three hundred and fifty miles of the race, there was still only two seconds separating the first three cars, and the crowd roared as the turbine mounted attack after attack on Unser, only to be turned

back. As Leonard explained later, he lacked one vital weapon – horsepower. The turbine has tremendous low-end torque and Leonard could beat the turbo-Offies coming out of the turns, but halfway down the 3,300-foot straights, the turbochargers built up to peak efficiency, giving Unser and Ruby over 650 hp with which to overhaul the turbine. Leonard said the turbines had been tweaked to give 510 hp for qualifying, but had been detuned to as little as 430 hp by the warm, sunny weather and the hot exhaust gasses the turbine swallowed as it followed the turbo-Offies. (More than once Leonard was forced to stop slipstreaming Unser and move out into cooler air because his temperature gauge was in the danger zone.) The power difference was even more evident in traffic, where Leonard got trapped by slower cars and Ruby slipped past into second place.

Coming up to three-quarter distance (150 laps) and the final fuel stops, Unser led Ruby by a hair, with Leonard five seconds back and Gurney fourth, ten seconds behind the turbine. Hulme had long since advanced his Eagle to fifth behind his teammate, with Mel Kenyon's turbo-Offy Gerhardt sixth and Pollard's turbine seventh. Ruby and Leonard made their stops first and then shot to the front, one second apart, when Unser made his third and final stop on the 166th lap. It was a long stop for Unser (27 seconds), made even longer by the fact that he had been stuck in 4th gear since his first stop and had to slip the clutch as he left the pits with a full load of fuel.

On the 175th lap, with a slim but measurable lead over Leonard, Ruby suddenly lost a great chance for victory when he slowed, pitted twice with a misfiring engine, and then lost 6 minutes 29 seconds having an ignition coil changed. The quiet, veteran Texan had driven brilliantly – he had the fastest race lap at 168.666 mph – and would almost certainly have retired had victory not eluded him.

Ruby's stop vaulted Leonard into the lead for the third time, and on the 181st lap he appeared to have the race locked up – he was seven seconds ahead of Unser – when the yellow light flashed on as Carl Williams' Coyote hit the wall in the second turn, lost a wheel and caught fire. For ten laps the field bunched up behind Leonard, and it seemed impossible that Unser, with five cars separating him from the leader, could ever hope to catch him. Then, of course, it happened. For the second year in a row, with a turbine victory within his grasp, Granatelli saw his dream shattered. The green light flashed on the 191st lap, Leonard punched the throttle – and nothing happened. Leonard threw one hand in the air, pulled sharply to the side of the track, and parked in the first turn. Unser roared past, taking the lead for the fourth and last time on his way to victory in one of the most exciting 500-mile races in many years.

Moments later, Pollard's turbine, too, suddenly flamed out and died, the victim, like Leonard's car, of a sheared fuel-pump drive shaft. Hulme also suffered misfortune after a fine drive, when he pitted with a flat tire on the 198th lap, and lost third place to Mel Kenyon.

Bobby Unser took the checkered flag to a tremendous ovation from the crowd, his Rislone Eagle completing the race at the record average of 152.882 mph. It was a victory worth over $175,000, and brought the venerable Offenhauser back to Victory Lane for the first time since 1964. Gurney, too, received a roaring welcome from the crowd as he brought his Olsonite Eagle home in second place, 54 seconds behind Unser. Mel Kenyon's Gerhardt, Denny Hulme in the second Olsonite Eagle, and Lloyd Ruby's Mongoose went on to complete 200 laps and finish third, fourth and fifth. With Eagles in three of the first four places, Gurney was jubilant – the more so because his pushrod Gurney-Weslake engine had scored the highest by a stock-block engine since the early days of the race. Eleven of the 33 starters were running at the finish, Billy Vukovich taking Rookie of the Year honors after starting 23rd and finishing seventh.

1968 INDIANAPOLIS 500
Indianapolis, Indiana
(200 laps, 500 miles)

STARTING GRID

Joe Leonard Lotus-P & W Turbine 171.599 mph	**Graham Hill** Lotus-P & W Turbine 171.208 mph	**Bobby Unser** Eagle-Turbo-Offy 169.507 mph
Mario Andretti Hawk-Turbo-Ford 167.691 mph	**Lloyd Ruby** Mongoose-Turbo-Offy 167.613 mph	**Al Unser** Lola-Turbo-Ford 167.069 mph
Roger McCluskey Eagle-Turbo-Offy 166.976 mph	**A. J. Foyt** Coyote-Ford 166.821 mph	**Gordon Johncock** Gerhardt-Turbo-Offy 166.775 mph
Dan Gurney Eagle-Gurney-Ford 166.512 mph	**Art Pollard** Lotus-P & W Turbine 166.297 mph	**Wally Dallenbach** Finley-Turbo-Offy 165.548 mph
Jim McElreath Coyote-Ford 165.327 mph	**Jim Malloy** Vollstedt-Turbo-Ford 165.032 mph	**Jerry Grant** Eagle-Ford 164.782 mph
Jochen Rindt Repco-Brabham 164.144 mph	**Mel Kenyon** Gerhardt-Turbo-Offy 165.191 mph	**Bud Tingelstad** Gerhardt-Turbo-Offy 164.444 mph
Ronnie Bucknum Eagle-Ford 164.211 mph	**Denis Hulme** Eagle-Ford 164.189 mph	**Johnny Rutherford** Eagle-Ford 163.830 mph
Gary Bettenhausen Gerhardt-Turbo-Offy 163.562 mph	**Bill Vukovich** Shrike-Turbo-Offy 163.510 mph	**Bobby Veith** Gerhardt-Turbo-Offy 163.495 mph
Bobby Grim Mongoose-Turbo-Offy 162.866 mph	**Ronnie Duman** Hayhoe-Turbo-Offy 162.338 mph	**Mike Mosley** Watson-Turbo-Offy 162.449 mph
Carl Williams Coyote-Turbo-Ford 162.323 mph	**George Snider** Mongoose-Ford 162.264 mph	**Jim Hurtubise** Mallard-Turbo-Offy 162.191 mph
Sam Sessions Finley-Turbo-Offy 162.118 mph	**Arnie Knepper** Vollstedt-Turbo-Ford 161.900 mph	**Larry Dickson** Hawk-Ford 161.124 mph

RESULTS

Pos.	Driver	Car	Laps
1.	Bobby Unser	Eagle-Turbo-Offy	200
2.	Dan Gurney	Eagle-Gurney-Ford	200
3.	Mel Kenyon	Gerhardt-Turbo-Offy	200
4.	Denis Hulme	Eagle-Ford	200
5.	Lloyd Ruby	Mongoose-Turbo-Offy	200
6.	Ronnie Duman	Hayhoe-Turbo-Offy	199
7.	Bill Vukovich	Shrike-Turbo-Offy	198
8.	Mike Mosley	Watson-Turbo-Offy	197
9.	Sam Sessions	Finley-Turbo-Offy	197
10.	Bobby Grim	Mongoose-Turbo-Offy	196
11.	Bobby Veith	Gerhardt-Turbo-Offy	196
	Not running at finish		
12.	Joe Leonard	Lotus-P & W-Turbine	191
13.	Art Pollard	Lotus-P & W-Turbine	188
14.	Jim McElreath	Coyote-Ford	179
15.	Carl Williams	Coyote-Ford	163
16.	Bud Tinglestad	Gerhardt-Turbo-Offy	158
17.	Wally Dallenbach	Finley-Turbo-Offy	146
18.	Johnny Rutherford	Eagle-Ford	125
19.	Graham Hill	Lotus-P & W-Turbine	110
20.	A. J. Foyt	Coyote-Ford	86
21.	Ronnie Bucknum	Eagle-Ford	76
22.	Jim Malloy	Vollstedt-Turbo-Ford	67
23.	Jerry Grant	Eagle-Ford	50
24.	Gary Bettenhausen	Gerhardt-Turbo-Offy	43
25.	Arnie Knepper	Vollstedt-Turbo-Ford	42
26.	Al Unser	Lola-Turbo-Ford	40
27.	Gordon Johncock	Gerhardt-Turbo-Offy	37
28.	Larry Dickson/ Mario Andretti	Hawk-Ford	24
29.	Roger McCluskey	Eagle-Turbo-Offy	16
30.	George Snider	Mongoose-Ford	9
31.	Jim Hurtubise	Mallard-Turbo-Offy	9
32.	Jochen Rindt	Repco-Brabham	5
33.	Mario Andretti	Hawk-Turbo-Ford	2

Race time: 3 hrs., 16 mins., 13.76 secs.

Winner's average speed: 152.882 mph, new record (old record 151.207 mph, A. J. Foyt, Coyote-Ford, 1967).

Fastest race lap: 168.666 mph, Lloyd Ruby, new record (old record: 164.926, Parnelli Jones, STP Turbo-car, 1967).

Lap leaders: Leonard, 1-7; B. Unser, 8-56; Ruby, 57-89; B. Unser, 90-112; Leonard, 113-119; B. Unser, 120-165; Ruby, 166-174; Leonard, 175-191; B. Unser, 192-200.

MONACO GRAND PRIX

Continued from page 20

had to shoot off to Indianapolis, which didn't exactly help.

Denny's return-trip schedule was something bordering on the strip cartoon. After qualifying in the final minutes at Indy, just before 4 p.m. on Saturday, he posed for the usual publicity pictures, then jumped into a chopper, which lifted him to Indianapolis airport. From there he was transported at a great height and speed to New York airport, the pilot taxiing his Lear jet alongside the TWA Boeing 707 which was about to leave for Milan. Arriving in Italy the following morning, he found a Cessna 411 already warmed up and waiting to carry him to Nice airport, strike-bound though it was, like the rest of France, and from Nice, Teddy Mayer drove the world champ the remaining few miles back to Monaco in a Peugeot 404. He was back in the principality by 10 a.m. local time! He said he felt fine, but he was sensible enough to take things steadily, gradually moving up from near the back of the field as, one by one, the opposition dropped by the wayside, until he was third by lap 17. After that, it was just a matter of conserving his position, until that driveshaft went again, and precious minutes between him and those world championship points all but disappeared.

BRM had a bewildering week leading up to the race. First, they had to shelve their plans to drive straight from Spain to Monaco, because Rodriguez's shunt at Jarama meant either a rebuild or a replacement car from the factory (it turned out to be a replacement). Then, they had another driver upset when Chris Irwin, who was to join the team for this one race pending the arrival of his Honda, had his Nurburgring accident. Piers Courage had decided to remain with Tim Parnell and his basically similar BRM, so Dickie Attwood was invited to take over the late Mike Spence's car. And what a brilliant job he did with it, too.

Attwood was third fastest on the first day of practice despite an understeering problem, fifth fastest on the second day, and fifth again on the third day without attempting to go fast. Before the race, he was honest enough to say that his car was then handling perfectly, that it would outbrake most things on the circuit (the BRMs have the big $13\frac{1}{16}$-inch ventilated discs with large calipers and are almost overbraked), and that he expected it would prove completely reliable, even though, unlike Rodriquez, he was using an engine with cast iron rather than the latest steel liners. He was dead right, too. The car didn't miss a beat throughout the two hours, and although he never once eased the pressure on Hill, he finished the race feeling and looking amazingly fresh —and not many people do that at Monaco!

Attwood and Rodriguez had started the race in sixth and seventh places, but moved up a place at a time when Servoz-Gavin, then Rindt, then Siffert dropped out from their higher positions. By lap 16 they were running third and fourth behind Hill and Surtees (whose gearbox was already playing up), but suddenly Rodriguez went straight on at the Mirabeau Corner, with the rear brakes not working and the fronts locked up. One of the BRM's latest-type wheels, with its greater offset, flew off and floored a marshal, fortunately without damaging him too seriously. Pedro also was unhurt, but the car was a mess.

The third BRM — Piers Courage's early (ex-Tasman) V-12 — was an early pit caller when Courage complained of no rear brakes. A few laps later he was back to report of weird handling, which was then traced to a broken monocoque crossmember and which had caused the original brake failure. Another car out of the race.

The Brabham team made one of the briefest appearances in the race, as it had at Jarama with the same cars. Jack himself had been delayed on his way back from Indianapolis, and missed the first training session. He spent most of the other two systematically sorting out his BT26 chassis rather than going for fast times, while Rindt seemed very content, and was not even bothered when he brushed the barrier along the back of the pits during final practice, which is more than could be said of those who were leaning against it at the time!

But any chance of a Rindt fight to the finish disappeared as early as lap eight, when the Austraian slid on oil going into Mirabeau, and almost went into the Mirabeau Hotel itself. Exit one Repco Brabham. Jack's own car lasted only seven laps, and by the time his teammate was cannoning himself out of fourth place, Brabham was parking his own car at the Station Hairpin with one of the rear radius arms pulled out.

The first European appearance of the 1968 Eagle was equally brief and disappointing. Dan Gurney was using the car he had taken to South Africa in January — basically the 1967 lightweight, but with modified suspension to reduce rear wheel camber change. It also had the first of the Eagle-built V-12 engines, carrying "Eagle Mark 1A" on the cam covers to distinguish it from last year's engines.

The Mark 1A was said to be giving well in excess of 420 bhp at 10,500 rpm, but Gurney had little chance to prove it during the first training session, because it broke its oil pump and damaged its bearings. This was a real blow because there was no spare, the only other engine being still in its final stages of assembly in England. It was completed the following day, flown out over night, then retrieved from Nice airport (still strike-bound) by a cloak-and-dagger operation, and dropped into the waiting chassis just in time to make the final practice. No fast times were anticipated or obtained, and Dan was aiming to run it in steadily during the first part of the race. But, a sudden lack of sparks on one bank of cylinders sidelined the car after nine laps.

The Cooper team had every reason to feel delighted with its race result, for practice had confirmed once again that they are not competitive on lap times. The only real changes since Spain were tubular metal guards around the Hewland gearboxes, and an oil cooler mounted above the gearbox on Scarfiotti's car. During practice, a drive-shaft failure encouraged the team to replace the shafts with the heavy-duty variety used last year with the Maserati engines. The new shafts certainly

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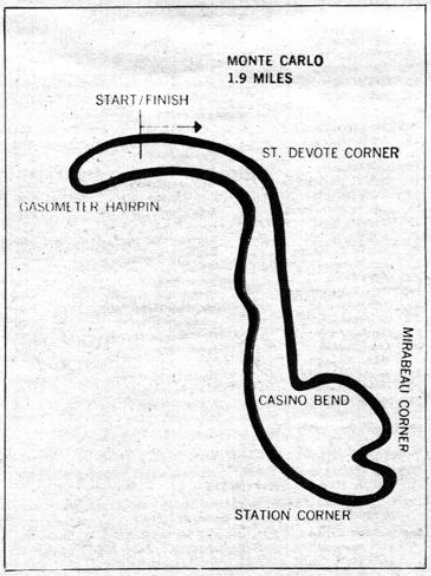
MONACO GRAND PRIX
Monte Carlo, May 26, 1968
80 laps, 156 miles

STARTING GRID

G. HILL Lotus-Ford V-8 1:28.2		J. SERVOZ-GAVIN Matra-Ford V-8 1:28.8	
J. SIFFERT Lotus-Ford V-8 1:28.8		J. SURTEES Honda V-12 1:29.1	
J. RINDT Repco Brabham V-8 1:29.2		R. ATTWOOD BRM V-12 1:29.6	
B. McLAREN McLaren-Ford V-8 1:29.6		J-P. BELTOISE Matra V-12 1:29.7	
P. RODRIGUEZ BRM V-12 1:30.4		D. HULME McLaren-Ford V-8 1:30.4	
P. COURAGE BRM V-12 1:30.6		J. BRABHAM Repco Brabham V-8 1:31.2	
J. OLIVER Lotus-Ford V-8 1:31.7		L. BIANCHI Cooper-BRM V-12 1:31.9	
L. SCARFIOTTI Cooper-BRM V-12 1:32.9		D. GURNEY Eagle V-12 1:32.9	



RESULTS

Pos.	Driver	Car	Laps
1.	Graham Hill	Lotus-Ford	80
2.	Richard Attwood	BRM	80
3.	Lucien Bianchi	Cooper-BRM	76
4.	Ludovico Scarfiotti	Cooper-BRM	76
5.	Denis Hulme	McLaren-Ford	73

Did Not Finish

J. Surtees, Honda, 16 laps, broken gearbox; **P.** Rodriguez, BRM, 16 laps, accident; P. Courage, BRM, 12 laps, broken chassis; J-P. Beltoise, Matra, 11 laps, damaged front suspension; J. Siffert, Lotus-Ford, 11 laps, broken ring and pinion; D. Gurney, Eagle, 9 laps, overheating and misfiring; J. Rindt, Repco Brabham, 8 laps, accident; J. Brabham, Repco Brabham, 7 laps, detached radius arm; J. Servoz-Gavin, Matra-Ford, 4 laps, damaged rear suspension; B. McLaren, McLaren-Ford, 0 laps, accident; J. Oliver, Lotus-Ford, 0 laps, accident.

Winner's average speed: 77.82 mph.

Fastest race lap: Richard Attwood, 1m 28.1s, 79.85 mph, new record (old record: Jim Clark, Lotus-Ford V-8, 1m 29.5s).

did a good job, the only unforeseen troubles for much of the race being what sounded like a broken valve on Bianchi's engine, and at least three of them on Scarfiotti's, which sounded so sick from quarter-distance on that it was amazing it kept going to the finish.

Jo Siffert really shone in Rob Walker's Lotus-Ford 49 during practice, although he managed to get through two ring-and-pinion assemblies in the course of setting equal second fastest time. A switch to the heavier steel transaxle side plates, it was hoped, would prevent a repeat of the trouble during the race, but after running second to Hill for ten laps (to the delight of Walker, for whom Stirling Moss had won this race back in 1961), poor Siffert felt his transmission go for the third time, and he parked the car near the chicane.

This was John Surtees' opportunity to take over the chase of Hill with the Honda RA301, which had been seen for the first time in Spain. That the V-12 engine was delivering real power and torque was indicated by several rear-end problems which occurred during practice. First, some teeth were stripped off the ring gear, then a drive shaft twisted and a radius arm was bent. The following day, a rear wheel was twisted loose on its retaining studs, and a drive shaft coupling 'spider' was fractured. All this meant a complete rear-end strip-down on the eve of the race, and, unfortunately, a gearbox retaining bolt was replaced incorrectly, which caused the reverse gear pinion to slip down and mangle the remaining gears just when Surtees looked likely to give Hill some trouble—he was only half a second behind when the box jammed in second gear.

Despite its troubles, the Honda is beginning to justify the faith Surtees has had in it. Whereas the Lotus 49 was the car to beat last year, the Lotus 49B is the 1968 pace-setter, and, on its Monaco performance, it is a considerably more formidable car.

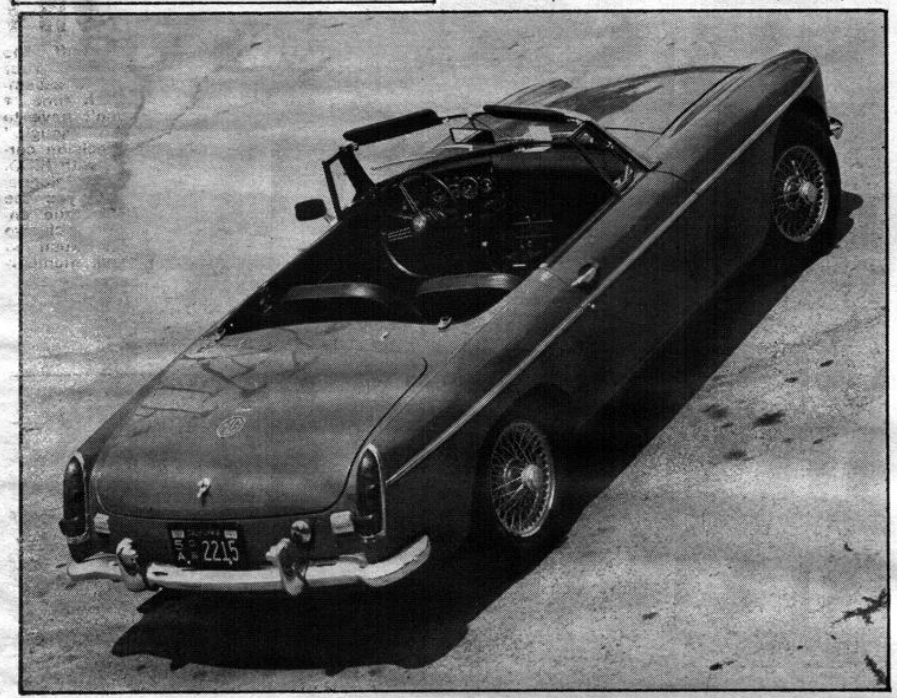
Although Hill's Monaco winner was last year's chassis number 5, it has been so altered as to constitute virtually a new design. The monocoque unit is basically unchanged, but a new bridge structure has been built across the rear of the engine compartment, from which the rear suspension is hung. The front suspension links have been angled forward to increase the wheelbase by nearly three inches, and new split-rim wheels are used, with 11-inch front and 15-inch rear rim width.

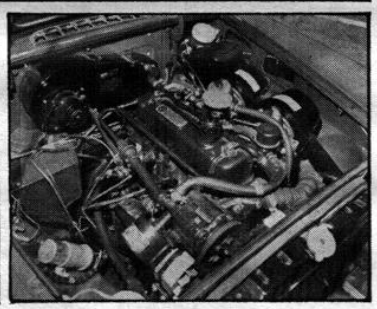
The Lotus 49 made its first appearance at Monaco. It revealed excellent traction, but the 49B was noticeably better, Hill consistently being able to take a tight line into corners and still come out fast without running wide. The car's cornering attitude was close to neutral in places where other drivers were having to combat either considerable understeer or sudden power-induced oversteer. It may have been Hill, of course, but he made it look all so easy. It will be interesting to see whether the 49B is equally impressive through the ultra-fast curves of Spa-Francorchamps. Meanwhile, with one second place and two firsts already under his belt, Graham Hill has made an excellent start toward a world championship season and his effort to take back the title he won in 1962 with the aid of a 1½-liter BRM.

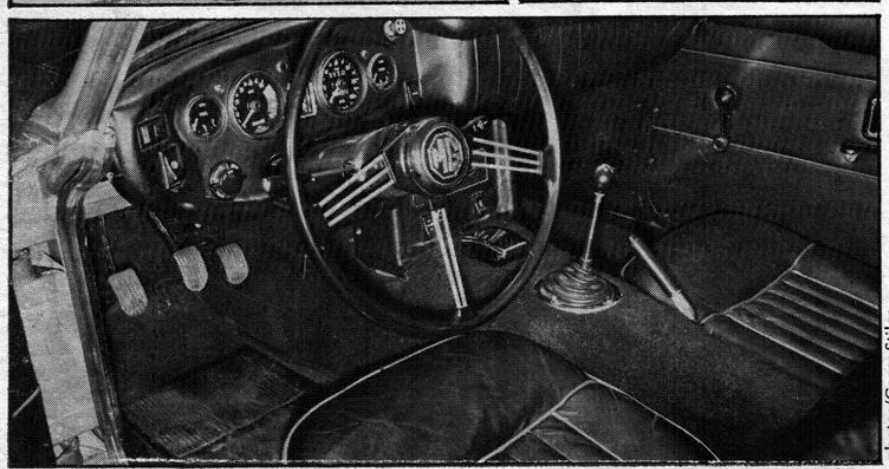
The New MGB

In the late 1940s, the MG TC arrived in America – and the motoring enthusiasts of the time went wild over the strange little car that started a new sporting phase in the automotive tastes of this country. Motoring under the sign of the MG octagon subjected the driver to certain discomforts associated with a cart-like ride, cramped foot room and luggage space, and much-less-than-perfect weather protection. Nonetheless, the T-Series MGs made people aware that driving a car could be real fun; a cult was born.

Numerous successes have come to the various MG models since then, both on the race course and in the market place. A worthy descendant of the mystically enchanting TC is the MGB. Originally appearing in October 1962, the B model has been refined over the years and appeals to people who drive for the sheer pleasure of driving. The 1968 MGB has the familiar four-cylinder in-line, 1798-cc engine fed by twin HS4 SU carburetors. New is the considerable plumbing needed to comply with federal smog standards.







photos/Gerry Stiles

In the cockpit, things have changed quite a bit. Hallelujah! First gear is now synchromesh, and the whole box operates so smoothly that it makes you wonder if it is really British. Gone are the door pockets and glove box of the earlier cars (sniff), replaced by thick and legal padding. On the recessed instrument panel, Germanic knobs sport pictorial reference to their functions, while the tachometer and speedometer are separated by an oddly dissonant square oil pressure gauge. This should be a welcome change from so many years of peering at water temperature and oil pressure intermingled in the standard Smiths gauge. Fronting all this is the good-sized, three-spoked steering wheel with the MG emblem still in the center, propped on the bulbous assembly of the impact-absorbing mechanism. Punching on the emblem, however, does not activate the horn; that action is located on the end of the light dimmer switch sprouting to the left of the steering column. The comfortable front bucket seats provide plenty of horizontal travel for the slim over-six-footer, but heavier people have a problem fitting their thighs under the steering wheel during enthusiastic driving. The wire wheels have been stripped of the "do-undo" ears, but an octagonal wrench is supplied to use with the old standby hammer when changing a wheel.

On the road, the car has all the old charms plus the delight of the new gearbox. With typical MG roadholding ability, it goes where it is pointed, and the forgiving handling characteristics will save all but the most inept driver from the disasters of over-exuberant cornering practices. There is plenty of power available, and the front disc brakes provide more than enough "whoa" for this MG. Rear visibility is good with the top up, and fresh air vents provide reasonable ventilation when the car is closed against the weather.

The roadster as tested sells for under $2900 on the West Coast, a reasonable price for most any kind of fun car. The MGB is neither the most sophisticated nor the most primitive sports car on the market, but it is a very honest piece of equipment that will deliver many hours of pure driving enjoyment to its owner.

With all its modern attributes, the B is still very much an MG. We had to chuckle when, after a sustained run on a warm day, we noticed the traditional warm spot against our right leg as it rested on the transmission tunnel. Great! Some of the old hands must still be in residence at Abingdon, and that is a comforting thought in today's chaotic world.

Beetle's Big Brother

Those perennial rumors of a small Volkswagen replacement are wide of the mark. The "Beetle," it seems, is scheduled for indefinite production. Instead, Volks-

wagenwerk is moving up into the larger car class.

Thus far, only scant details of the soon-to-be-announced VW411 have been released, and this much only because a weekly magazine gained access to and published confidential material.

The photograph released by VW's press department shows the 411 in four-door form, but a two-door version is also to be announced. Both will be available in either standard or deluxe versions. Because the current VW engine-displacement range runs from 1.2 to 1.7 liters, the new car's engine could well be larger than that. It is still an air-cooled, rear-mounted flat-four, and, with its twin carburetors, develops 80 bhp (SAE) at 5000 rpm.

The VW411 has the latest double-jointed rear suspension and a new strut-type front suspension. Automatic transmission is one of a long list of extras, and the car is said to be bristling with safety features. Sounds like some stern continental opposition for Opel and Ford – all except the looks, that is!

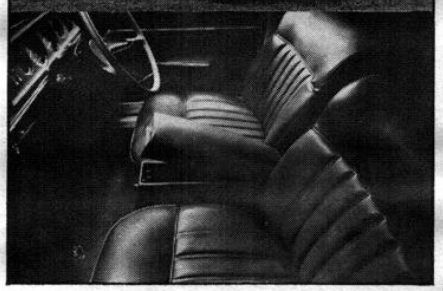
Renault 16TS

The highly original-looking and very versatile Renault 16 has been so successful in Europe (over 300,000 have been built) that a high-performance version has been awaited with considerable impatience. At last it has arrived, as the 16TS, with the same shape but packing considerably more punch from an engine increased in displacement from 1470 to 1565 cc and in output from 63 bhp at 5000 rpm to 87.5 bhp at 5750 rpm. It makes the Renault a genuine over-100 mph car.

The considerable increase in power has come mainly from a completely redesigned cylinder head. In place of the parallel valves and wedge-shaped combustion chambers of the normal Renault 16, the TS has inwardly inclined, larger-diameter valves and ports on opposite sides of hemispherical combustion chambers. The valves continue to be operated by push-rods, but more overlap has been provided.

The very popular Weber twin progressive choke carburetor is used to supply fuel, and a large air filter is mounted separately in the engine compartment and connected to the carburetor by a flexible hose. A resonant problem in the hose, which caused irregularities in the power curve, has been overcome by introducing a resonance cavity in the filter body, which acts as a pulse damper. Renault has also developed a new exhaust system for the new, all-aluminum engine.

The 16TS has been given ten-inch diameter front disc brakes with a servo unit, and 155 X 14 Michelin XAS tires are standard equipment. The car retains the same all-synchro gearbox of the earlier model, which produces road speeds per 1000 rpm of 5.1, 8.2, 12.4 and 17.8 mph. Steering is by rack and pinion, and the all-independent suspension uses upper wishbones, lower links and tie rods, and longitudinal torsion bars at the front, and trailing arms and transverse torsion bars at the rear. Anti-sway bars and tube shocks are fitted both front and rear.



The Renault 16TS has a considerably more luxurious interior than the earlier model, featuring superbly comfortable individual seats trimmed in high-quality cloth, and an overall black interior trim that is also used for the roof lining.

Acceleration times obtained were: 0-50 mph in 8.8 seconds and 0-60 mph in 12.0 seconds.

In producing the original 16, Renault, in the opinion of many experts, has come as close as any manufacturer in satisfying the demand for a thoroughly practical, multi-purpose, under-two-liter family car. Now, with the introduction of the TS version, they have added the sporting ingredient without sacrificing any of the car's established virtues. They may never win the top prize in an automobile beauty contest, but owners, nevertheless, fall in love with them.

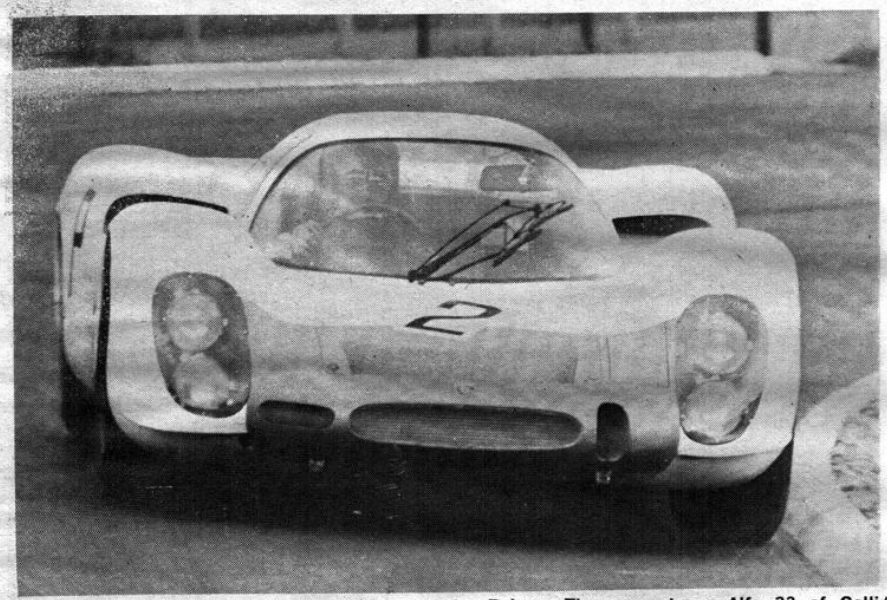
To the best of our knowledge, there are no immediate plans for importing the 16TS into the United States, which we think is a pity. In our opinion, it is Renault's finest product.

Porsche Again

An estimated 200,000 spectators came to Nurburgring anticipating a Porsche victory, and they got what they wanted. After six-and-a-half hours, Vic Elford and Jo Siffert got the new three-liter Porsche 908 prototype home for its first win in two outings. The 908, which appeared in short-tail form at the "'Ring," is very fast. Indeed, so fast that it broke Surtees' old four-liter Ferrari lap record by an even four seconds – and since a chicane has been added in the meantime, this makes the 908 effectively about fifteen seconds faster than the Ferrari.

The main opposition to Porsche came from the J. W. Automotive Ford GT40s, but even Jacky Ickx couldn't stop Stuttgart. Also present were the three-liter Ford prototypes, but a series of problems kept them out of contention, not the least of which was Chris Irwin's very serious crash at the notorious *Flugplatz* (translated "airport," or "flight place"). Chris suffered head injuries, but brilliant surgery saved his life, and he is now making a steady recovery. After various braking and electrical troubles, the second Ford three-liter of Gardner/Atwood was eliminated when another car slid into it off-course, but not before the car had shown real speed. The hopes of Alpine-Renault ended when Henri Grandsire's new A220 prototype crashed at maximum speed and was destroyed. Grandsire miraculously emerged with nothing worse than a damaged wrist and painful ribs. The new Alfa 2.5-liter of Schutz/Bianchi ran right up with the Porsche 907s until alternator trouble forced it back, but the whole Alfa effort is beginning to look like a very purposeful business – and with three-liter engines on the way . . .

At the end there was only one car to talk about – the Porsche 908. There was a driver too – Jacky Ickx – who was doing miraculous things with the GT40, and might even have challenged the second-place Herrmann/Stommelen 907 if there'd been another hour. But there wasn't, and Porsche scored 1-2-4-8, with the two-liter Alfa of Galli/Giunti first in class and fifth overall. Alfisti arise!



Above – The Siffert-Elford Porsche 908 en route. Below – The very strong Alfa 33 of Galli/Giunti winning the two-liter prototype class.

Photos/Eric della Faille

NURBURGRING 1000 Kms
(44 laps)

Pos.	Driver	Car	Class	Laps
1.	Siffert/Elford	Porsche 908	P3	44
2.	Herrmann/ Stommelen	Porsche 907	P3	44
3.	Ickx/Hawkins	Ford GT40	S5	44
4.	Neerpasch/ Buzzetta	Porsche 907	P3	44
5.	Galli/Giunti	Alfa Romeo 33	P2	43
6.	Hobbs/Redman	Ford GT40	S5	43
7.	Schutz/Bianchi	Alfa Romeo 33	P3	42
8.	Neuhaus/ Kelleners	Porsche 910	P2	42
9.	Larrouse/ Depailler	Alpine-Renault	P3	41
10.	Schultz/ Vaccarella	Alfa Romeo	P2	41
11.	Bitter/Jost	Porsche 906	S2	40
12.	von Wendt/ Kauhsen	Porsche 906	S2	40
13.	Gosselin/ Trosch	Alfa Romeo 33	P2	40
14.	Salmon/Piper	Ford GT40	S5	39
15.	Rollinson/Nunn	Chevron-BMW	S2	39
16.	Bradley/ Lambert	Porsche 906	S2	39
17.	Ashmore/Morse	Porsche 906	S2	39
18.	Greger/Huth	Porsche 911T	GT2	39
19.	Delmar Morgan/Walton	Porsche 906	S2	39
20.	Granville-Smith/Reaburn	Ford GT40	S5	38
21.	Sadler/Green	Ford GT40	S5	38
22.	Kraus/Basche	Porsche 911S	GT2	38
23.	Pinto/Villar	Porsche 911R	P2	38
24.	Steinemann/ Spoerry	Porsche 910	P2	38
25.	Killy/Guichet	Porsche 911T	GT2	38
26.	Rothstein/ Gregg	Porsche 911T	GT2	38
27.	Blatzheim/ Hamilton	Porsche 911S	GT2	38
28.	Pilette/ Slotemaker	Alfa Romeo 33	P2	37
29.	Baker/Handley	Austin-Healey 1.3	P1.6	37
30.	Killenburg/ Bialas	Chevron-BMW	P1.6	37
31.	Jackson/ Harvey-Bailey	Lotus-Europa	S2	37
32.	Moore/ Davidson	Ginetta G12	P1.6	37
33.	Krause/ Furtmayer	Abarth 1300 OT	S5	37
34.	Drury/Sanger	Ford GT40	S5	37
35.	Fortmann/ Dietrich	Alfa Romeo TZ	P1.6	36
36.	Mockford/ Hardman	Diva GT10	S2	35
37.	Glemser/Hahne	Porsche 911T	GT2	35
38.	Fall/Brown	MGB	GT2	35
39.	Svensson/ Johansson	Lotus Elan	GT1.6	34
40.	Alexander/ Coles	Nathan GT	P1.6	34
41.	Pigneguy/ Tuckett	Austin-Healey 1.3	P1.6	34
42.	Capri/Danielli	Alfa Romeo Duetto	GT1.6	33
43.	Degner/ Weizinger	Alfa Romeo Duetto	GT1.6	33
44.	Twaites/ Duncan	Chevron-BMW	S2	32

Race time: 6 hrs., 34 mins., 6.3 secs.
Winner's average speed: 95.05 mph.
Fastest race lap: 8:33.0 (99.54 mph), Jo Siffert.

Jacky Ickx after winning at Spa.

Ickx At Spa

If there's one place in the world where you can do without rain, it's the 8.75-mile Spa-Francorchamps circuit, with its ultra-fast curves cutting through the heavily wooded Ardennes. That is, of course, unless you are Jacky Ickx. Maybe it's because Spa is his home course, but any way you look at it, his handling of the J. W. Automotive Ford GT40 was nothing short of miraculous. Granted, on any wet track it helps to be first away at the start, but to complete the first lap with a lead of 38 seconds on everyone else is laying it on a bit thick! After two laps, Jacky's lead was 55 seconds, and he was already passing the tail-enders. By the end of 12 of the scheduled 71 laps, he had overtaken all but the second- and third-placed Porsches, and next time around he even took in one of them. Brian Redman shared the car with Ickx and, though he couldn't match the Belgian's fantastic pace, still he was able to develop a four-minute advantage on the next car. Ickx resumed at the second driver change and took the GT40 home well ahead of everything, averaging 122.11 mph in the process.

Next along was the Porsche 907 of Mitter/Schlesser, followed at a distance by the Herrmann/Stommelen three-liter 908. Earlier, another 908 driven by Vic Elford and Jochen Neerpasch had been going very quickly until Elford lost his throttle linkage on lap 3. After hasty repairs, he staged a Targa Florio-type comeback, moving from 20th to sixth in ten laps. After ten more laps, he had moved into fourth place ahead of the Hawkins/Hobbs GT40, and then handed the car over to Neerpasch. On lap 36, Neerpasch, being pushed by the Hobbs GT40, went into a wild 130 mph spin at Malmedy, ending the cars' hopes and sending the driver to the hospital with fractures and shock.

FOR THE RECORD

Continued

The Koch/Lins 910 easily won the two-liter prototype class, with the similar Steinemann/Spoerry 910 right behind in sixth place overall. The 906 of Bradley/Lambert won the two-liter Group 4 class to make the Porschers even happier. In the final analysis, though, Spa in the wet is always a worrisome business, and most people were happy to see it over.

SPA-FRANCORCHAMPS 1000 Kms.
(71 laps)

Pos.	Driver	Car	Class	Laps
1.	Ickx/Redman	Ford GT40	S5	71
2.	Mitter/ Schlesser	Porsche 907	P3	70
3.	Herrmann/ Stommelen	Porsche 908	P3	69
4.	Hawkins/Hobbs	Ford GT40	S5	67
5.	Koch/Lins	Porsche 910	P2	67
6.	Spoerry/ Steinemann	Porsche 910	P2	66
7.	Bradley/ Lambert	Porsche 906	S2	62
8.	Prophet/Bond	Ford GT40	S5	62
9.	Sadler/Green	Ford GT40	S5	62
10.	Epstein/Liddell	Lola T70	S5	62
11.	Kelleners/ Glemser	Porsche 911T	GT2	62
12.	Pilette/ Slotemaker	Alfa Romeo 33	P2	59
13.	Bianchi/ Grandsire	Alpine-Renault	P3	57
14.	Brown/Enever	MGB	GT2	57
15.	Sanders/Werner	Porsche 911S	GT2	57
16.	Gosselin/ Trosch	Alfa Romeo 33	P2	57
17.	Jackson/Baker	Lotus Europa	S2	57
18.	Bridges/Lepp	Chevron-Ford	P2	57
19.	Taggart/ Goodwin	Chevron-BMW	S2	55
20.	Lawrence/ Wingfield	Deep Sanderson-Ford	P2	52
21.	von Wendt/ Kauhsen	Porsche 906	S2	49
22.	Pigneguy/ Tuckett	Austin-Healey 1.3	P2	49

Race time: 5 hrs., 5 mins., 19.3 secs.
Winner's average speed: 122.11 mph
Fastest race lap: 4:0.3 (127.07 mph), Jo Schlesser.

Scott At The Bridge

In a race only slightly more exciting than a TV test pattern, Skip Scott won the Bridgehampton USRRC. The trouble is, see, USRRC is beginning to look more and more like a tune-up session for "the real thing" (which is spelled "Can-Am"). Only a few of the cars on the grid were anywhere near competitive, with Mark Donohue and Lothar Motschenbacher a full two seconds faster than the next cars, and speeds from there on dropping off sharply. The tenth car on the grid was actually nine seconds slower than the leaders, so you can figure it from there.

Lothar got the pole with a quick 1:30.6, although his Gurney-Weslake Ford was giving away 50 cubes to Donohue's 427 Chevrolet. Donohue was right up close, though, with a 1:30.7 lap, and it only took the drop of the flag for him to get the lead. Lothar was next through the first lap, followed by Scott, Chuck Parsons, sixth qualifier Sam Posey in the Caldwell, and John Cannon in a McLaren Mk. 2. While pulling away, Donohue turned the fastest time of the race (1:31.3) on lap 3, for a speed of 112.826 mph. Posey dropped back to seventh place with his front suspension acting weird, and the procession continued. By lap 9, Donohue had 14 seconds on the field. On lap 18, Lothar's transmission went a-clump, Scott (now second) was way back of Donohue, Parsons was 15 seconds behind Scott, the rest of the field was lost in history, and canasta began to look a pretty racy way to spend the afternoon. By the 34th lap only eight cars were running, and Donohue had a 75-second lead. In a desperate attempt to wake the fans, Donohue put on a spectacular 300-yard skid (caused by a broken half-shaft) on the 34th lap, which gave Scott a win and a lovely bottle of champagne for his patience.

BRIDGEHAMPTON USRRC
Bridgehampton, Long Island, New York
(60 laps, 171 miles)

Pos.	Driver	Car	Class	Laps
1.	Skip Scott	Lola-Chevy	O-2	60
2.	Chuck Parsons	Lola-Chevy	O-2	60
3.	John Cordts	McLaren-Chevy	O-2	59
4.	Leonard Janke	McLaren-Chevy	O-2	54
5.	Werner Frank	Porsche 906	U-2	53
6.	Dick Jacobs	Elva-BMW	U-2	50
7.	Bill Howell	McLaren-Chevy	O-2	48

Race time: 1 hr., 35 mins., 29.8 secs.
Winner's average speed: 107.868 mph.
Fastest race lap: 1:31.3 (112.826 mph), Mark Donohue.

Field at Bridgehampton: (11) Motschenbacher, (6) Donohue, (10) Parsons, (26) Scott, (62) Cannon, and (1) Posey. Photo/C. Marsh

Soggy St. Jovite

It might rain, somebody said, and sure enough, just before the start of the St. Jovite USRRC, clouds like black elephants began to gather over the pitcheresk (sic) 2.76-mile course and people started scrambling around the pits looking for sticky tires. It just wasn't at all what most drivers had in mind, but country boy John Cannon looked like he knew more than he was letting on. Though his old McLaren Mk. 2B wasn't really up to mechanical snuff, he was heard to say with a sly grin well before the race that his gear ratios were correct only if it rained – and guess what happened.

Well, the start looked more like a drag-boat race than anything else. Mark Donohue's McLaren Mk. 6A (pole position, natch) got away first, with second qualifier Lothar Motschenbacher's Mk. 6B lurking somewhere in Mark's rooster-tail, and various other drenched unfortunates lost further back in the mists. By lap 2, Lothar was looking content to settle into a safe, smooth pace well back of Donohue's spray and clatter, and suddenly there was smiling J. Cannon up from 8th on the grid and going like a hydro-out-of-hell. He passed Lothar and, doing an immaculate job on the slithery surface, even managed to push to within fifteen seconds of yon Donohue before Roger Penske gave his driver a "get-moving" signal – and Donohue got moving.

By mid-race, Mark had lapped Motschenbacher and fifteen minutes later Cannon also motored by. At the finish, Cannon had still managed to stay on the same lap with Donohue (the only driver to do so), and collected a lovely bunch of points for his pains. Further back, Lothar got his 3rd, with Bud Morley 4th after an early spin. John Cordts had run in mid-pack most of the

"Why I Like To Lead In The Rain" by Lothar Motschenbacher (11), as told to Mark Donohue (6). Photo/Alice Bixler

race, but came on with a rush to get his McLaren Mk. 2B up to 5th at the finish.

Mark later described the course condition as being "like driving on glare ice," and we didn't hear any more complimentary descriptions from anyone else. But Mr. Cannon wasn't talking.

With half of the USRRC series completed, Donohue had a strong advantage with 27 points. Motschenbacher was second with 17 points.

ST. JOVITE USRRC
Mt. Tremblant, Quebec
(60 laps, 162 miles)

Pos.	Driver	Car	Class	Laps
1.	Mark Donohue	McLaren Mk. 6A-Chevy	O-2	60
2.	John Cannon	McLaren Mk. 2-Chevy	O-2	60
3.	Lothar Motschenbacher	McLaren Mk. 6B-Ford	O-2	59
4.	Bud Morley	Lola-Chevy	O-2	58
5.	John Cordts	McLaren Mk. 2B-Chevy	O-2	58
6.	Chuck Parsons	Lola-Chevy	O-2	58
7.	Eppie Weitzes	McLaren Mk. 6B-Chevy	O-2	58
8.	Sam Posey	Caldwell D7-Chevy	O-2	57
9.	George Eaton	McLaren Mk. 3-Ford	O-2	57
10.	Richard Galloway	Lola-Chevy	O-2	56
11.	George Ralph	Lola-Chevy	O-2	56
12.	Ludwig Heimrath	McLaren Mk. 2-Chevy	O-2	56
13.	H. Kroll	Lotus Kelly	U-2	54
14.	A. Samson	Cobra	O-2	54
15.	Werner Frank	Porsche 906	U-2	52
16.	Ron Courtney	McLaren-Chevy	O-2	51
17.	J. P. Ostiguy	Porsche GT	U-2	49
18.	Skip Scott	Lola-Chevy	O-2	34

Race time: 2 hr., 5 mins., 17.6 secs.
Winner's average speed: 80.44 mph.
Fastest race lap: 85.07 mph, Mark Donohue.

Sell Wins In Colorado

American open-wheel road racing got a boost with the first race of the new five-liter SCCA Formula A pro series. Everything from ex-Indy machinery (Eisert, Halibrand), to converted ex-Can-Am McLaren Mk. 2s, to cars built specifically for this series (Lola T-140, Eagle "A", Spectre HR-1, McKee Mk. 8, LeGrand "A") converged on Continental Divide Raceways for 47 laps around the very tight 2.66-mile road course.

Qualifying got off to a languid start with Lou Sell in the Wynn's-Smothers Brothers Eagle and Jerry Hansen in Ray Hawkinson's Lola T-140 running in the 1:54s, and feeling fat. Then, with only a half hour of qualifying left Saturday and rain threatening, Hansen turned a 1:52.7, Sell gritted his teeth, and things got businesslike. The two traded the pole several times with as little as a tenth of a second separating them. Sell got down to 1:52 flat, but when it was all over, Hansen had the pole with a tasty 151.5 (old record – 155.1 by Jerry Grant in a Lola T-70, 1965). Behind Hansen and Sell sat Mak Kronn in the McKee (1:54.1), Bud Morley's McLaren (1:54.8), and Hank Candler's Lola T-140 (1:55 flat).

The start was a real circus – two smaller formula cars crashed on the pace lap, and Morley's "A" caught fire! The second time around (it's always better) they finally got a green flag, and Hansen got into the first corner well ahead of the riff-raff. Through

FOR THE RECORD
Continued

COLORADO GRAND PRIX
Continental Divide Raceways
Castle Rock, Colorado
(47 laps, 125 miles)

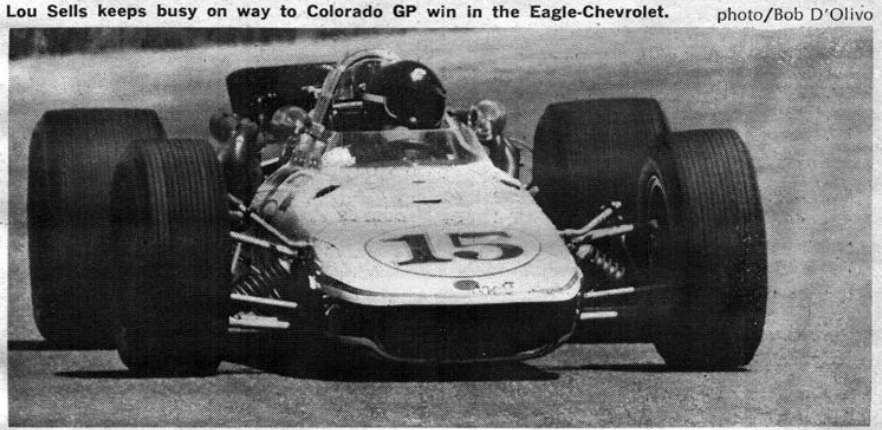
Pos.	Driver	Car	Class	Laps
1.	Lou Sell	Eagle-Chevy	A	47
2.	Jerry Hansen	Lola-Chevy	A	47
3.	Mak Kronn	McKee-Chevy	A	47
4.	Hank Candler	Lola-Chevy	A	46
5.	Jack Eiteljorg	Eisert-Chevy	A	45
6.	Joe Alves	Brabham BT-21	B	45
7.	Chuck Dietrich	McLaren Mk. 4	B	44
8.	Henry Hester	LeGrand	B	44
9.	Stew McMillen	Eisert-Chevy	A	43
10.	Stuart Wright	LeGrand	B	43
11.	Charlie Adams	Brabham	B	43
12.	Gerhard Klose	LeGrand	B	42
13.	Doug Champlin	LeGrand	B	40
14.	Gregg Brumm	Lotus 41	B	40
15.	Walt Mathewson	Cooper-Ferrari	A	39
16.	Ted Clark	Brabham BT-15	B	38
17.	Colin Wilson	Lotus 18	C	37
18.	Bob Ilg	Lotus 20	B	37
19.	John Evans	Lotus 18	B	35
20.	Fred Opert	Brabham BT-21	C	33
21.	Stan Schooley	Merlyn	C	28

Race time: 1 hr., 31 mins., 43.2 secs.
Winner's average speed: 81.78 mph.
Fastest race lap: 1:53.3 (84.52 mph), Hank Candler, new record (old record: 79.80 mph, Ed Marshall. Lotus 35, 1967).

the first lap Hansen and Sell began to pull out from the field a bit, and at turn 1 on the second lap, Sell slipped by Hansen to take the lead. From there until lap 15 the two drivers had a nice duel, but then Jerry got all dusty and dirty off-course at turn 5 and gave Sell twenty seconds in the process. Meanwhile, Kronn and Candler were having a great old time back in third and fourth until Mak began to stretch it out a little around lap 15. During this dice, Candler turned 1:53.3 on the second lap (mit full tanks yet!) for the quickest lap of the race. Back a bit, after various suspension diddlings in practice, Ron Grable got the brand new Spectre going very nicely, only to have his front suspension collapse on lap 19.

Hansen's twenty-second side-trip was the margin of victory for Lou Sell, who rode home with an impressive win in his first big-engine outing. Joe Alves got his Brabham BT-21 home sixth overall and first in Formula B, for a few dollars more. The series looks interesting and, like the summer, will get hotter.

Lou Sells keeps busy on way to Colorado GP win in the Eagle-Chevrolet. photo/Bob D'Olivo



The Latest From Yurp

The Continuing Adventures of Jonathan Williams—Jonathan Williams, who endeared himself to the American racing public last year by having a Can-Am car that turns 12,000 rpm (though under the circumstances, 13,000 might have been advisable), has since left Ferrari for Abarth, which was rumored to have a Formula 1 in the doings. Investigating further, he found no such machine, got tired of watching races, and left Abarth. Now Williams is back with DeSanctis, where he had a very successful Formula 3 career.

***Rule Changes**—Important detail changes in the FIA's Appendix J will affect Group 4 sports cars and Group 6 prototypes after January 1969. Group 6 cars are to be freed of weight, windshield height, and ground clearance requirements and will no longer be forced to carry a spare wheel (which will make them much closer to Group 7 cars). The minimum production of cars necessary for homologation in Group 4 has been reduced from 50 to 25. The 1968 engine displacement limits will still apply, of course, and no major change to Appendix J will be made before 1970 at the earliest.*

The Chain Gang

The four-wheel-drive and chain transmission combination on the Indy Lotus turbines performed so well that reciprocal-engine owners really had to sit up and take notice. Everywhere you turn these days people are saying four-wheel-drive racing is just around the corner, so don't be surprised if there are a lot more than sixty-six drive wheels on the 33 cars that start at Indy next year — turbines or no turbines. And while we're on the subject, look for four-wheel-drive on McLarens and Lolas (and maybe even Chaparral?) In this year's Can-Am.

FORMULA 1 CHAMPIONSHIP STANDINGS

	South African GP	Spanish GP	Monaco GP	Belgian GP	Dutch GP	French GP	British GP	German GP	Italian GP	Canadian GP	United States GP	Mexican GP	Total
Graham Hill	6	9	9										24
Denis Hulme	2	6	2										10
Jim Clark	9	—	—										9
L. Scarfiotti	—	3	3										6
Richard Attwood	—	—	6										6
Jochen Rindt	4	—	—										4
Brian Redman	—	4	—										4
Lucien Bianchi	—	—	4										4
Chris Amon	3	—	—										3
J-P Beltoise	1	2	—										3

MANUFACTURER'S CHAMPIONSHIP STANDINGS

	Daytona	Sebring	Brands Hatch	Monza	Targa Florio	Nurburgring	Spa	Total after seven rounds	Best five scores to count
Porsche	9	9	6	6	9	9	6	54	42
Ford	—	—	9	9	—	4	9	31	31
Alfa Romeo	2	—	—	—	6	2	—	10	10
Alpine-Renault	—	—	—	4	—	—	—	4	4
Ferrari	—	—	2	—	—	—	—	2	2
Lola-Chev	—	—	1	—	—	—	—	1	1
Corvette	—	1	—	—	—	—	—	1	1

USRRC STANDINGS

	Mexico City	Riverside	Laguna Seca	Bridgehampton	St. Jovite	Pacific Raceways	Watkins Glen	Road America	Mid-Ohio	Total
Mark Donohue	—	9	9	—	9					27
Lothar Motschenbacher	1	6	6	—	4					17
Skip Scott	6	—	—	9	—					15
Chuck Parsons	—	3	3	6	1					13
Moises Solana	9	2	—	—	—					11
Sam Posey	3	4	—	—	—					7
Bud Morley	2	—	2	—	3					7
John Cordts	—	—	—	4	2					6
John Cannon	—	—	—	—	6					6
Peter Revson	4	—	—	—	—					4
Jim Hall	—	—	4	—	—					4
Leonard Janke	—	—	—	3	—					3
***Werner Frank**	—	—	—	2	—					2
Swede Savage	—	1	—	—	—					1
Jerry Entin	—	—	1	—	—					1
***Dick Jacobs**	—	—	—	1	—					1

*Indicates under two liters.

TRANS-AMERICAN STANDINGS

	Daytona	Sebring	War Bonnet	Lime Rock	Mid-Ohio	Bridgehampton	Meadowdale	St. Jovite	Bryar	Watkins Glen	Cont. Divide	Riverside	Pacific Raceways	Total
(Over two liters)														
Camaro	6	9	9	9										33
Mustang	9	4	4	6										23
Javelin	—	2	6	4										12
(Under two liters)														
Porsche	9	9	6	9										33
Alfa Romeo	2	4	9	—										15
BMC	—	—	1	—										1
Volvo	—	—	—	1										1

INTERNATIONAL CALENDAR/1968

Including major events sanctioned by FIA, SCCA, USAC, NASCAR, NHRA, and major auto shows.

Key to Abbreviations

C — USAC Championship cars
DR — Drag racing cars
F1 — Formula 1 cars: Group 8
GT — Grand Touring Cars: Group 3
FA — SCCA Formula A cars
NGT — NASCAR Grand Touring cars
S — Sports cars: Group 4
SP — Sports Prototype cars: Group 6
SR — Sports Racing cars: Group 7
Stock Cars — U.S. Stock cars: Group 5b
TA — Trans-American sedan cars

(All dates subject to change without notice)

AUGUST

3 Atlanta, Ga. — 'Atlanta GT 250', NGT (NASCAR, Nat'l Open).
4 Nurburgring, Germany — 'German Grand Prix', F1 (FIA Int'l).
4 Loudon, N.H. — 'Bryar Trans-Am', TA (SCCA, FIA Nat'l).
4 St. Jovite, Canada — 'St. Jovite 200', C (USAC, Nat'l Open).
4 Atlanta, Ga. — 'Dixie 500', Stock Cars (NASCAR, Nat'l Open).
10 Winston-Salem, N.C. — Stock Cars (NASCAR, Nat'l Open).
10-11 Rochester, N.Y. — 'Finger Lakes Rally' (SCCA, Nat'l).
11 Watkins Glen, N.Y. — 'Watkins Glen Trans-Am', TA (SCCA, FIA Nat'l).
11 Milwaukee, Wis. — Stock Cars (USAC, Nat'l Open).
15 Columbia, S.C. — Stock Cars (NASCAR, Nat'l Open).
15 Milwaukee, Wis. — Stock Cars (USAC, Nat'l Open).
17 Springfield, Ill. — 'Springfield 100', C (USAC, Nat'l Open).
17 Weaverville, N.C. — 'Weaverville GT 100', NGT (NASCAR, Nat'l Open).
17-18 Houston, Tex. — 'Coastal Masters Rally' (SCCA, Nat'l).
18 Lexington, Ohio — 'Buckeye Cup USRRC', SR (SCCA, Nat'l Open).
18 Milwaukee, Wis. — 'Milwaukee 200', C (USAC, Nat'l Open).
18 Weaverville, N.C. — 'Weaverville 250', Stock Cars (NASCAR, Nat'l Open).
18 Springfield, Ill. — Stock Cars (USAC, Nat'l Open).
18 Thompson, Conn. — FA (SCCA, FIA Nat'l).
23 Indianapolis, Ind. — 'State Fair Century', Stock Cars (USAC, FIA Int'l).
23 Wilson, N.C. — 'Wilson 100', Stock Cars (NASCAR, Nat'l Open).
25 Austria — 'Grand Prix of Austria', S, SP (FIA Int'l).
25 Castle Rock, Colo. — 'Continental Divide Trans-Am', TA (SCCA, FIA Nat'l).
31 Darlington, S.C. — 'Darlington 250', NGT (NASCAR, Nat'l Open).

SEPTEMBER

1 Elkhart Lake, Wis. — 'Elkhart Lake Can-Am', SR (SCCA, FIA Int'l).
1 DuQuoin, Ill. — Stock Cars (USAC, Nat'l Open).
1-2 Indianapolis, Ind. — 'Summernationals', DR (NHRA, FIA Int'l).
2 Lime Rock, Conn. — 'Lime Rock Grand Prix', FA (SCCA, FIA Nat'l).
2 DuQuoin, Ill. — 'DuQuoin 100', C (USAC, Nat'l Open).
2 Darlington, S.C. — 'Darlington 500', Stock Cars (NASCAR, Nat'l Open).
6 Hickory, N.C. — Stock Cars (NASCAR, Nat'l Open).
7 Indianapolis, Ind. — 'Indianapolis 100', C (USAC, Nat'l Open).
7-8 Morristown, N.J. — 'Jersey 500 Rally', (SCCA, Nat'l).
8 Mansfield, Ohio, Mid-Ohio FA (SCCA, FIA Nat'l).
8 Riverside, Calif. — 'Mission Bell Trophy', TA (SCCA, FIA Nat'l).
8 Milwaukee, Wis. — Stock Cars (USAC, Nat'l Open).
8 Monza, Italy — 'Italian Grand Prix', FI (FIA Int'l).

8 Richmond, Va.—'Capital City 150', Stock Cars (NASCAR, Nat'l Open).

13 Beltsville, Md.—Stock Cars (NASCAR, Nat'l Open).

14-15 Pittsburgh, Pa.—'Tri-Valley Rally' (SCCA Nat'l).

15 Bridgehampton, N.Y. — 'Chevron Grand Prix', SR Can-Am (SCCA, FIA Int'l).

15 Hillsborough, N.C.—'Hillsborough 150', Stock Cars (NASCAR, Nat'l Open).

21-22 El Paso, Tex.—'Rolling High Rally' (SCCA, Nat'l).

22 St. Jovite, Canada — 'Canadian Grand Prix', F1 (FIA Int'l).

22 Brainerd, Minn. Donnybrooke Speedway FA (SCCA, FIA Nat'l).

22 Trenton, N.J. — 'Trenton 200', C (USAC, Nat'l Open).

22 Martinsville, Va. — 'Old Dominion 250', Stock Cars (NASCAR, Nat'l Open).

27 Warren, Ohio. — Nelson Ledges FA, (SCCA, FIA Nat'l).

28 North Wilkesboro, N.C. — NGT (NASCAR, Nat'l Open).

28 Edmonton, Alberta, Canada — 'CRDA Can-Am' SR (CRDA, FIA Int'l).

28-29 Philadelphia, Pa. — 'Appalachian Rally' (SCCA, Nat'l).

29 Sacramento, Calif. — 'Sacramento 100', C (USAC, Nat'l Open).

29 North Wilkesboro, N.C. — 'Wilkes 250', Stock Cars (NASCAR, Nat'l Open).

OCTOBER

6 Watkins Glen, N.Y. — 'United States Grand Prix', F1 (FIA Int'l).

6 Kent, Wash. — 'Pacific Raceways Trans-Am', TA (SCCA, FIA Nat'l).

6 New Bremen, Ohio — Stock Cars (USAC Nat'l Open).

6 Detroit, Mich. — '250 Mile USAC Championship', C (USAC).

12 Charlotte, N.C. — 'Charlotte GT 250', NGT (NASCAR, Nat'l Open).

12-13 New York, N.Y. — 'Rip Van Winkle Rally' (SCCA, Nat'l).

13 Monterey, Calif. — 'Monterey Grand Prix', SR Can-Am (SCCA, FIA Int'l).

13 Charlotte, N.C. — 'National 500', Stock Cars (NASCAR, FIA Int'l).

18-27 Toronto, Can.—'Toronto Int'l Auto Show.'

19-20 Louisville, Ky. — 'Bluegrass Rally' (SCCA Nat'l).

20 Hanford, Calif. — 'Hanford 200', C (USAC, Nat'l Open).

24-31 Los Angeles, Calif. — 'L.A. Int'l. Auto Show.'

25-31 Boston, Mass. — 'New England Int'l Auto Show.'

27 Riverside, Calif. — 'Times Grand Prix', SR Can-Am (SCCA, FIA Int'l).

27 Rockingham, N.C. — 'American 500', Stock Cars (NASCAR, FIA Int'l).

ENTHUSIASTS' CORNER

BY JEAN CALVIN

Mustang III

The urban areas of northern California house a great many rally clubs, and there is so much activity that, no matter what your rally specialty, you can keep busy any weekend. We have had many requests to "come and see how they do things up north," so last month we did just that, and went along on the Mustang III, a time and distance rally put on by the Downtown Ford Rally Team of Sacramento. Winners accrued points toward both the California State and Northern California Sports Car Council Championships.

Mustang III was an eight-hour rally, but differed from the norm in that the first car was sent out at 6 p.m. and the majority of the rally took place in the dark. It was a well-organized affair from start to finish. A really nice touch was the mid-Saturday afternoon luncheon for the workers, held prior to their departing for their night-long posts at various remote control sites. Everything from Minis to Mustangs, sporting a wide variety of driving lights, assembled at the start, and the teams pondered the precisely written general instructions. Route instructions were available just three minutes before departure time.

We followed rallymaster Frank Damerval through to the second checkpoint, and were mighty glad we did. The rally started on a series of overlapping notes mixed in with the numbered instructions, and the notes themselves were scrambled in individual order. The second instruction after the odometer run started a note, and at times the harried navigator would have several multipart notes going at the same time. For the first three hours there was always at least one note active, and, under the rules, notes were not canceled at a checkpoint, but had to be instructed out of the program. Whew!

We waited at checkpoint 2 to get an idea of who was doing well, and the first car to arrive was number 10. Obviously we were not the only one to be confused, but, as the rally moved into darkness, the instructions became more straightforward, but were still quite a challenge. Average speeds were all listed to at least one decimal point, and just to keep the Curta people busy, no average speed was used twice on the route. There were two gas and food stops along the way, and all but two cars completed the whole route, although some were a bit later than expected. Unfortunately, the narrow but scenic roads through the California gold rush country were traversed in the dark, and there were some dandy roads. Luckily the weather was just what the Chamber of Commerce said it should be.

True times and a leg-by-leg critique were handed out at the final control. Dawn saw the entire company rehashing the night's adventures at a pancake house in Sacramento, while the rally committee sorted the myriad protests and time allowance requests. We thought some of the instructions a bit mystifying, but our escort, Skip Scott, from the sponsoring club, had explained all by referring to the general instructions, which differ somewhat from other areas. Nonetheless, when year-end points are involved, people will protest a nebulous point, and, therefore the final results in some classes were held up pending an appeal to the council. Despite these problems, the majority of the entrants seemed to enjoy the rally, and as long as the driver and navigator can agree on rule interpretation, northern California championship events should prove to be interesting and highly competitive for the serious rally team.

Photos/Jean Calvin

Above — Rallymaster Frank Damerval, far left, gives final instructions to crew setting up checkpoint before forging ahead to open the course. Below — Skip Scott posts one of the several "goof signs" necessary on Mustang III to bring the wandering cars back on the rally route.

Bright Prospects for BMC Rally Cars

From England comes an interesting item for fans of performance cars built for rally-type endurance. Local rally enthusiasts picked up a comment by British Leyland boss Sir Donald Stokes, on the occasion of the official inauguration of BLMC in London. Sir Donald, questioned about participation in motor sport, said, "I am very interested in rallies and motor sport, if we can win." (Note the specific mention of rallies, but not of racing.) He also inferred that he had no intention of disbanding BMC's competitions department, which of course has always been strongly rally-oriented. Perhaps one day soon, Sir Donald will provide the rally world with a worthy successor to the Mini with which to tackle special stages.

Porsche Wins In Germany

Pauli Toivonen of Finland took a commanding lead in the drivers' section of the European rally championship, held on May 5, when he finished overall winner of the West German Rally, in which he failed to collect a single penalty with his factory Porsche 911T. His team-mate, Sobieslaw Zasada of Poland, also had a clear run in his 911S, but Toivonen was given the verdict, having set slightly faster times on the special test. The Finn now has two firsts and a second in the first three events counting toward the drivers' contest, and he was also the outright winner of one of the rallies counting towards the constructors' title.

Although the rally started in Wiesbaden, most of the 1300-mile route and the special tests were set in Czechoslovakia, and the majority of the works teams were absent from the 147-car entry list, nearly half of which was made up of German cars.

Main opposition to the factory Porsches came from the two Alpine-Renaults of Jean-Francois Piot and Jean Vinatier, which finished a comfortable third and fourth ahead of two locally entered Renault Gordinis.

With Toivonen's latest victory, Porsche has won five of the first six European championship rallies, and it is fair to point out that it did not enter any factory cars in the sixth event – the Tulip Rally.

Escort Wins the Tulip

Fresh from their win on the Circuit of Ireland with the Escort, Roger Clark and Jim Porter followed up by giving Ford of England's new model its first European Championship victory by collecting first place in Holland's International Tulip Rally, held last April.

Clark and Porter headed an Escort one-two, with Ove Andresson and John Davenport finishing a bare 5.1 seconds behind at the end of the various special stages, elimination tests, and a 2200-mile route through Belgium and France to the Swiss border, then back to Holland again.

The Tulip organizers have a curious arrangement for marking their rally and setting a target time for special stages which, on this occasion at least, proved within the capabilities of several competitors. As a result, these tests did little to determine the final rally standings. It was left to the tie-deciding elimination tests to sort out the winners from those who were clean on the road sections.

The Alpines of Larrousse and Andruet proved consistently fast on the tests, but both lost time on the road through navigational errors, leaving the two Escorts in a commanding position, while a third Ford, a Lotus Cortina driven by the Belgian champion Gilbert Staepelaere, dropped out of a challenging position by rolling over on a special test.

Factory participation by teams of Ford Escorts, BMC Minis, Alpine-Renaults, Datsun Fairladys, DAFs, Wartburgs and Trabants, gave some quality to the entry list, which was down on its usual quantity with only 77 entries. The Tulip Rally formula of long, boring road sections lacing together a relatively small number of tests (not to mention a high entry fee) caused it to fall from favor with many rally crews. It is now something of a paradox, for, although amateur ralliests are always made to feel welcome, they now have to pay dearly for the privilege of competing. On the other hand, the works crews, whose entrants meet their expenses, become bored because the rally is not tough enough, yet they have to compete if they are in the hunt for championship points. But there was one thing about this year's Tulip – if it bored the Escort drivers, they certainly didn't let it show!

Jersey Devil Rally

From southern New Jersey comes word of a spring rally that must have been a real beaut. Ninety-five cars tackled the Jersey Devil, a one-day excursion that was designed like a rotunda or wheel with four quarters – four sections of cars, each running a different section at one time. Got that?

Now, each section of the rally was a unique (meaning different) type of rally. There was a map section, using the format developed in European events; a "Tulip" rally, using those dandy little arrows for direction; a "clue" rally, reflecting the more common style of route instructions used in domestic time-speed-distance events; and a picture clue section. All this information was contained in the twelve page general instructions, and, on rally day, there were fifteen additional pages of the various route instructions. Reproduction of the maps and pictures was well done, and for the rally teams that could retain their sanity, it must have been a fun run. Imagine seeing another car from your rally, when you might not be too sure of your location, but then realizing that said car was probably working on a different section. Wheeeee.

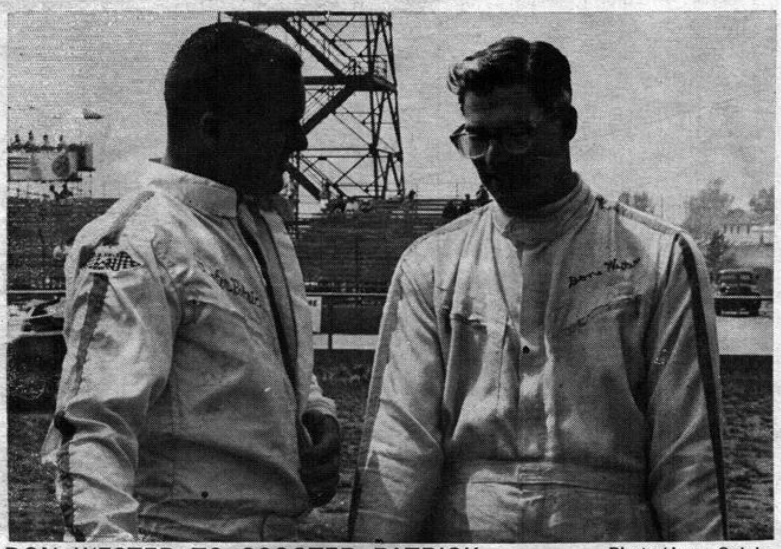
If this sounds like the kind of tonic to spruce up your sagging rally program . . . don't ask us for details, but write to J. R. Douglas, Activities Director, South Jersey Sports Car Club, 46 Mohawk Trail, Medford Lakes, New Jersey, 08055.

New Club On The Race Scene

The great Northwest, a hotbed of sports car enthusiasm, has recently produced a new road-racing club. Northwest Motor Sports, Inc., is located in Spokane, Washington, and some of its stated goals are to preserve the ownership and operation of sports cars, and promote competitive events such as races, hillclimbs, and skill driving trials for its members. The new club, affiliated with the International Council of Sports Car Clubs, recently sponsored a race at Deer Park, near Spokane. A good field of cars turned out to cope with the somewhat bumpy surface of the old airport and the weather. On a single lap, competitors encountered snow, hail, rain, and sunshine; it sounds like the ideal place to race a sedan with windshield wipers and other conveniences. The Deer Park event, the first race for several years in the area, was quite a success, and the club plans a full schedule of races, autocrosses, and hillclimbs. NWMS also publishes a monthly magazine with a full calendar of events for the northwest area. If you are interested, write to Northwest Motor Sports Inc., 1318 So. Browne, Spokane, Washington.

ADVERTISING INDEX

OFF CAMBER



DON WESTER TO SCOOTER PATRICK

Photo/Jean Calvin

Hell, no, Scooter — I didn't tell the announcer your name is really Merlin.

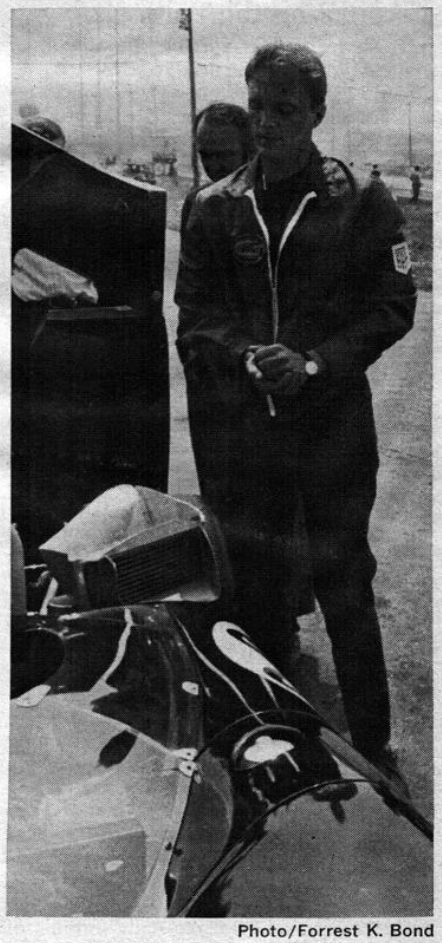
Photo/Rainer Schlegelmilch

You don't like leather potties? Well, then — buggar off!

Photo/Jack Brady Assoc.

BRUCE McLAREN TO STIRLING MOSS AT ST. JOVITE

We've got to stop meeting like this. I think Denny's getting suspicious!



Photo/Forrest K. Bond

DAN GURNEY TO CAR 36 AT RIVERSIDE USRRC

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