


FULL DETAILS: NEW DATSUN 240Z SPORTS SPECTACULAR!

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FOREIGN CAR GUIDE
WORLD
CAR
GUIDE



JANUARY 1970 60¢



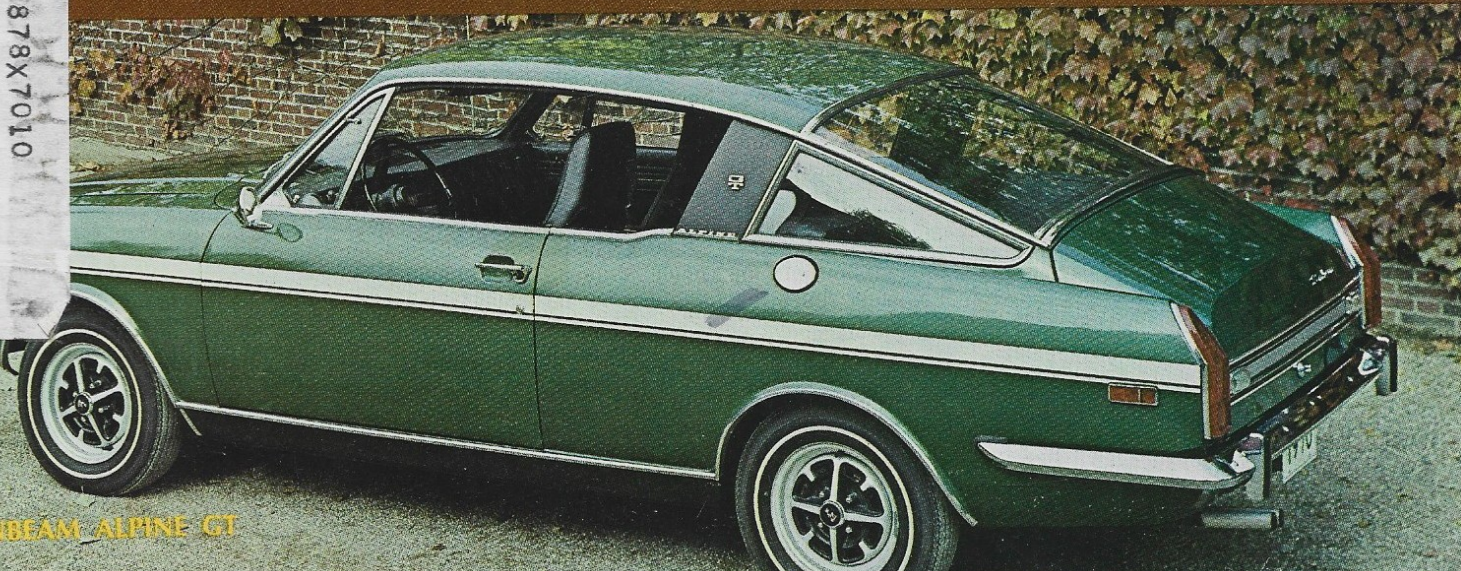
'70 EMPI IMP

ROAD TESTS: AUDI 100LS
'70 BEETLE • SUNBEAM GT
A WCG EXTRA:
LATEST VW SPECIALS
PLUS: The Best From
London and
is Shows
AND PRIX OF THE U.S.
APMAN'S NEW 4wd GP



DATSUN 240Z

SCA94122ARINR1878X7010
 R V ARIANI
 1878 23RD AVE
 SAN FRANCISCO
 CA 94122



SUNBEAM ALPINE GT

This year a "T" goes more like an "E"
 an "E" goes more like an "S"
 and an "S" just goes like H.



HORSEPOWER, SAE			0-60 mph, sec.			TOP SPEED, mph			SUMMARY
Model	1969	1970	Model	1969	1970	Model	1969	1970	
911 T	125	142	911 T	10.5	10.0	911 T	125	128	Ten percent increase in engine size (from 2 liters to 2.2 liters) gives more power, speed and acceleration. This year, you get a lot more Porsche in your Porsche.
911 E	158	175	911 E	9.0	8.0	911 E	134	137	
911 S	190	200	911 S	8.0	7.2	911 S	140	144	

PORSCHE®

WORLD



CAR GUIDE

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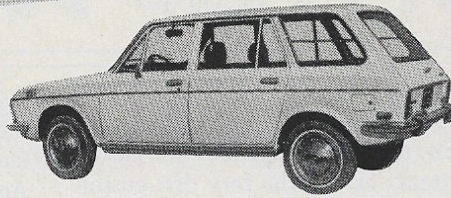
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TARS

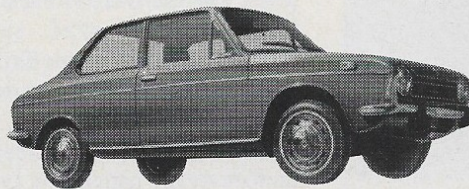
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SUBARU STAR WAGON



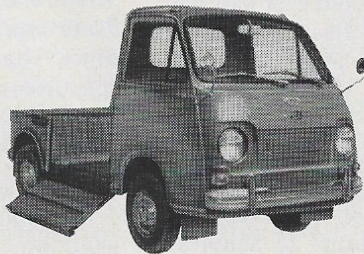
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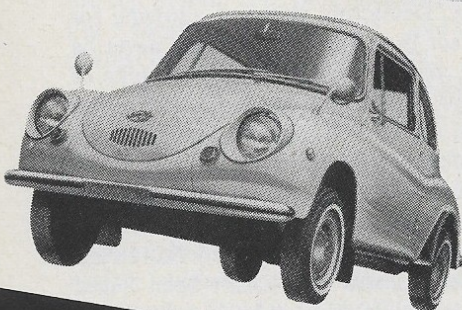
SUBARU STAR / 2 DOOR



SUBARU VAN



SUBARU TRUCK



SUBARU 360



WCG'S EDITOR IS ENGLAND:

Our man in England is "senior" in terms of experience among the members of our staff but his constant participation in rallies, speed trials, economy runs and hill climbs on both cars and motorcycles proves that the active life neither begins nor ends at forty.

Joe Lowrey graduated with first class honors from London University in 1939 just in time to get drawn into the Hitler war which he spent in aero engine research and trouble shooting, flying regularly as an observer in experimental craft. Even then he commenced writing about motoring in his spare time, becoming an authority on how to extract maximum performance from Bentleys and Invictas converted to run on coal gas.

In 1946 he took up a position as a technical editor of MoToR, the prestigious British weekly with readers astute enough to flood the correspondence columns with letters pointing out an error in the cylinder dimensions of a 1903 De Dion twin. He left in 1963, by which time he was "the" technical editor, because a big Fleet Street publishing house had bought the family-owned magazine and the job was no longer fun.

He has successfully freelanced since as a member of the Guild of Motoring Writers. He and his wife Margaret live in "Northolme," a 93-year-old house with "about" eight bedrooms in the small country town of Winslow midway between London and Birmingham.

Joe says his place in motoring history is when they first opened the Goodwood track, he was the very first person to overturn a car there. His luck still held on a Bahama honeymoon where Margaret broke her back racing a Formula Vee. All of this hasn't taught either of them a sense of self-preservation for if you'll remember in our July, 1969, issue, their road test of the new Rover V-8 consisted in part of a class win in Britain's 1000-mile Mobil Economy Run. Unlike the late U.S. version, this event includes a three-hour speed phase on the Oulton Park Road Racing Circuit.

The family's 2-liter Triumph Vitesse with overdrive and a sunroof shares old stables with Margaret's rally debris, consisting of one Sunbeam Imp ex-factory team car and a twin-cam Ford Escort.

BANNING INTERNAL COMBUSTION:

No one seriously thought that the Petris Bill, calling for a ban on the sale of internal combustion engines in California by 1975, would ever pass and it didn't. However, it reflects the temper of the times and most particularly, the widely held notion that Detroit is deliberately stalling.

That accusation is as old and, to an extent, as unfounded in fact as the mythical pill that the oil companies purportedly paid millions to suppress because it would double your gas mileage. Without awarding any unjustified bouquets, the record does show that Detroit and Europe too have been actively experimenting with sources of automotive power other than the internal combustion engine long before smog became a problem.

The stalling, oddly enough, boils down to communication or the lack of it. Opinion Research Corporation recently polled a scientific sampling of households on behalf of a TV show called "The Advocates" and found that 62 per cent of the respondents favored Petris's idea, 23 per cent were opposed and 15 per cent had no opinion.

These results indicate that the auto

industry faces a public relations problem of major magnitude, not just in Los Angeles but in 137 other cities covered by the poll as well. And ironically, the Ford Foundation helped pay for this indictment.

Apparently 62 per cent of the nation doesn't know that the Doble Steamer and the Detroit Electric, the last of their respective breeds, both expired as commercial ventures in 1933. Chrysler's turbine was first publicly demonstrated in an otherwise standard passenger car in 1954 and in 1961, about 50 people chosen at random drove turbine cars for a month each with no failures or problems of any kind except fending off curious neighbors. Rover had one even before 1954.

A price of \$17,500 undoubtedly contributed to the Doble's demise because its performance was neither better nor worse than contemporary Cadillacs or Lincolns at a quarter of that figure. The \$7,000 Detroit Electric would run four hours at a maximum speed of 40 mph, parameters about on a par with today's experimental electrics.

Much more recently, General Motors and a government group called the Morse Panel independently determined that a turbine would cost three times as much as an equivalent piston engine. They disagreed on steam, the Morse Panel figuring a factor of 1.5 and GM three, but on batteries there was concurrence on a factor of six. These figures relate to the technology of 1967-68, and no breakthrough has occurred since.

I wonder, therefore, if the 62 per cent who favor banning the internal combustion engine realize what a car would cost them were such legislation enacted? Off the dealer's shelf, today's piston engine lists at about \$850 of which about 25 per cent represents profit. Deducting this and allowing for the fact that this engine would never be built, you come up with a price hike of \$1,280 per turbine car and \$320 for the steam car, this last being based on the optimistic Morse estimate.

More likely, the higher figure applies to both because shortly after issuing his estimate, Dr. Morse entered the steam engine business and hasn't been heard from since. If any reader has spotted a Morse puffing down the highway, please let me know care of this magazine. ●

READER'S



FORUM

Upside-Down Rotary

Sirs: On page 35 of your Nov. issue I believe your drawing of the rotary-piston Mercedes C-111 engine is upside down. Shouldn't oil sumps be at the bottom and filler caps at the top? That would make the drawing easier to follow!

Richard E. Ashley
Grenland, N.H.

It would also keep the oil from leaking out. Our red-faced production manager acknowledges that when it comes to rotary engines, he doesn't know top from bottom.

Confusing Kombi Prices

Sirs: Your magazine has convinced me that a 1970 VW Kombi with camper conversion would suit my needs perfectly. I want to buy the stripped Kombi (no extras whatever) for cash as being permanently retired here in Mexico, I can't get financing. Then I'd buy the camping kit piecemeal from Sportsmobile in Andrews, Ind., (WCG, May '69) as my wallet can afford it. I thought this was the cheapest way so I wrote various U.S. dealers asking for quotes. The answers ranged from \$2700 to \$3000 plus freight and all the other add-ons. In the same letters they all quoted a "basic Campmobile" for \$2375 plus \$650 for the kit and \$450 for the pop-up top, rack and tent. Now I'm thoroughly confused and the nearest dealer is 1000 miles away.

Herbert Rhoton
Chapala, Jalisco, Mex.

The Kombi, which currently carries a factory suggested list price of \$2619, is not sold without seats. The basic Campmobile is essentially the same vehicle without seats other than up front and it lists for \$2469. Then, at the time of vehicle purchase only, you can order equipment kits totaling \$732 or

\$1237, depending upon whether you want the pop-up unit and tent or not. The VW price above includes installation in Germany although the pieces are also sold over the counter in the U.S. to do-it-yourselfers at a considerably higher price. The basic Campmobile is considered a passenger car for purposes of taxation. A panel truck costs less but you blow the savings by having to install windows at the time of camper conversion and, of course, VW makes no kits for these. As to the price structure of the vehicles or pieces, remember that the factory can only suggest to the dealers what to charge. You have every right to bargain over the quotes you receive from a dealer, but that is rather hard to do by mail. Keep in mind that the difference between a dealer's actual cost and the factory suggested list price is about 19% in the case of VW vehicles. For more complete information on the official VW Campmobile (excepting advice on how to bargain) write William G. Haworth, Director of Public Relations, Volkswagen Pacific, Inc., 11300 Playa St., Culver City, Ca. 90232. For information on the Sportsmobile, write Charles L. Borskey, Sportsmobile, Andrews, Ind. 46702. Their installed prices are somewhat cheaper than VW's but you have to add in the cost of the trip to Indiana for installation.

Import Regulations Again

Sirs: In your Oct. '69 issue you say that it is legal to import a '68 Austin Mini Cooper S into any state except California. Is the same true of a '68 VW bus built to German specifications? I was under the impression that no cars built after January 1, 1968 could be imported to the U.S. without have an exhaust emission control incorporated. Is this true?

T.W. Bradley
APO 09144 New York

Our statement is correct. The Jan-

uary 1, 1968 U.S. regulation required only positive crankcase ventilation and the authorities permit you to have this accomplished after the car arrives. The cost should be no more than \$20. January 1, 1969 was the crucial date for imports as it was then that the federal government, not just California, required all new cars to be equipped with the much more complicated exhaust emission controls. This cannot be practically accomplished on vehicles not specifically designed for the equipment. You're not entirely home clear, though. Some states may require that you bring the lighting and windshield glass of your German spec bus up to their standards before registration plates can be issued. Meanwhile you can drive around until they catch you with your German or U.S. Forces tags.

Stick or Automatic?

Sirs: I'd like to see some articles on the '70 Squareback with manual shift versus the automatic version. I'm considering this as my next car but am undecided as to which shift I should choose. The one with the least amount of trouble would be for me.

Eugene Balzarini
Brooklyn, N.Y.

We'll be roadtesting one new VW a month, starting with this issue on page 12, until we've covered every major variant. This series will include separate tests of the stick and automatic 1600's as well as the stick and semi-automatic beetle. You'll soon be able to make your comparison.

Value of an M-B 170S

Sirs: I have just acquired a 1950 Mercedes Benz 170S convertible that I'm planning to restore. Before I sink too much money into this venture, could you tell me the current value of this car? Is this car considered a classic by any standards? It is, I believe, a virtual duplicate of the 170V, circa 1935.

Harland G. Ranney
New Shrewsbury, N.J.

Technically your car is not a "classic" as defined by the Classic Car Club of America but it certainly qualifies as a "special interest" machine. Good M-B 170S convertibles sell for between \$2000 and \$2500 in the Los Angeles area at least, and there is no

(Continued on Page 55)



by David Ash

FORMULA A COMES OF AGE . . . The 13th and final Formula A event for the season fittingly will be held at Sebring on December 28th with Sam Posey and Tony Adamowicz to decide the championship between them. These Indianapolis-type cars are powered by U.S. mass-produced pushrod engines of up to 5000 cc with fuel limited to 30 gallons and weight to 1250 lbs. Or you can use imported mills (Alfas are favored) between 1100 and 3000 cc with no mechanical restrictions and supercharged engines up to 1500 cc. It all started out as a form of poor-man's racing (you can field a car for about \$20,000) for those who had graduated from lesser classes, but the cars are almost as fast as the Offies and dohc Fords for crowd appeal. They're appealing, too, for promoter Alec Ulmann anticipates 25,000 to attend. What's more, Alec attracted a new kind of sponsor. Embattled Liggett & Myers, selling more cigarettes than ever despite the cancer scare and with all that embargoed television money to spend, is footing the bulk of the guaranteed purse of \$40,000 plus tossing in another \$10,000 to pay drivers like John Surtees and Jackie Stewart appearance money and expenses. Surtees, Stewart and their ilk can't take the win away from an "amateur" or deny either Posey or Adamowicz his championship no matter how the pack crosses the finish line. The international racers are there as paid guests. L & M's reward is to have a Grand Prix race go down in the record books named after them. This is a first for a tobacco company in the U.S. although Gold Leaf and Players have been active in Europe and Canada, respectively, for years. I wonder, though, if this race is televised, how the broadcasters will call it?

TEAM RENAULT FORMED . . . It never hurts for an auto company to keep in touch with its owners and one way is to form a club, then use the corporate financial and publicity resources to prod said club into meaningful activity. That's the purpose behind Team Renault whose first event was an ambitious rally that converged on New Orleans. The advisory board of the non-profit (in fact, you can bet that they'll lose a bundle) organization includes Tracy Bird, the managing director of SCCA; Rene Dreyfus, former driving champion and LeMans winner who now owns the popular Chanticleer Restaurant in New York City; John Fitch, former Mercedes team driver and now safety consultant; and, yours truly. Aside from putting Renault owners into communication with each other, reduced cost group travel and tours will be sponsored and members will be offered special prices on gifts and imports. Initiation fee is \$5 and there are no annual dues. Membership is open to any Renault owner or to any member of a family which owns a Renault. For further information, write Team Renault, 100 Sylvan Ave., Englewood Cliffs, N.J. 07632.

AAA BREAKDOWN LIST . . . The American Automobile Association which has 12 million members in the U.S. and Canada and 26,000 service stations under contract has a pretty good idea of what causes a car to break down. It should because it had to foot the bill for 76,668,000 service calls in 1968, a figure that closely approximates the total number of cars in operation at the time. In order, the causes are:

1. Battery and electrical incl. ignition and starter - 33,809,000 or 44%.
2. Tires - 12,217,000 or 16%.
3. Stuck - 10,757,000 or 14%.
4. Out of gas - 3,074,000 or 4%.
5. Lock and key - 1,537,000 or 2%.
6. Fuel system - 1,500,000 or 2%.
7. Brakes - 1,480,000 or 2%.
8. All others - 12,294,000 or 16%.

SUNBEAM ARROW WINS POR . . . In its first U.S. competition, Chrysler-Plymouth's Sunbeam Arrow piloted by the factory team of Scott Harvey and Ralph Beckman won SCCA's National Press-On-Regardless Rally. A Porsche 911T was second and a SAAB 96, third. The two-night affair held mostly on logging roads in Michigan's Lower Peninsula drew 65 starters but only 15 survived to cross the finish line. The

Arrow is the U.S. version of the Hillman Hunter, outright winner of the 10,000-mile London-Sidney Marathon held a year ago. Next year the POR will be listed as an FIA International event, joining the Canadian Winter Rally and the Baja 1000 as the only ones on this continent.

U.S.-BUILT AUTOMATICS FOR DATSUN . . . Borg-Warner Corporation will supply Datsun's entire requirement for three-speed automatics on 1.6-liter cars from its plant in Muncie, Indiana. Previously, Datsun was serviced from B-W Ltd.'s plant in Letchworth, England, but growing European demand has outstripped facilities here. The arrangement will hold until a joint venture between Borg-Warner and Aisin Seiki Co., Ltd. to establish a manufacturing facility near Kariya City in central Japan becomes a reality. The spurt in European demand for automatics was in a sense a social revolution because for a long while, no self-respecting Frenchman or German would admit that he couldn't shift gears faster and more smoothly than a machine. And, of course, tiny, gas-pinched engines didn't help demand, either. The sudden dissolving of the prejudice combined with a new affluence that could feed bigger engines caught B-W, as well as ZF and Ferodo, quite by surprise. Most of the Muncie output will make a round trip back to the U.S. in completed Datsun.

MORE REVERSE LEND-LEASE . . . Your next new Toyota will probably have vinyl floor mats made in Wooster, Ohio, by Rubbermaid; bumper guards, console, arm rests and gear shift knobs by American-Carry Products of Hollywood; and outside mirrors by Yankee Metal Products Corp. of Norwalk, Conn. You can be certain that these purchase decisions were a matter of hard-nosed economics, not an attempt to thank the U.S. for making Toyota the No. 3 import here, but just why the Japanese can't make these particular products more cheaply themselves, as they can most other goods, wasn't explained. On another front, Toyota has announced the recall of 3700 1968-1969 Crown models and 5800 '69 Corollas for inspection, the Crowns to see if the front flexible brake hose is rubbing against the front spring bumper and the Corollas to replace gear shift levers on manual transmissions. It seems

(Continued on Page 10)

The horse is better than most 1970 cars.

We are not joking. The run-of-the-mill 1970 car is an affront to progress.

It's too expensive to buy. And too expensive to run. It's almost impossible to park, and maneuvering it through city traffic would try the nerves of a saint.

You'd be better off with a horse.

Which is sure-footed, inexpensive, maneuverable and it eats hay. Nice, cheap, hay.

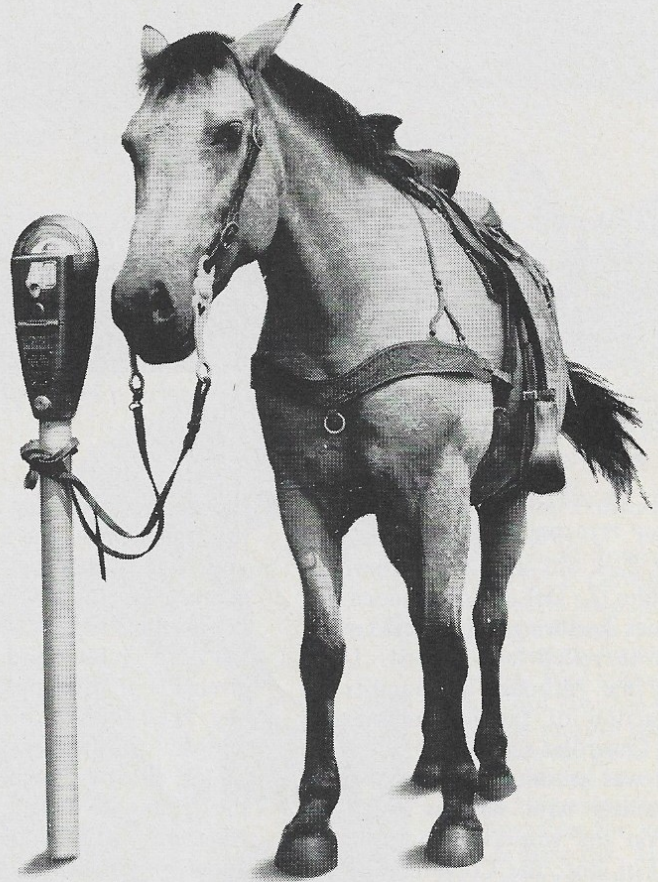
We, at Renault, are one of the few automakers to make a car that's better than the horse.

The Renault 10.

Since it gets 35 miles to the gallon, it is cheap to run.

And since it has independent suspension and disc brakes, it is sure-footed and easy to stop.

And since it is maneu-



verable, it is easy to park.

And since it costs \$1,725*, it is easy to buy.

And it is also more comfortable than the horse.



RENAULT 

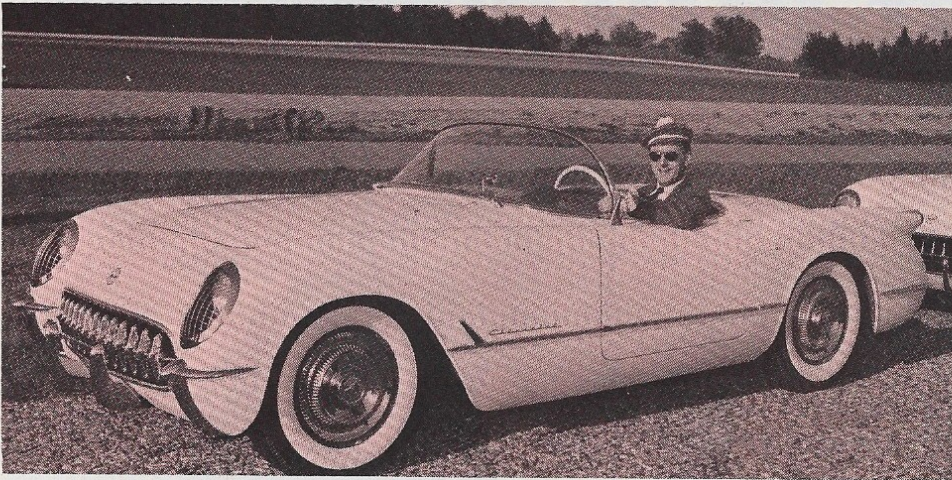
For nearest dealer see Yellow Pages or write Renault Inc., 100 Sylvan Ave., Englewood Cliffs, N.J. 07632. *P.O.E.

WORLD NEWS

(Continued from Page 8)

as though some Corolla owners shifted a little too eagerly and ended up with a

broken lever in their hands. All owners involved have already been notified by certified mail.



WCG's editor, Don MacDonald, sits behind the wheel of a 1954 Corvette. Picture was taken at the first press preview for the make.

CORVETTE ANNIVERSARY... On November 7, 1969 the Corvette was 250,000 cars old and even Chevrolet prexy John Z. DeLorean attended the ceremonies honoring the milestone vehicle as it rolled off the St. Louis assembly line. Although this number is a small fraction of the 40 million cars built by Chevrolet since 1953 when the Corvette was introduced, none of these other models have had as much influence on the world's automotive industry. For one, the Corvette was the first car to be put in series production with a fiberglass body and I can well remember the rumors spread by competition. A choice example of the nonsense bruited about was that if you had a minor collision in near zero weather, the entire body would disintegrate into

tiny particles, leaving you sitting on the pavement with the steering wheel in your hands. Another Corvette first, of course, was the revival of the personal car on these shores, six months ahead of the Ford Thunderbird which is generally given the credit. Top Corvette sales year was 1968 with 29,874 delivered and as you know, this coming February will see an all-new design which is actually the '71 model moved up by a half year. Nine out of 10 Corvette owners are under 34 years of age and 62% are understandably single. This two-seater package which sells for upwards of \$6000 is a pretty expensive toy for a family man. A 1954 Corvette sells today in restored form for about \$2500 and there are 200 active owner clubs in the U.S. and Canada.



Rolls-Royce's new U.S. home in Paramus, N.J. features a replica of the famous radiator shell mounted over the doorway.

ROLLS-ROYCE EXPANDING... Strangely enough Rolls-Royce, Inc. admits that it has a spare-parts

supply function and has proudly unveiled a new building in Paramus, N.J., to house it. Instead of the usual computers which are hardly necessary, the

structure features an aluminum sun screen over the entrance fashioned into a replica of the classic R-R radiator shell complete with insignia. Total employment is 45 persons to care for the needs generated by the 3703 cars registered (as of January 1, 1969) here. Two-thirds of these, incidentally, date back to 1963 or earlier with approximately 360 new ones being added to the total each year. The total includes Bentley T's which are identical mechanically and in all other respects except for the radiator shell.

PORSCHE-AUDI DEALER NETWORK FORMED...

Fourteen regional distributors and 150 dealers were in the combine when Porsche-Audi opened its doors for business this November 1st. Headed by John E. Reilly, formerly general sales manager of Volkswagen of America and run as a division of that concern, the fledgling newcomer ambitiously hopes to sell 50,000 cars in 1970 through the 205 dealers expected by mid-1970. It's no secret that considerable pressure was put on existing VW dealers to take on the line at an average investment of \$400,000 for the required separate facilities, although the euphemism went that they were being "offered it first." In any case \$45 million was added to the economy by expenditures so far. Cars to be marketed include the Audi Super 90 in two- and four-door sedan and two-door wagon form, the Audi 100LS in two- and four-door sedan form, the usual variety of familiar Porsche 911's and the all-new mid-engined Porsche 914 in four- and six-cylinder form. I sometimes wish I were a Volkswagen dealer and had to say "yes" to this largess.

NEW HAVEN BUYS SAABS... I'm sure it wasn't just the fact that SAAB USA, Inc. is headquartered there that caused the City of New Haven to lease 18 cars — four V-4 wagons and 14 SAAB 96 sedans — for the use of various departments. You'll not find police in them, though, as SAAB's aren't quite up to chasing errant Detroit iron. SAAB is one of the few importers that actively encourage its dealers to participate in the leasing business by providing support in the areas of financing, education and promotion. I've often wondered why companies like SAAB don't try harder to make deals with car rental agencies. This would be a cheap and convenient way of demonstrating their wares to a public that may be aware of the Volkswagen in the import field but not much else. On

(Continued on Page 60)

“...I used more STP than the other guys”



Indianapolis, May 30—
For 500 miles, at a record-breaking speed of 156.867 miles per hour,* Mario Andretti's car endured more punishment than your car's engine encounters in a lifetime.

The whole winning way, STP® products gave Andretti the racer's edge.

STP Oil Treatment cut friction and wear to keep heat down.

And STP Gasoline Treatment helped him get the mileage he needed to finish, kept his fuel system clean and trouble-free, kept his engine tuned as he drove, gave him the go-power to win.

Get the winning combination for your own family car. Have your service station add STP Oil Treatment and STP Gas Treatment today. And run racer sharp.



THE RACER'S EDGE

*Certified by



For Andy Granatelli's best-selling book, "They Call Me Mr. 500," send \$6.95 to: Book, P.O. Box 500, Des Plaines, Ill. 60018

Road Test

CAR AT A GLANCE: Four more horsepower... Higher power peak... Cracks the 20-second barrier from zero to 60... Traditional beetle quality overall and in detail... Traditional beetle wind bobble.

by Don MacDonald
photos by Lester Nehamkin



Except for the slim tires the beetle is just as much at home on bad roads as any dune buggy. Acceleration on washboard is free of hop.

1970

VW SEDAN...Stock Long Legs at Last!

The people in Englewood Cliffs who import Volkswagens enjoy making fun of their product, even to the extent of compiling anecdotes and distributing them to 3.5 million owners via the publication "Small World." Beneath the surface of this levity, though, lies the certainty that someday the bubble must burst.

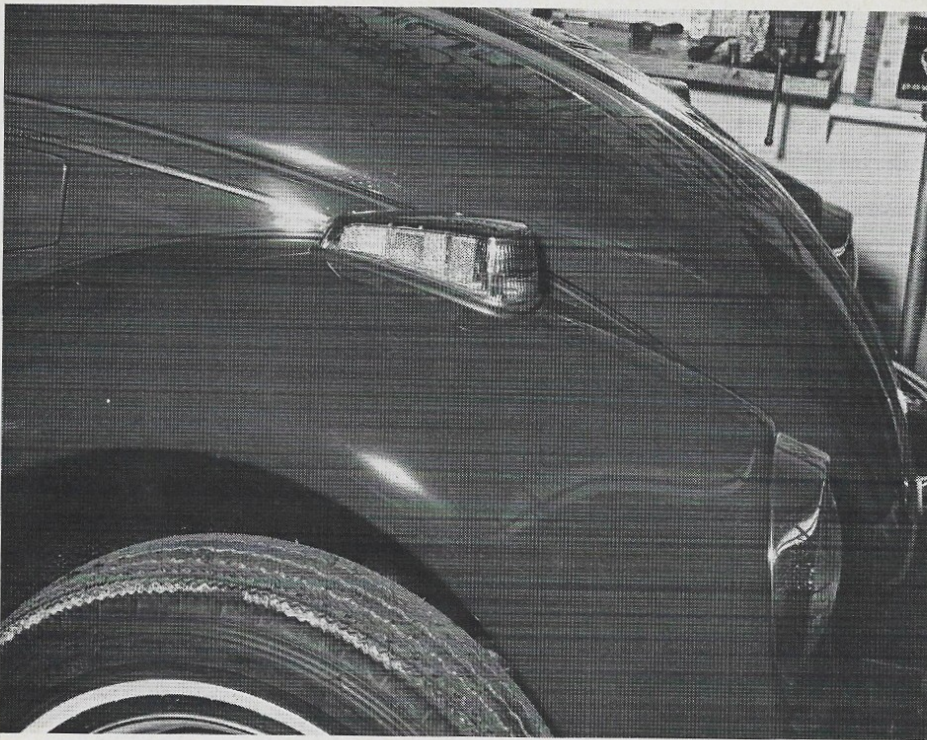
The factory people in Wolfsburg do not indulge in or even understand this brand of humor but they, too, are aware that a 25-year idyl must someday end. Thus we see efforts at diversification such as the purchase of NSU and Audi and a renewal of component inter-

change with Porsche. We see new models such as the 411 and the 181 utility, plus first official recognition that dune buggies exist. The fact being faced is that beetle sales seem to have reached a plateau in world markets and, if you can sort out extraneous factors such as uncertain currency, dock strikes and the like, there's even indication of a slump in the offing.

A styling department has been created but it's doubtful if they'll ever be called upon to bestow new sheet-metal on the beetle. They could create an all-new car, of course, but they can't restyle a syndrome. Thus, the beetle's

survival has been left in the hands of the engineers and as a result, more basic changes have been made in the last four years than in the 21 others of its existence combined. This model season in particular sees a beetle that's good enough to break out of the cult and woo buyers who never considered the car seriously before.

I'm speaking specifically about performance as it pertains to U.S. driving conditions. The premise is that a certain modicum of acceleration is necessary both for your own safety and to facilitate the flow of traffic. Though zero to 60 mph figures are generally



Enlarged turn signal and parking light, the latter on with headlights, is a little too bright, reflecting on highway signs a 100 feet ahead.



The new slots in the engine lid are essentially the same as used on the convertible but may affect usage of luggage racks. No advice is available on this.

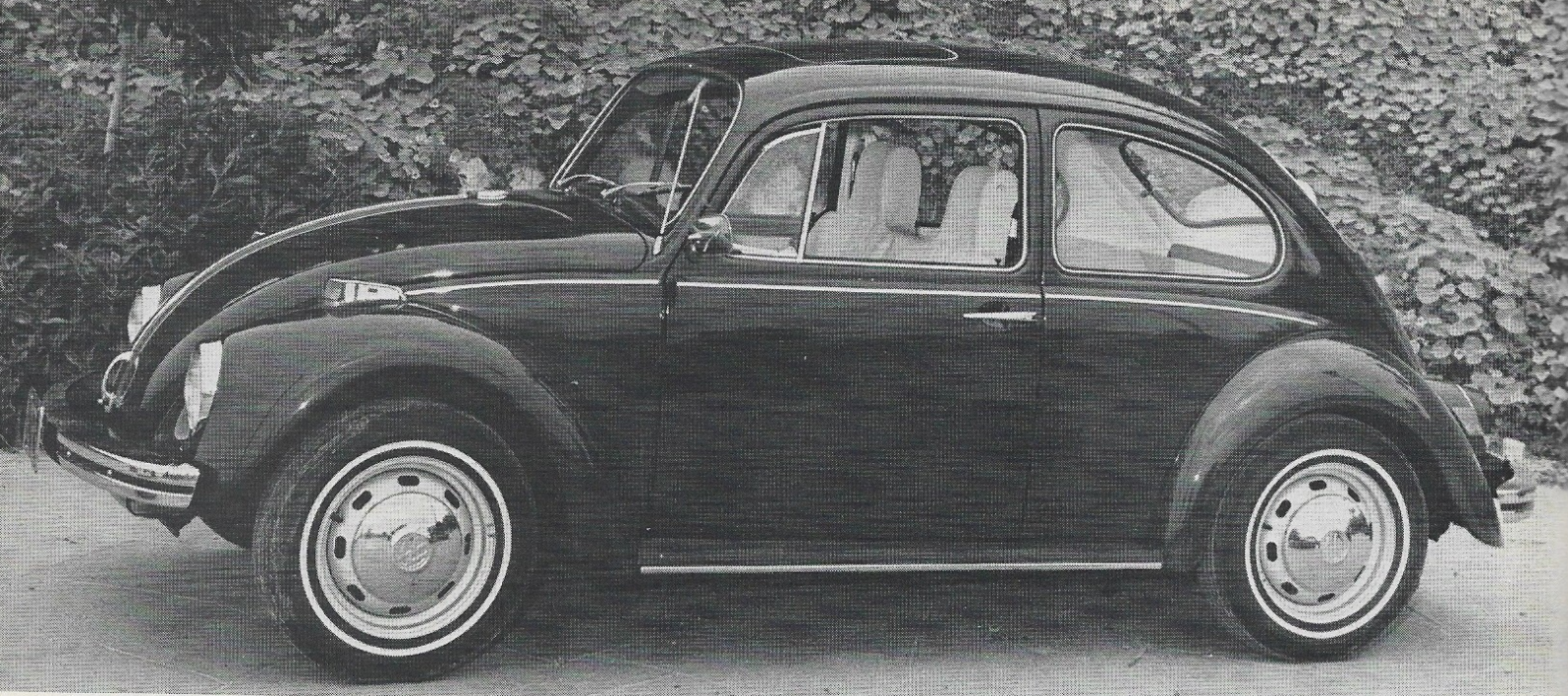
meaningless on the street, they are widely available for any car and they translate to the meaningful — yea, vital — 50 to 70 mph passing range. Just three years ago, the VW 1500 was the most sluggish of 10 popular imports in its general price range by factors ranging from 1.2 to 8.6 seconds in the zero to 60 department and 1.1 to nearly 10 seconds for passing. Those 10 or even 1.1 extra seconds of exposure to oncoming traffic while you pass a truck could prove rather meaningful to your welfare plus that of innocent others.

The 1967 stickshift beetle with 53 horsepower and weighing 1880 lbs. required 20.6 seconds to achieve 60 mph from a standing start and 18.1 seconds to move from 50 to 70 mph. The 1970 version with only four more horsepower and about the same weight accelerates from zero to 60 in 18.2 seconds and will perform the passing increment in 16.2 seconds. These improvements may not seem like much, but they move the beetle up from a solid last among imports to about midway in agility. The difference stems from both horsepower and torque peaking at significantly higher rpms.

On the way from Las Vegas to Los Angeles via Interstate 15 there's an import killer of a grade just before the town of Baker called Halloran Summit. It's not higher than some of the others on the route, just steeper. Our test VW 1600 climbed this in 4th gear and never dropped below 50 mph. I know of no earlier stock beetle that isn't forced to shift to 3rd at 40 mph, unless the driver is totally insensitive to a laboring engine. For clarification, this comparison of the two cars involves only a driver and a couple of suitcases.

Another desirable consequence of moving the power peak ahead is that the '70 beetle sounds a lot happier cruising at 70 mph than it does between 55 and 65 mph. The factory quotes 83 mph as the maximum for the new model, but we all know that any beetle of recent vintage will do that — at least according to the speedometer. The new one, though, will wind up to where the needle covers the oil warning light on a long straight. That should be an honest 90, shouldn't it?

The beetle syndrome consists partly of tolerating traits that would cause lesser imports to be rejected out of hand. And to be fair, these traits are undoubtedly tolerated in return for larger benefits such as unmatched durability and the little matter of getting almost as much for the car second-hand as you paid for it new.



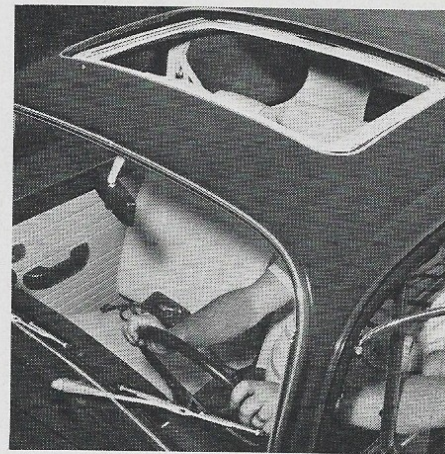
Appearance changes for '70 include larger auxilliary lights plus some extra slots in the engine lid. Inside, those towering head rests have been slimmed a bit.



Vulnerable Porsche-like reflectors are a '70 addition, as are the tubes to drain water that might seep in from the slots in the engine lid.



Instrumentation and trim is carryover. Large ignition key which locks the wheel is still sometimes difficult to insert.



Optional sunroof is leak and dust proof, operates easily. When open it helps alleviate harmonic drumming experienced at highway speeds.

Those I speak of that peeve the most are wind wobble and that oppressive harmonic drumming somewhere in the headliner that occurs at varying highway speeds and window settings.

Nothing has been done about these for the new year. Despite its relatively new fully independent, semi-trailing arm rear suspension the '70 beetle *seems* to bob about as much as ever in gusty crosswinds or from the air blast of a passing truck. However accustomed one becomes to this, it is nevertheless tiring to driver and passengers on a long trip. We should emphasize, though, that our experience over the years invariably has

involved low mileage cars. VW experts note that the bobbling tends to diminish after the suspension "softens" at the 6000-mile mark or thereabouts.

The harmonic drumming is undoubtedly related to a lot of variables such as body shape and size, upholstery and deadening materials and also, of course, constantly shifting relative winds and the position of the windows. The fact remains, though, that there are other small cars that don't create this racket so there must be a way of getting rid of it. Perhaps if factory engineers and executives had their company Karmanns and 411E's taken away from them and

were forced to drive beetles for a spell, then they would come up with a solution.

Checks on fuel consumption resulted in figures that are familiar to most beetle owners. We recorded a low of 20.9 mpg which was a combination of heavy traffic and high-speed Interstate driving. Our best figure was 28.6 mpg on an Interstate run where speeds were kept to the legal 65 mph night limit. During miscellaneous driving with no attempt at achieving maximum economy, but not beating the car either, you can expect the usual 25 mpg. It should be remembered, though, that we re-

VOLKSWAGEN 1600 SEDAN

Specifications from the Manufacturer

ENGINE:

Type: Rear-mounted, overhead valve, horizontally opposed four, air-cooled.

Bore and stroke: 3.36 x 2.72 ins.

Displacement: 96.66 cu. ins. (1584 cc)

Horsepower: 57 @ 4400 rpm

Torque: 81.7 lbs. ft. @ 3000 rpm

Compression ratio: 7.5 to 1

TRANSMISSION:

Type: 4-speed fully synchronous manual, 3-speed semi-automatic optional.

Gear ratios: 1st-3.80, 2nd-2.06, 3rd-1.26, 4th-0.89

Rear axle ratio: 4.125

SUSPENSION:

Front: Independent torsion bar with stabilizer

Rear: Fully independent torsion bar, semi-trailing

STEERING: Roller, curb-to-curb 36 ft.

WHEELS AND TIRES: Bolt-on steel disc with 5.60 x 15 bias-ply tires

BRAKES: Dual-circuit hydraulic drum

CAPACITIES:

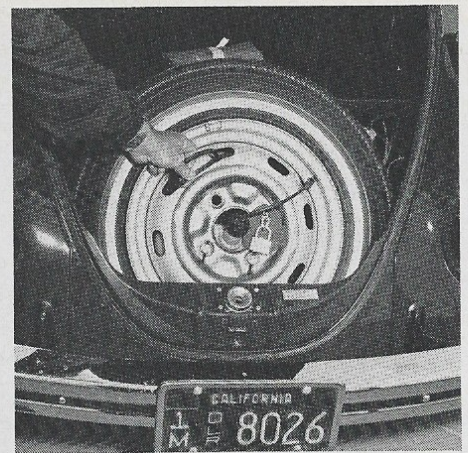
Fuel: 10.6 U.S. gals

Oil: 2.5 U.S. qts.

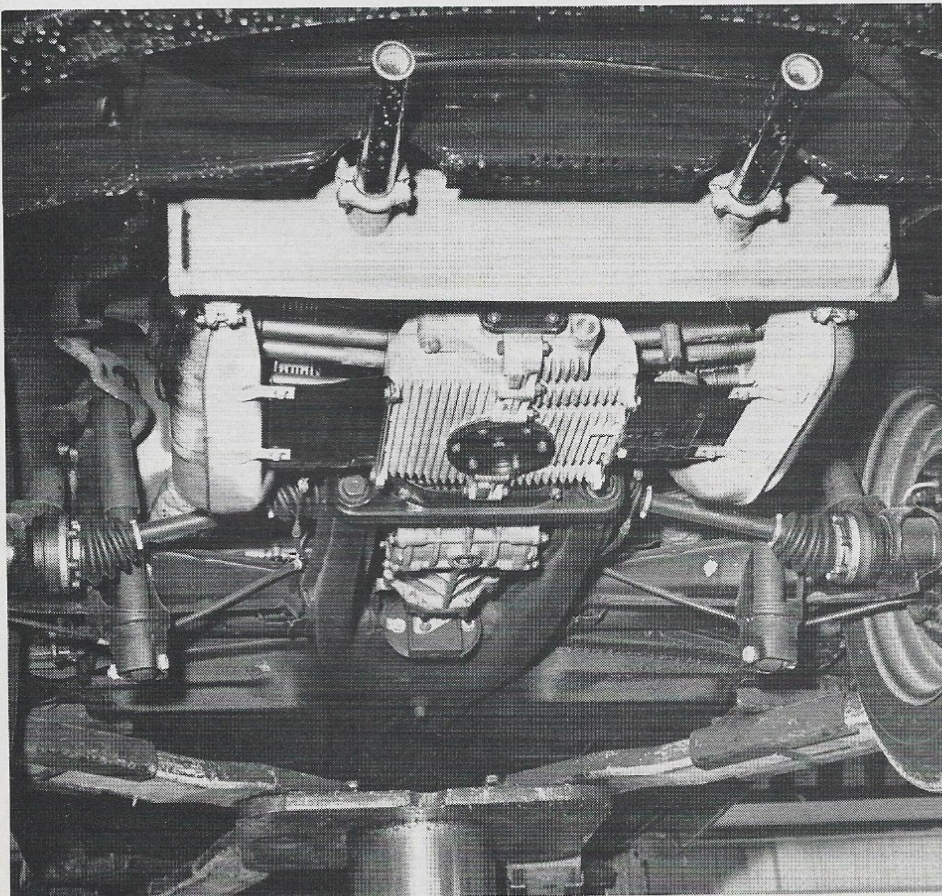
Transmission: 5.3 U.S. pints

BODY AND FRAME: Steel body, platform chassis

DIMENSIONS AND WEIGHTS: Wheelbase 94.5 ins., Overall length 158.7 ins., Width 61.0 ins., Height 59.1 ins., Weight 1808 lbs.



Spare fan belt is still standard equipment along with a tool kit. That padlock is installed on all company cars owned by Volkswagen Pacific.



The underside of the '70 model will be familiar to the owner of any recent beetle. Stone guards on shocks were added some time ago.

ceived the car with nine miles showing on the odometer and turned it in with 1065 miles. Economy naturally tended to climb as the motor wore in. When the car went in for its somewhat delayed "600-mile" check, the crankcase showed a consumption of one quart. Sometimes I wished oil were sold in pint containers, for these last 300 miles across the desert with the dipstick reading just above the "add" mark and a crankcase containing only perhaps 1.6 quarts of "break-in" oil was a little disconcerting. It's either pints or VW should install a metered oil reservoir.

Perhaps an owner would have drained and refilled at the proper time at a convenient gas station but VW frankly had me intimidated with the seriousness they attach to the first lubrication. It's not so much the engine oil but the requirement to drain and refill the transmission at the 600-mile point. The average nighttime attendant at a desert station might not be adept at this, mainly because from thereon in, the SAE 90 hypoid oil is theoretically good for the life of the car.

Any discussion of beetle handling would not only be redundant but foolish. Vigorous pursuit of the point of no return in an unfamiliar curve all too often ends up with a toppled bug, wheels spinning futilely in the air. When a pound of tire pressure, one way or the other, can affect your insurance rates for years to come, I'll leave this

(Continued on Page 56)

Road Test



Matt black paint around the headlights and vinyl-covered "C" post distinguishes the 94-hp GT Alpine. Car is drum-tight on rough terrain.

SUNBEAM ALPINE GT... PEPPY LUXURY FOR \$2535

CAR AT A GLANCE: British traditional trim and better performance at bare-bones Mustang price . . . Fully instrumented . . . True 4/5 seater . . . Unruffled straight-away ride . . . Not quite GP cornering.

**by Don MacDonald
photos by Lester Nehamkin**

The history of how the present Alpine hardtop came to be is an interesting excursion into the conflicting demands of the English and American markets and also, it's a rare example of the dollar hungry British favoring their home market.

The predecessor Alpine was a two-seat roadster first introduced in 1960. It did very well in the U.S., particularly after Ian Kerr, the West Coast distributor, shoe-horned a 164-hp Ford V-8 into the car in a manner neatly enough to enable mass production. Both versions,

however, were slow sellers in England where there is a definite trend away from open two-seaters.

With the infusion of Chrysler capital into Rootes, the Alpine was redesigned completely and the present 4/5-passenger fastback form appeared in 1968. Despite Rootes being a Chrysler subsidiary by that time, the new Alpine was styled without a thought to the formerly lucrative U.S. market, even to the extent that for many long months it was unable to pass various U.S. safety and emission control requirements. Sales here thus dwindled to almost zero and the dealer network disintegrated.

Corrective action was taken by mid-1969 and our test car, a '70 model, is of course, fully legal in every respect. Paradoxically, the nearly two year hiatus works in the present car's favor. It drew curious viewers in gas stations and parking lots and stares at traffic lights simply because it has been scarce enough to be almost unknown. Another benefit from the reorganization is that sales are now handled by the Chrysler-

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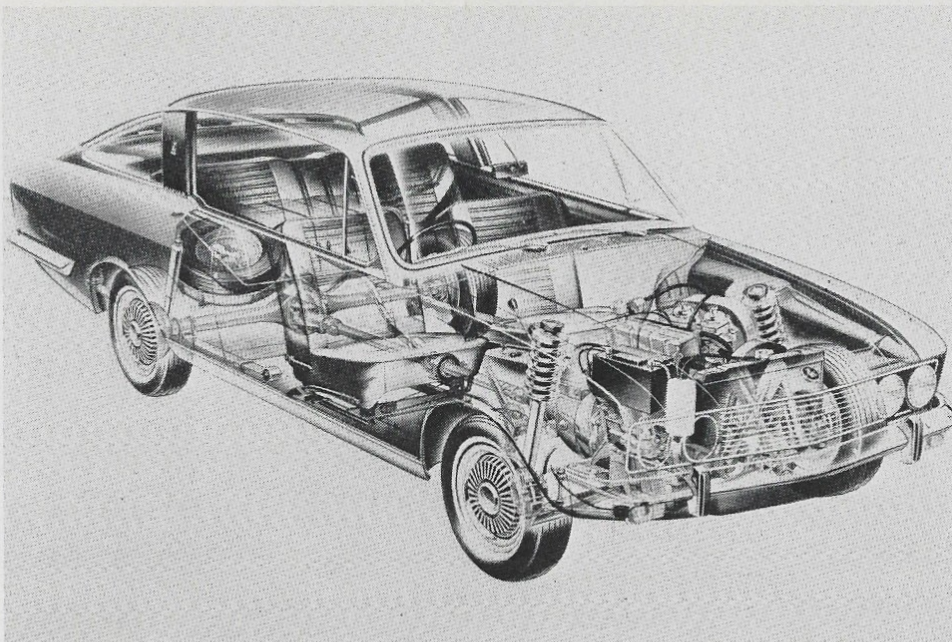
JANUARY/1970



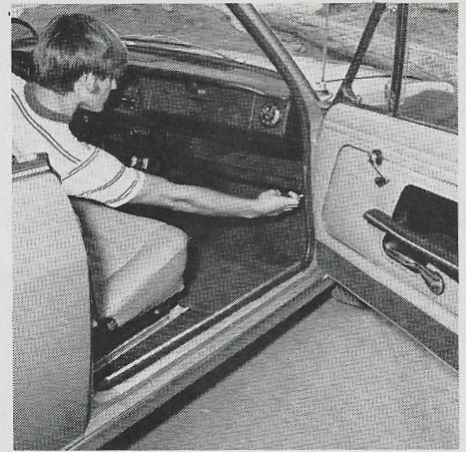
Dual exhaust outlets are just an extension from the resonator. Nice-looking "mags" are a Bud Shroeder design carried over from the original Alpine V-8.



Towering buckets don't help rear vision much but comply with U.S. safety regulations. Wrap-around bumpers adequately protect the car in parking lots.



This cutaway from British sources gives you an idea of the coil and strut front suspension and the chair-height room offered by the interior.



With all the expense of converting to left-drive for the U.S. market, you'd think they'd move the hood release over. As it is, it's a knuckle duster.



Dash is full instrumented including standard tach and clock and is trimmed in genuine wood veneer. Under it is a nearly full-length package shelf.

Plymouth Division and given a little time, you can be sure that the quality and availability of service will be brought to Big Three standards.

At roughly \$2500, the Alpine GT invites comparison with a wide variety of cars ranging from the diminutive new Fiat Racer, the VW 1600 or a

bare-bones six-cylinder Mustang to the somewhat more versatile Renault 16 sedan wagon. It will out-perform any of these and is at least as economical as any but the Fiat. In addition there is more interior room than any but the Renault and if you judge by such niceties as wood trim, full instrumentation and leather-like vinyl, again only the Fiat is equally equipped. By the pound, the Alpine costs \$1.09, the Fiat \$1.52 or almost 50% more.

The 94-horsepower, twin-carbureted Alpine GT four is the same engine used in the prototype Hillman Hunter that won the 10,000-mile London-Sydney Marathon a year ago December. It's a long-legged little 1725-cc (105.2 cu. ins.) unit that's amazingly quiet at anything below 5000 rpms, but amazingly noisy in the 300 rpm increment thereafter to the redline. We got zero to 60 in 12.9 seconds once by peaking in each gear up to 3rd where you don't quite need all of it, but 14 seconds or so is a more realistic figure for drivers with a modicum of mechanical empathy. Whether you own or just borrow the car, you tend to stay at 5000 or below.

Another problem with consistently fast starts is torque stall. To avoid it in a maximum start requires revving to at least 2500 before finessing the clutch, and with the proper finesse comes the ominous smell of hot clutch lining. Despite its evident agility, the Alpine GT is not likely to be popular in NHRA competition. Relining hydraulic clutches is not a subject taught in elementary mechanical courses.

With 70 mph appearing at a relatively

SUNBEAM ALPINE GT

Specifications from the Manufacturer

ENGINE:

Type: Front-mounted, overhead-valve four, water-cooled with aluminum head and cast-iron block

Bore and stroke: 3.21 x 3.25 ins.

Displacement: 105.2 cu. ins. (1725 cc)

Horsepower: 94 @ 5300 rpm

Torque: 105 lbs. ft. @ 3100 rpm

Compression ratio: 9.2 to 1

TRANSMISSION:

Type: 4-speed fully synchronous manual, 3-speed automatic optional

Gear ratios: 1st-3.35, 2nd-2.14, 3rd-1.39, 4th-1.00

Rear axle ratio: 3.57

SUSPENSION:

Front: Strut-mounted independent coil

Rear: Semi-elliptic leaf, live axle

STEERING: Non-assisted Burman recirculating ball, ratio 16.8 to 1, curb-to-burb 34.1 ft.

WHEELS AND TIRES: Bolt-on steel disc with 165 x 13 Dunlop radials

BRAKES: Servo-assisted front discs, self-adjusting rear drums

CAPACITIES:

Fuel: 18 U.S. gals.

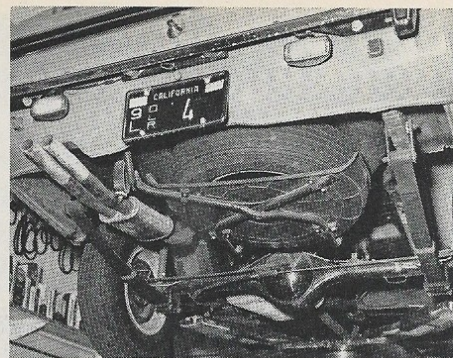
Oil: 4.5 U.S. qts. with filter

Transmission: Manual-4.2 U.S. pints, Automatic-13.5 U.S. pints

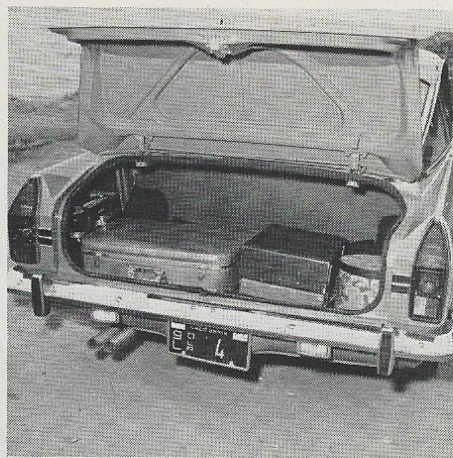
Coolant: 16.5 U.S. pints

BODY AND FRAME: Integral steel

DIMENSIONS AND WEIGHTS: Wheelbase 98.5 ins., overall length 174.5 ins., width 64.7 ins., height 53.5 ins., weight 2310 lbs.



Exposed location of spare helps trunk room but could lead to a messy tire changing job, especially in winter. It's released from above by a nut in the trunk floor.



Trunk capacity is far greater than any U.S. pony car despite the shorter wheelbase and greater interior legroom. It's also dust-proof.

lazy 4000 rpm in fourth, the GT is obviously a car at home on the Interstate. There is neither engine nor wind noise at this speed and more importantly, the car bores through gusty crosswinds as though they were table-soft margarine. One time as we were tackling a long two-lane grade, a big bass-mouthed Kenworth went by us downhill in Mexican overdrive. He must have been doing ninety and while the GT seemed to almost stop dead for an instant in the blast, it never moved out of its tracks.

Front suspension is by high coils wrapped around huge shock absorbers that function as struts. Factory literature says that these "have an extremely long life partly due to their ability to dissipate heat" which is good for I'd hate to have to buy a set every 10,000

miles. Rear springs are conventional leaf with the kind of shocks that the Pep Boys stock.

Just from the description, that wouldn't sound like a combination to give a sophisticated ride equalling that of an Alfa 1750 and approaching the standards of a Renault 16 or Citroen DS. Yet, such is the case. Our test route takes us through a town that relies on gravity to solve its drainage problems and every block is crossed by a paved waddy. It's our normal procedure to hit these at 40 mph, a speed that bottoms the front and rear of American pony cars with the so-called competition suspension option. While the GT didn't exactly let these pass unnoticed, it went through without shock, taking it as if it were a Citroen with the levelling system disconnected.

The GT is an obvious candidate for wider rims or even reversed rims to make the effective track at least equal to its 53.5-inch height. As it comes from the dealer, it's undersquare with a 52-inch track front and rear. Thus, its very real cornering abilities are somewhat tempered by a vague feeling of top-heaviness, augmented in part by the chair-height seating.

The car is understeer to the extent that tire scrubbing is mildly transmitted back through the wheel, and that is as it should be for a sporty mount not meant to be raced even on its Dunlop radials. I won't say that it would corner better but I have a hunch that it would "feel" better on ordinary tires, as flexible sidewalls make you seem to tip more than you actually are.

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Road Test



Front-wheel-drive, 105-mph Audi 100LS should prove to be the volume item of the newly founded Porsche-Audi dealerships in the U.S.

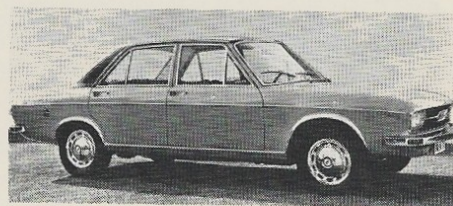
AUDI TOOLS... THE

by Sloniger

CAR AT A GLANCE: Valiant/Falcon sized family tourer with Benz luxury... 105 mph top at 20 mpg... Non-grabby front drive... U.S. bound at maybe \$3000 minimum.

seconds and burns less fuel while providing more comfort than a Can-Am racer by fair margins. It also can wear even Connecticut plates and can be driven by your wife.

After tucking nearly 1500 test miles with a 100LS under my belt I began to believe that this front-drive, 1760-cc, slant-four of almost diesel compression could in fact grace the American market very neatly. This is chiefly because it comes on more as a baby Mercedes (by whom it was designed) than stretched VW.



Audi is fast becoming Germany's favorite taxicab which is actually a compliment. Witness Plymouth or Dodge in the U.S. which both win races and hack.

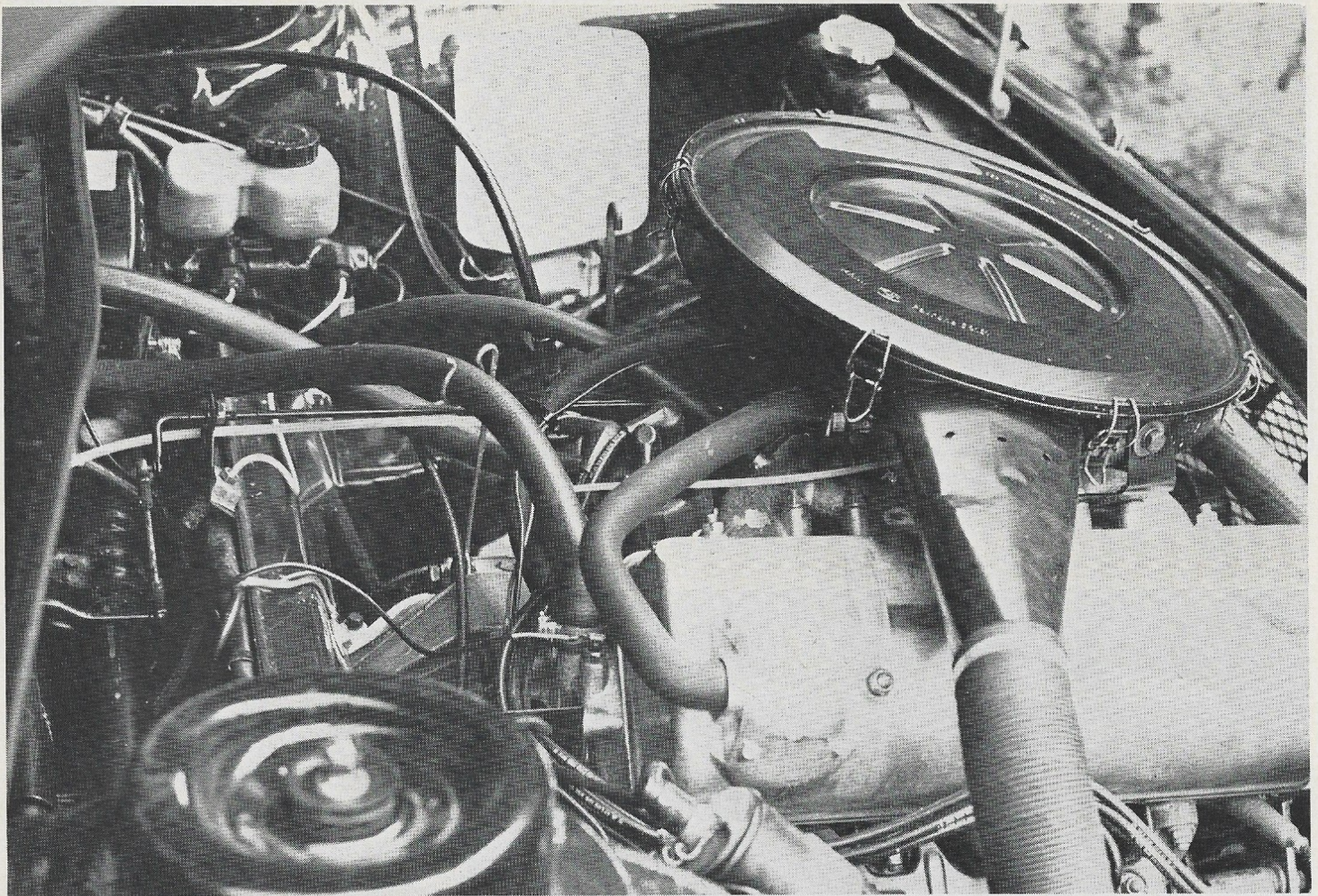
They even run that Can-Am 917 spyder as a "P-A" for Porsche-Audi as a preliminary for the high speed advertising to come.

The 100LS doesn't claim to be quite so quick as all that but it does shift along in the 105-mph class, gets to 60 from a standstill in just under 12

On a 105.3-inch wheelbase and measuring 180.7-inches overall, the Audi is hardly a mini-car. Price is targeted in the \$3000-\$3500 area.

Those few of us left that have studied Latin know that "Audi" stems from the verb 'to hearken,' right? Well, listen in to this. No less a big daddy than VW of America has decided via its Wolfsburg parent to make the best of Audi, a mid-range spearhead for America, and the new contingent of 150 exclusive Audi-Porsche dealerships.

Beginning January 1st, 1970 the S90 Audi and new 100LS will be brought in and they're talking about 50,000 sales a year with nearly half of those from the big 100LS in two- and four-door form.



Tilted four of 115 SAE hp sits in a maze of plumbing. Yet it gets from zero to 60 mph in around 12 seconds and is fairly happy up to about 5500 rpm.

ONE FOR THE U.S.

There are two qualifications to that finding, one of which is that engines react very individualistically to smog controls and ours was not so encumbered. Also European driving is more cut-and-charge-through than U.S., though most of our miles were stacked up in France which comes closest to police-scarce, non-freeway America.

Back when the first middling-high compression fours were developed as a means of reversing a two-stroke slump around Auto Union, Mercedes ruled Audi and DB/engineers produced the motor of fantastic compression ratios for a sedan. Then the line was sold to Volkswagen where it prospered mightily. Waiting lists run to months, not weeks, now and Wolfsburg had to quit assembling beetles in the Audi plant to make room for more 100s.

VW kept the robust engines but lost none of their name for solid assembly. A 100LS (smaller 100's without the initials are proportionately less powerful but they won't go to America anyway)

feels chesty, runs hard all day and is big-car quiet until you get near the rev limits where no Audi really likes to dwell.

If they can tame the thirst, this could give the solid steel class in America fits, particularly with VW-organized if not directly managed service and reputation. Pairing Audi with Porsche gets both halves of the two-car clan into one showroom in a pincer any clam would envy.

Despite a good sized 15 gallon fuel tank which is fed by a miniscule filler neck that inevitably regurgitates the last quart, this Audi 100LS was no grand tourer in the logistical sense. I rarely got over 20 mpg despite factory claims of above 26 U.S. gallons per mile.

On the other hand, France allows 100-mph runs of a half an hour or better between its choked towns and that is hardly camel country. With U.S. speed nooses I'd agree to maybe 25 mph regularly in a true 4/5 seater. Our two quarts of oil in 1438 miles was

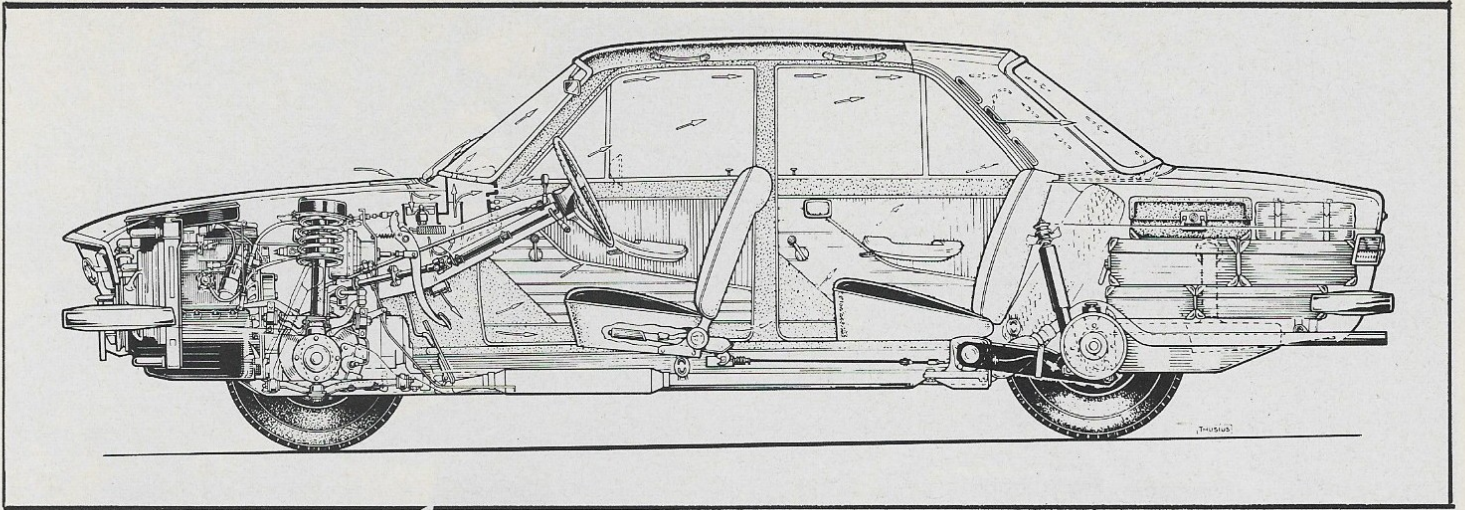
undoubtedly unique to the test car.

The engine proceeds almost unnoticed until you get close to the 6200-rpm redline. There is a tach but it's really redundant for the class driver they expect and the dials have a faintly early-Porsche flavor. Even with compression "down" to 10.2:1, it is more a heavy-duty slogger than a singer, though less ponderous than some very early Audis.

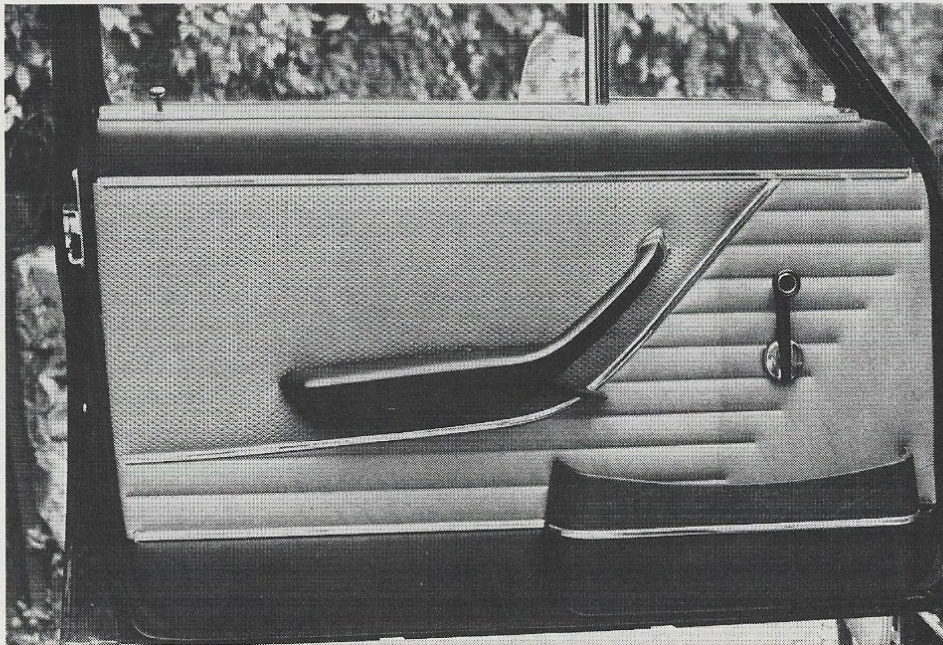
Torque in this 115 SAE hp mill is a solid 120 lbs. - ft. peaking down at 3200 rpm. With more stroke (84.4 mm) than bore (81.5) and a single 35 Solex carb, they wisely geared the car for 75 in 3rd and built in natural-born overtaking ease.

You can even order an optional floor shift though the column lever suits the car's temperament and trim. What's more, column levers work at least as well if not better with front-wheel drive anyway.

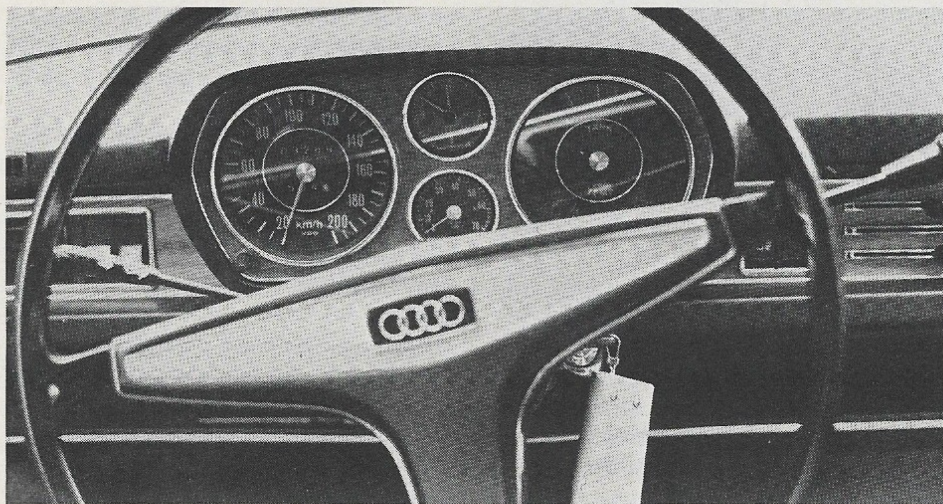
On the subject of trim, our car had a thin plastic wheel but I note that the



Cutaway is mainly intended to illustrate the new flow-through ventilation system (arrows), yet it shows the general mechanical layout.



Trim represents both solid quality plus practicality such as the integrated pull handle and map pocket. Hopefully, U.S. trim colors will be brighter than the Germanic.



100LS instrument panel could be but isn't fully gauged. Minuscule tach sits above the Auto Union emblem on the wheel, there are gauges for time and gas, but the rest is idiot lighted.

P-A list of standard equipment includes genuine tree lumber there. The panel is well done in wood too. Then, tucked into their list of nearly four-dozen standard items — most of which had damn well better appear in this class — are some fine features for long-distance travel.

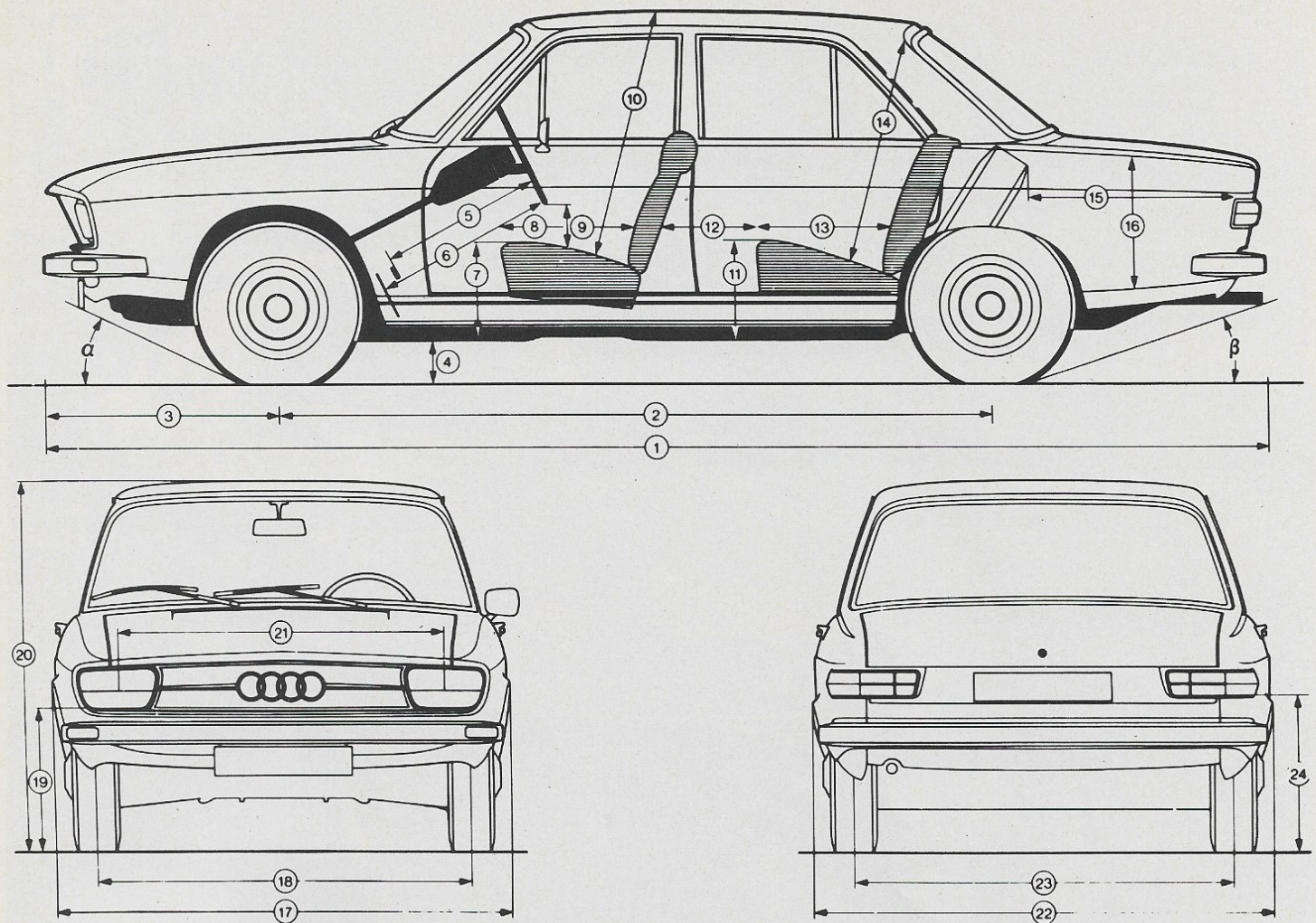
I'm always predisposed to plenty of under-dash shelving as well as door pockets, a trip recorder, double reversing lamps and a heater/blower that really demists on partial power.

Even with the nicely wrapped-around and reclining front seats pushed right back for outstretched drivers, there is good rear knee room in their 105-inch wheelbase and the trunk swallowed small step ladders, multiple camera bags and travel luggage like a proper tourer.

Despite this rich interior space the car remains a reasonable if not astounding 182-inches long and manages a really amazing 36 ft.-10-in. turning circle, made even easier by its light and progressive steering. In fact, for front drive and an engine ahead of the action the city handling and dimensions were first rate.

Frankly, I was never tempted to find the true and absolute high-speed handling limits of this 2300-lb. automobile and its fwd. There is sufficient torque coming out of a bend, particularly with a quick downshift, to make it unnecessary that you seek the last fraction of lateral grip in the corner proper.

Initial posture is certainly understeer but there are those who find this safer for family transport. And the Audi 100LS is basically so neutral that I doubt if most drivers will realize which end is driven, or even care. Sporty types would want more sheer power/weight to



Measurements of Audi's 100LS, keyed to the numbers and all in inches are:

1 - 180.7	5 - 23.8	9 - 5.9	13 - 19.3	17 - 68.1	21 - 48.4
2 - 105.3	6 - 26.4	10 - 35.8	14 - 34.2	18 - 55.9	22 - 68.0
3 - 34.7	7 - 13.4	11 - 14.2	15 - 30.7	19 - 22.6	23 - 56.1
4 - 6.4	8 - 19.2	12 - 15.0	16 - 18.7	20 - 55.9	24 - 24.3

AUDI 100LS...

pull the nose around if they should overcook things, but sporty types aren't the buyers that Audi-Porsche anticipate in America.

The 100LS handles much like a more-compact kind of U.S. car with better suspension options, top-line brakes in that context, and a good ride

even over potholes. It isn't a true speed leader for the \$2350 class in Germany but it's at least above average, long-legged about its performance and cheaper than most homeland peers.

You would almost think Audi had designed the 100LS, their top seller these days despite cars costing a third

less in their own catalogue, for America. It might not be the absolute winner in passenger size, low price, top speed or any other specialized category but it is an adroitly balanced blend of price, performance and prestige - tailor-made for that special pigeonhole between big Volkswagens and small Mercedes. ●

NEW CARS FOR 1970



The all-new Datsun 240Z is a people-sized car for two that is claimed to top 124 mph. Selling for an amazingly low \$3500, it will be available here soon.

DATSUN...STARRING THE 240Z SPORTS

240Z Sports

One of the best kept secrets in recent automotive history was Datsun's 240Z Sports, a car first unveiled simultaneously at the Tokyo Motor Show and to U.S. dealers on October 22nd and 23rd, depending upon how you reckon the calendar.

It is also, at a projected price of \$3500, as great an aesthetic and mechanical bargain as was the XK 120 Jaguar two decades ago. The 240Z is not only supremely good looking by any standard but when scaled to two passengers, it approaches U.S. definitions of dimen-

sion. It is on an 89.9-inch wheelbase and measures 161.3-inches long, 63.6-inches wide and 49.1-inches high. Comparable Corvette dimensions are 98, 182.5, 69, and 47.8 inches, respectively. Unlike the Fiat Sport Racer, it is people proportioned as well as pretty.

Power comes from a new-to-the-U.S. sohc in-line six rated at 150 horsepower which drives through a standard, fully synchronized four-speed gearbox. One would wish it could have been a fiver to give an overdrive and of course a growing percentage of those who buy a car of this type, if Corvettes and AMX's are any indication, actually prefer an

automatic. Other mechanical features include a 3.364 final drive, an over-square 3.24- x 2.87-inch bore and stroke, rack and pinion steering, front disc brakes and twin SU-type carburetion by the Japanese licensee, Hitachi. A radio and radial tires are standard equipment. Complete, the all-steel two-seater weighs 2238 lbs.

Re-Powered Pickup

The unexpected popularity of the Datsun pickup with campers is undoubtedly what forced adoption of the 1600-cc, 96-hp sohc four introduced with the 510 passenger series in 1968. This gives a 40% increase over previous truck power. Other than this, Datsun's pickup, No. 1 import of its type, is not changed for '70. It's the only Datsun other than the roadsters with frame-type construction and unlike most U.S. pickups, a fully synchronized four-speed transmission is standard along with

whitewall tires, package shelf and tie-down hooks.

Datsun 510

This bread-and-butter range that includes two- and four-door sedans and a four-door wagon are called '70 models mainly to indicate that they conform to present safety and emission control requirements as otherwise, there has been no change in either styling or engineering.

With the same 96-hp four as is now used in the pickup, the 510 has by far the best power-to-weight ratio in its price class and in addition, quite a cult of speed equipment makers now caters to this model. Standard transmission is a four-speed manual but for some reason, the optional automatic is offered only for four-door models. Suspension is fully independent and non-assisted front disc brakes are standard, as are flow-through ventilation and whitewall tires.

The wagon is roomier than most in its class, offering six feet of cargo space when the rear seat is folded. The single-piece tailgate hinged at the roof, though, makes the car impractical for hauling protruding objects like surfboards. A minor but noteworthy Datsun feature is a provision for locking the radio aerial in the full down position.

1600 and 2000 Sports

This two-year-old but still attractive design continues to more than hold its own in SCCA competition, particularly in 1982-cc form. Five main bearings, an overhead cam and twin SU-type Hitachis combine to produce 135 horsepower and a 118-mph top speed. The 1600 (1595 cc) loses only 15 mph with 39 less horsepower but is much less expensive to buy.

Coincidentally this latter engine has the same displacement and horsepower as the 510's but it is a different unit with a 3.433 x 2.630 bore and stroke, compared to 3.30 and 2.90 in the family models. It has a 9 to 1 instead of an 8.5 compression ratio and peaks at 6000 rpm instead of 5600, explaining why the valves tend to get a little noisy in service. The 1600 gives you a four-speed box, the 2000 a five, but both are fully instrumented. Radial tires should be but aren't standard.

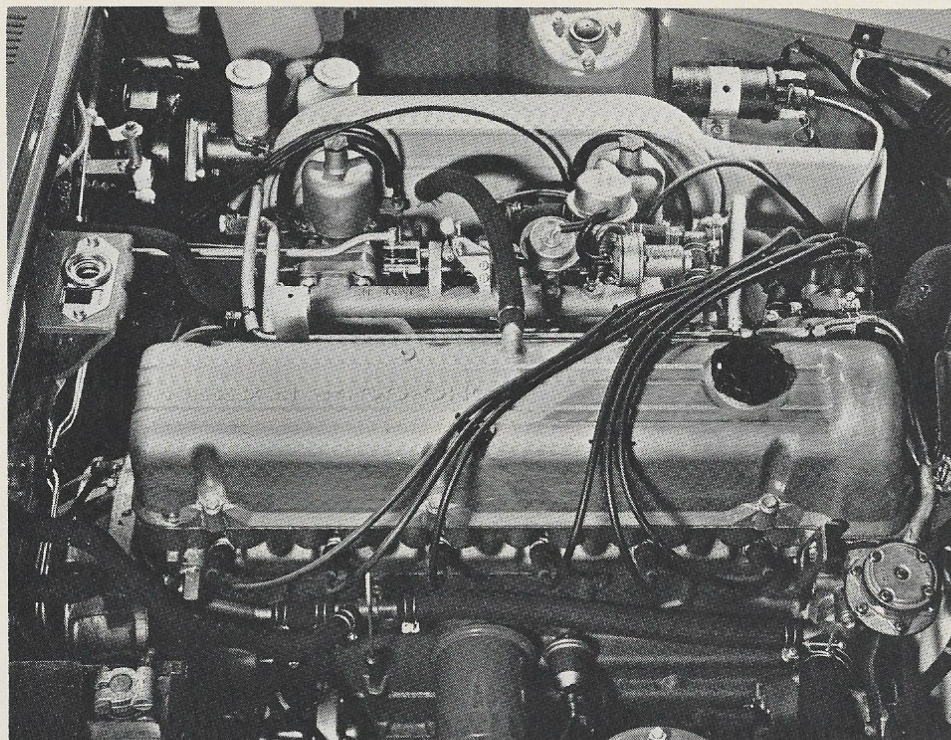
Don MacDonald



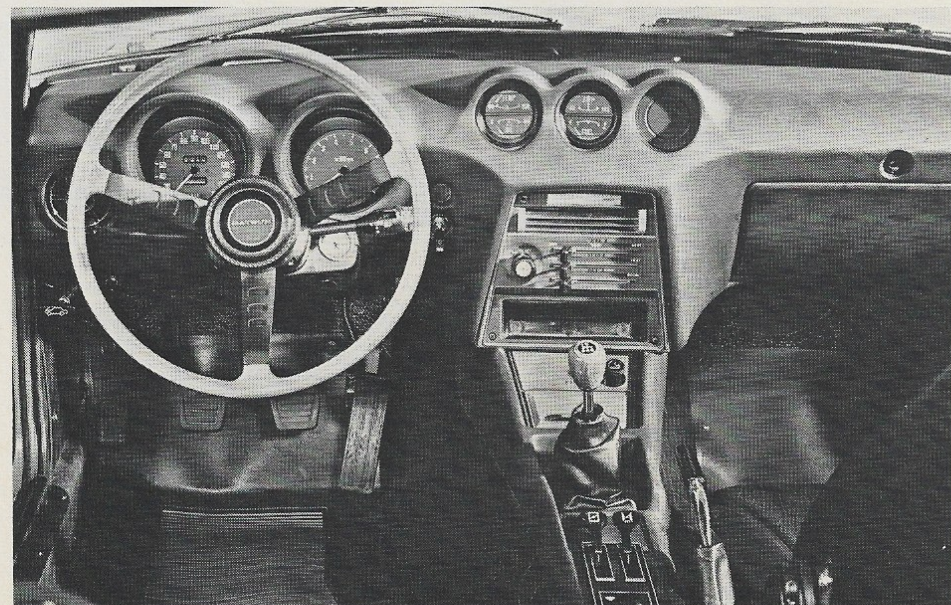
Rubber imbedded bumper wraparounds are a neat touch as is the lockable antenna for the standard radio. Tailgate glass has an imbedded heater.



The 1600 (shown) and 2000 roadsters are outwardly identical except for grilles. The car wears its top a little less like an ill-fitting hat than most.



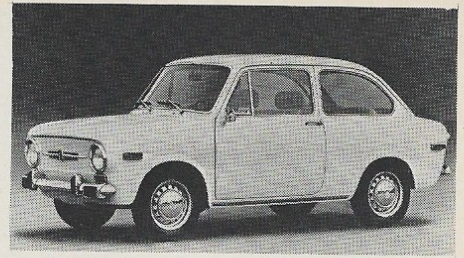
240Z engine is Datsun's first six in this market. Rated at 150 horsepower, it displaces 2393 cc (146 cu. ins.) and is fed by twin SU's from a 16-gal. tank.



Prototype cockpit lacks the standard clock and radio but shows wood-rimmed wheel, desirable pistol-type handbrake and a footrest for the driver.



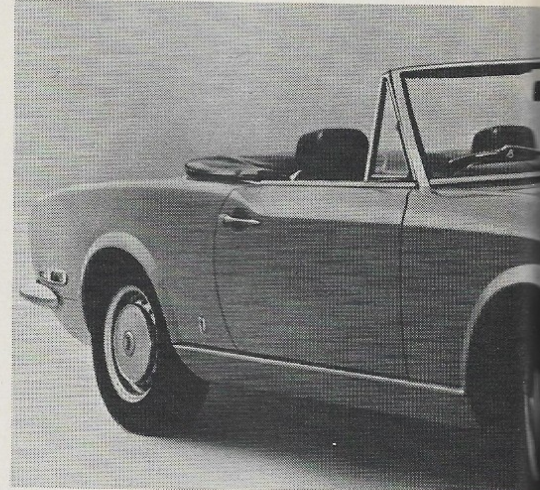
FIAT...Starring the 850 SPORT RACER



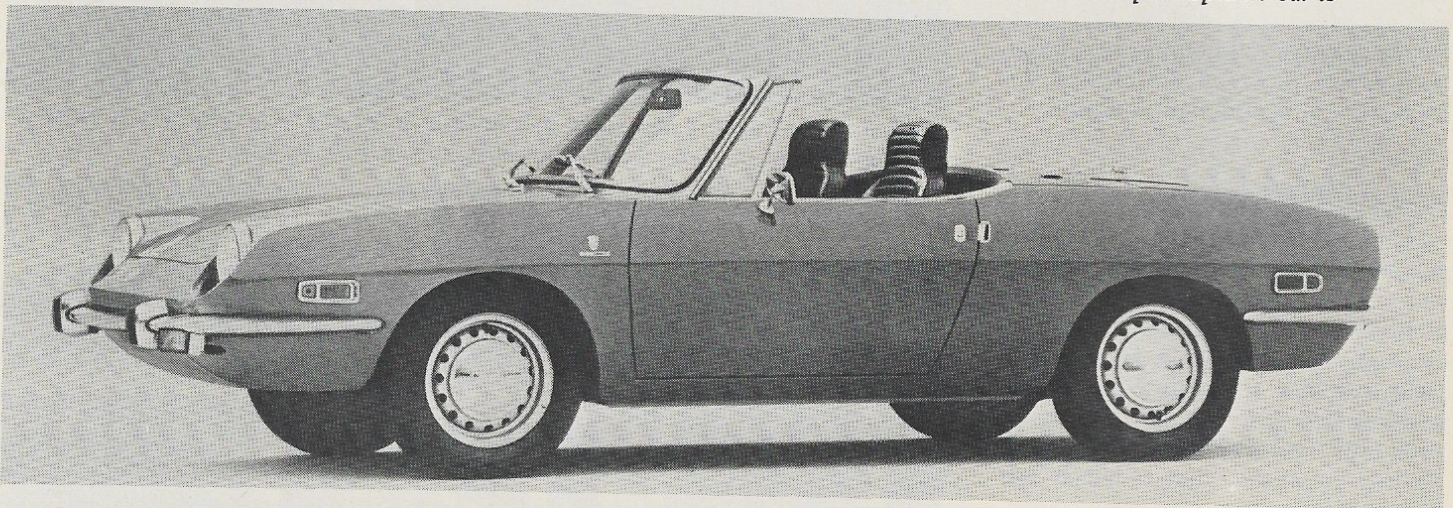
The \$1500 two-door 850 is strangely enough a slow seller in the U.S., perhaps because it revives memories of the troublesome mini-Fiats of the late fifties.



Though not shown, a chrome roof rack is standard on the 124 wagon. The 76-hp engine is front-mounted and there's servo-assisted disc braking at four wheels.



Dino-inspired grille is one of many changes made for '70 by Pininfarina in the 124 Sport Spider. Car is



Sport Spider is continued without much change other than more power and like all Fiats, standard radial tires. A detachable hardtop is optional.

Best Fiat bargain at \$1988 is the Sport Coupe. It's factory styled but it has the larger 58-hp engine, full instrumentation and front disc brakes.



The 124 sedan is another slow seller for Fiat here although it offers more doors, power and room than a Type III Volks selling for many more dollars.



Sleek 850 Sport Racer is Bertone's latest contribution to Fiat's U.S. offerings. Vents in roof are part of the flow-through ventilations system.



unique in its class with dual cams and five-speed box.

Fiat 850

It's only when you view the full line of Fiats sold in the U.S. that a unique feature of the make becomes apparent. Of the eight body styles in two series only the Sport Racer and Sport Spider in the 850 grouping have interchangeable front and rear sheetmetal. All the rest are distinctively different from each other, even to headlight arrangements, grills and taillights.

You'd think that would be the expensive way to build cars but no, the little seen Fiat 850 two-door sedan goes for \$1504 cash at the Port of New York. This one has drum brakes and a 42-hp, 50-CID four-cylinder engine. Despite the fact that this is less displacement and horsepower than one cylinder of a Cadillac Eldorado, top speed is somewhat over 70 mph.

The two-door is as austere as the other 850's are plush. Except for speed and fuel, instrumentation is by warning lights and the floor mats look sort of like those that hotels provide to prevent accidents in the shower. On the other hand, the two-door shares with its Bertone-styled sisters such niceties as courtesy lights, a light in the luggage

compartment, undercoating, rubber inset bumper guards and a tool kit. Also, it is the only model offered with Idromatic clutchless transmission of the same Ferodo design used by Volkswagen and Simca. The shift points of this are rather nicely spaced, but it's vital for new owners to remember that shifting originates with the lever, not the accelerator pedal.

For this writer's money, Fiat's best bargain is the 850 Sport Coupe because for \$1988 you get all the power, wood-trimmed instrumentation, carpeting and disc brakes of the Bertone jobs without having to pay at least \$180 extra (increment to the open Spider) for his label on fenders. All prices mentioned, incidentally, reflect the 2% hike for 1970 which on the models under \$2000 at least is more than made up for by the new provision of Pirelli radials as standard equipment. Horsepower on all Sport models has been boosted to 58 and they really should be called 903's rather than 850's because that is the new displacement. Claimed top speed is over 90 mph.

The Sport Spider is continued without change except for the increase in power. Sam Kaplan, Fiat's press agent, writes that "driving it is like getting a trumpet's blare from a piccolo" and to be sure, it's diminutive enough to make a full sized human seated in it look as if he were driving his cigar. But set off by itself, as in our photograph, its proportions are indeed exquisite. Like all the 850's, the engine is in the rear and the four-speed manual box has a shorter throw than most. A detachable hardtop is available as an extra.

The latter would seem to make the all-new Sport Racer at \$2471 redundant to the range but no detachable top could match the sleek lines of this little gem. Scaled up a bit, the body with standard factory trim would be fully at home on a Ferrari or Maserati chassis. Vinyl covering for the top in black or white ensures a two-tone scheme for each car (they look larger this way) and there's an excellent flow-through ventilation system provided. Rather than wood as in the other 850 Sports, the complete instrumentation is set in vinyl basketweave that matches the seats.

Once you shoehorn your way into an 850 Sports Racer you'll find reasonable headroom and more than adequate legroom. Some rather thoughtful items of factory equipment include intermittent wipers and washers, a dimming rheostat for instrument lighting, sway bars fore and aft and of course, the radial tires.

Fiat 124

Fiat-Roosevelt Motors, the U.S. distributor, has recently been bought by the Italian company but that won't change policies nor one particular obsession; namely, that the 124 Special sedan should sell better on these shores than it does. To this end, they've restyled the front end, added three more horsepower (for a total of 76) to the front-mounted ohv 1438-cc four, recessed the door handles and gave it radial tires.

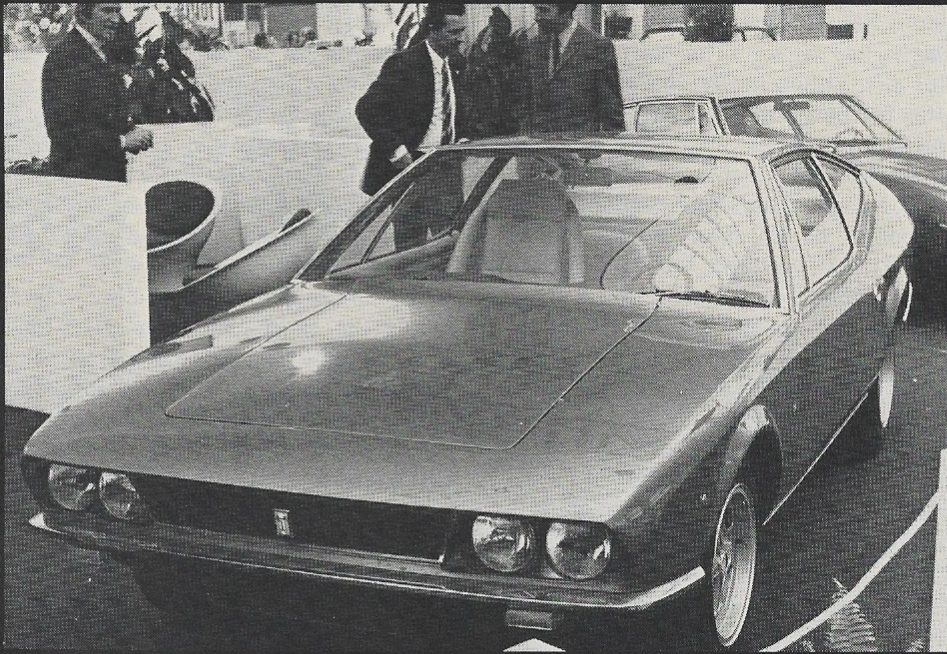
The more popular four-door wagon shares the same engine and 94.3-inch wheelbase but has its own front end styling with single headlights. All 124's have power-assisted, four-wheel-disc braking and coil suspension fore and aft. It's not shown in the picture but the wagon has a standard chrome roof rack. The sedan price is \$2015 at New York and the wagon, \$2273, which puts them uncomfortably close to the much more powerful Toyota Coronas and Datsun 510's.

The attractive 1969 version of the 124 Sport Coupe will be carried at \$2999 until January 1st when a new version is due. This has the same 96-horsepower dohc version of the 1438-cc four as the Sport Spider at \$3304, the healthy differential being due to the latter's five-speed transmission. The others have fully synchronized four-speed boxes. Pininfarina's restyling of the Spider should give you an indication of what's in store for the forthcoming Coupe. The two-passenger models are mounted on a 89.5-inch wheelbase but weigh approximately the same 2100 lbs. as the wagon.

Coupes and Spiders are fully instrumented including a tach and clock whereas the sedan and wagon rely mostly on warning lights. Claimed top speed for the family cars is 93 mph, which climbs to 106 in the sports models.

Barring dock strikes and continued Italian labor troubles, Fiat's U.S. goal is 55,000 units for 1970 which they claim is based more on the allocation than the capabilities of the 600 dealer outlets. Those of you who live or travel by Fiat in the prairie states where the make is rather sparsely represented will be glad to know that a push is on for dealers there. Meanwhile "Buy American" addicts might be interested to learn that Fiat spent \$40 million in 1968 for U.S. goods and machinery, an amount equal to about half the retail value of Fiat cars sold here. Contribution to the national product by the 600 dealers more than makes up the difference. — Don MacDonald

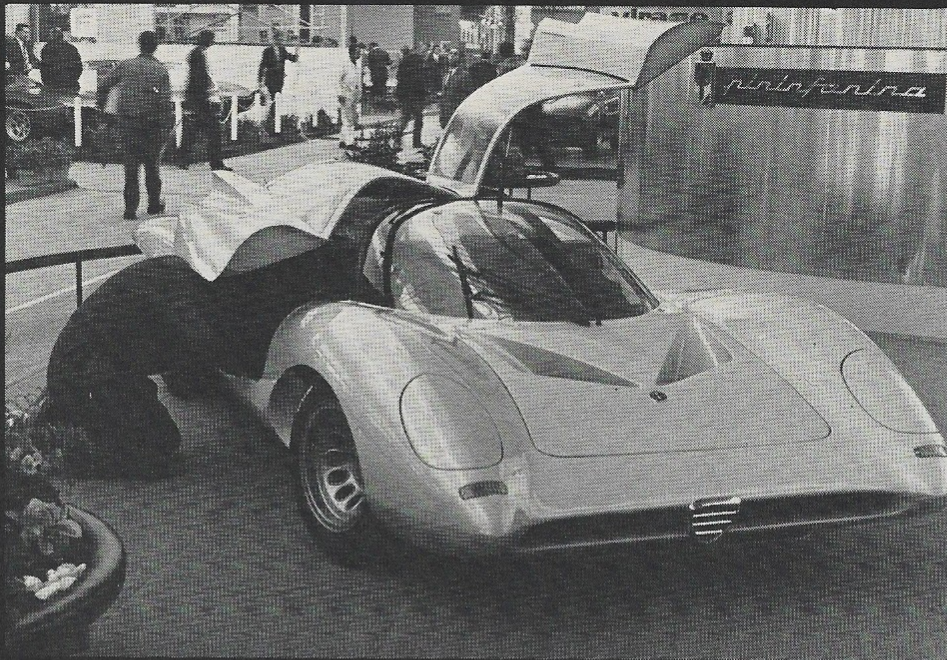
THE BEST FROM THE LONDON



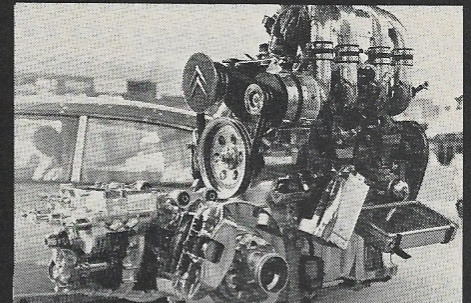
The Mustela, newest from de Tomaso, puts a 268-hp ohc injected V-6 derived from British Ford up front to make room for four people inside.



The Belgian Mean (pronounced mee-ann) is a \$750 fiberglass kit in coupe (right) and roadster form that takes VW, Porsche, Simca, BLMC etc. running gear.



Pininfarina's Alfa 33 coupe was a cleaned-up version of last year's gullwing with Dino internals. Technician is unwittingly demonstrating why it won't sell.



Citroën's new injection system will push a DS to 115 mph at 6000 rpm. "Black box," chromed and given a glass cover for show sits on the right.

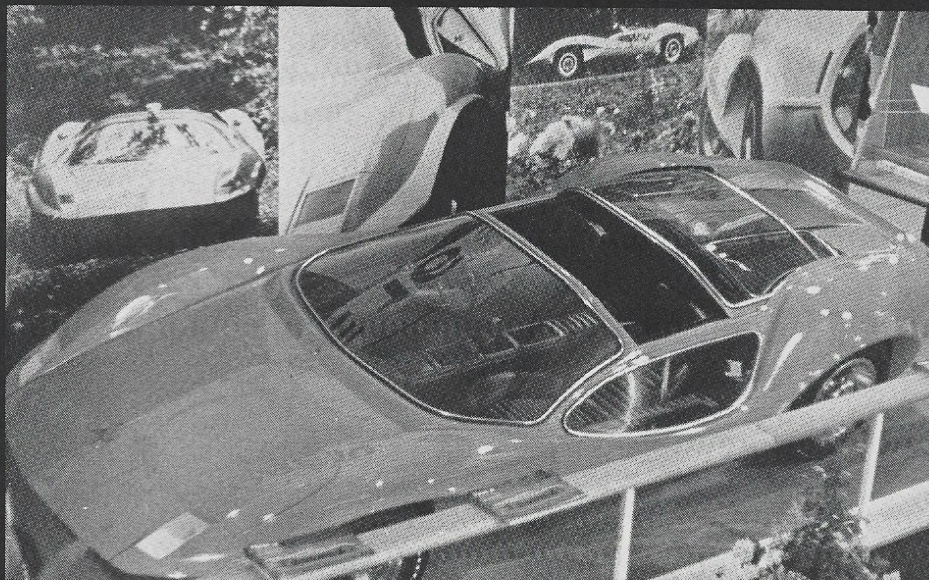


Simca customized by Pierre Cardin featured various dash projections, and Edsel-like clock in the wheel hub and over-stuffed seats upholstered in glove leather that no one was encouraged to try.

PARIS SHOW

AND PARIS SHOWS

Photos by Sloniger



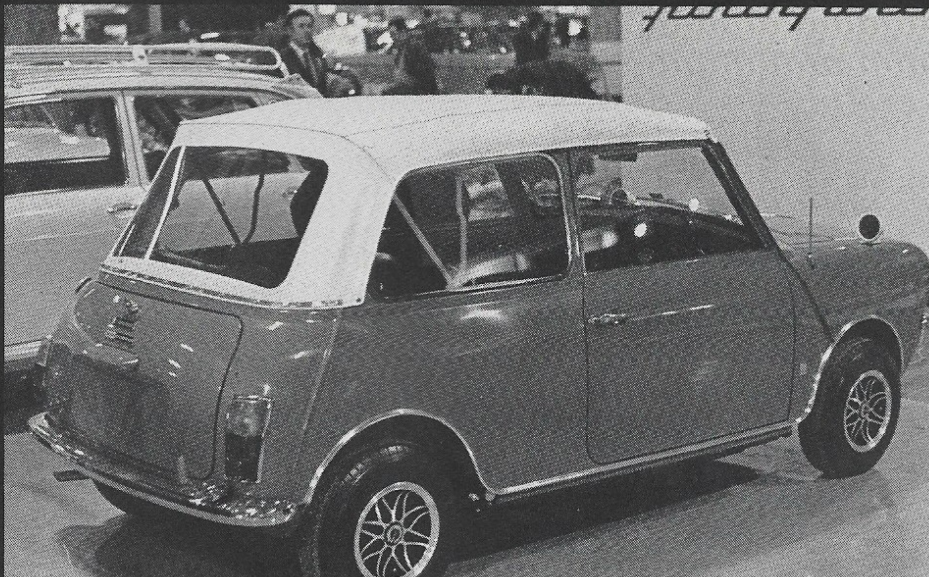
Commissioned by the British Carriage and Automobile Manufacturers Assoc., Probe 16 by the Adams Brothers was meant as an exercise to show "what British designers can do."



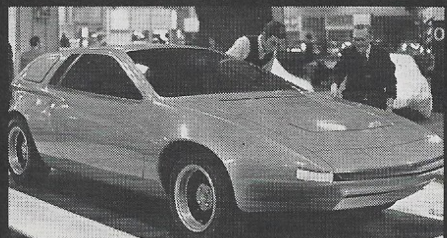
Financially troubled Trident (nee TVR), a specialist builder, pins its hopes on Venturer with Ford V-6 power and underpinnings. Like the V-8, which continues, it is a Fiore design.



The Clubman Estate, sold in both Austin and Morris form, sports new woody-grain panels on its sides and back. From the front, some have unkindly compared it to a Honda.



One bright aspect of the otherwise morbid British mergers and resulting badge engineering is the rise of firms like Crayford who will convert(ible) almost anything for a modest price.



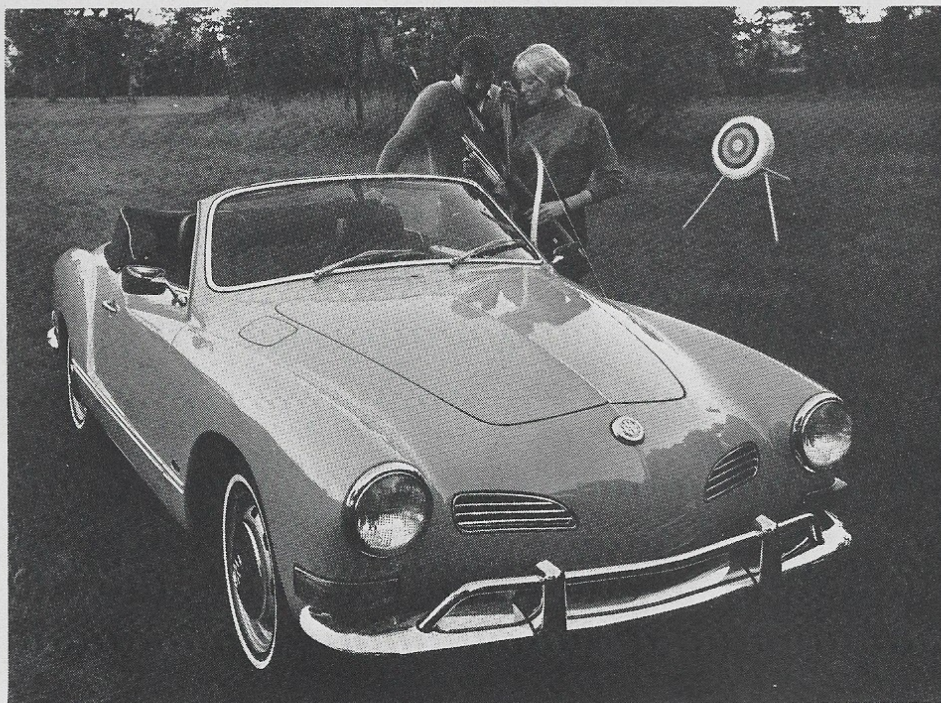
The Zanda by the Austin/Morris studios may presage work going on there with a mid-engined 1.5-liter GT. They admit, though, that it never saw a wind tunnel and may be all wrong aerodynamically.

LONDON SHOW



KARMANN GHIA

Now 1600 cc's, the coupe and convertible are continued with few appearance changes.



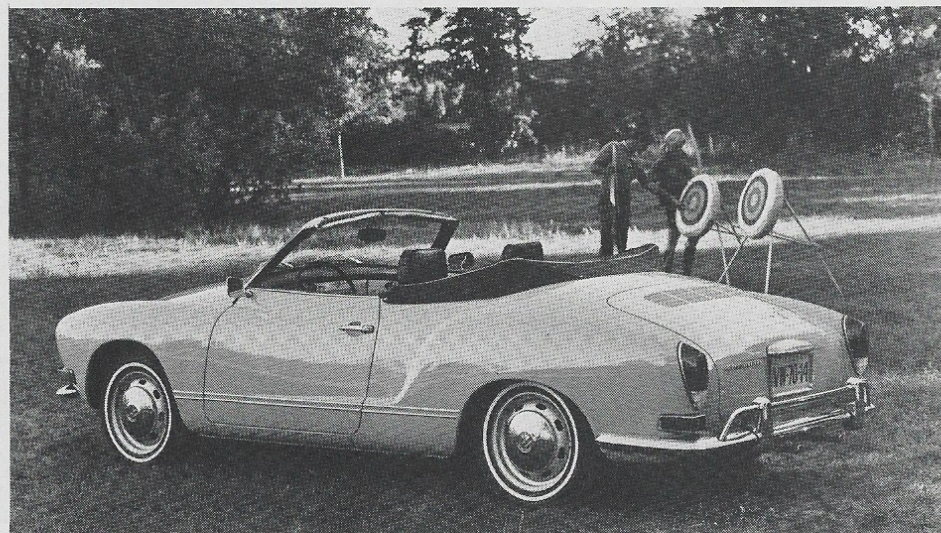
Only Karmann Ghia styling change in front is wrap-around parking lights. Car remains on 94.5-inch wheelbase and measures 163-inches overall, 4.3 inches longer than the beetle.

Volkswagen's Karmann Ghia coupe, the two-seater sometimes described as "the good-looking VW," sports a bit more power and a bit more speed for 1970 than any of its previous look-alikes.

This year's improved performance comes from an increase in engine size and output to 1600 cc and 57 horsepower from 1969's 1500 powerplant and 53 hp. Result is more rapid acceleration for passing and a top speed of 84 miles an hour.

Among the few exterior changes are wrap-around turn signals up front which fill the joint role of parking lights, emergency lights, side markers and reflectors. New tail lights combine emergency, stop, turn signal, side marker and back-up lights. All this "unitizing" helps improve the looks of the car, already the world's most popular coupe with over a third of a million sold since the first rolled out of Karmann's custom body-shop back in 1955.

In addition you'll find an anti-theft buzzer keyed to the ignition system, an electric defogger and defroster for the coupe's rear window and slightly restyled rear fenders to match the new tail-light housings. One of the most important improvements for 1970 becomes apparent, however, only once every 6,000 miles. That's when the cars are scheduled to return to dealerships for VW's new diagnosis and maintenance program which quickly puts an engine through an electronic examina-



Rear fenders have been slightly reshaped to accommodate wrap-around turn signals. Power has been upped to 57 hp at 4400 rpm but the 1600-cc engine remains carbureted.

tion and tests other vital parts of the car, covering up to 96 different steps in all.

Built in both hard-top and convertible models, the Karmann Ghia is available with VW's optional three-speed Automatic Stick Shift transmission. Eliminating the clutch pedal, this transmission puts an end to gear-changing in traffic yet allows shifting for those who

want to run through the gears manually for top performance.

Designed as a two-seater, the Karmann Ghia also has a rear bench seat for occasional use. When not used for passengers, its back rest folds forward to expose a large luggage compartment. The car also has a sizeable luggage compartment up front.



1970 wagon may be identified by reflectors added to each corner. Except for minor carburetion modifications, the 1600-cc engine with 57 hp remains the same.

VW Type II Wagons, Campers and Trucks

Volkswagen's Type II station wagons and trucks have been outfitted with a number of structural as well as convenience improvements which help make them both more rugged and more comfortable than in the past.

For example, the passenger compartment was made stronger by reinforcing the front-end frame and VW engineers also developed a new safety steering column which will tilt away from the driver in the event of a front-end collision.

In addition, the front axle assembly was improved to help dampen road shock and smooth out the ride. This was accomplished by modifying the front axle torsion bars and redesigning the shock absorbers.

The exterior styling introduced for all models in the line two years ago remains unchanged this year. However, four tell-tale additions on the outside of each 1970 vehicle set it apart — but only for the VW expert. These are rectangular side-marker reflectors mounted near the front and rear ends to provide better night-time visibility.

Visible improvements inside the vehicles include a new gear shift lever, its

Real ride improvement, beefed-up front structure and a longer gear-shift handle are the important changes.

1-3/4 inches of added length making it easier to change gears in the fully-synchronized transmission. Also new on the inside is nylon velour carpeting for the station wagon's 33-cubic-foot rear-end luggage compartment.

Other improvements added for 1970 include a day-night rear-view mirror and a buzzer which sounds a warning if the driver begins to leave his vehicle without removing the ignition key. This, coupled with the steering column lock which was introduced last year, gives the vehicles a high anti-theft factor.

Measuring only 174-inches overall, considerably less than most conventional sedans on the road today, both VW's station wagon models and panel truck pack 177 cubic feet of passenger and cargo space inside. Station wagons are available with sliding steel sunroofs.

Both the panel and single-cab pickup trucks are rated for 2,370-pound payloads while the double-cab pickup which carries six passengers is rated for a 2,259-pound load. Both pickup mod-



Factory-built camper with optional pop-up roof sleeps two adults and three children, will cruise at 65 mph. Another factory option is a free-standing tent.

els can be equipped with bows and tarpaulins to convert their open cargo beds with their three "tailgates" (one along each side as well as a conventional one at the rear) into a sort of modern-day covered wagon.

The carbureted 1600-cc engine, rated at 57 hp, remained the same except for minor emission-control modifications. Claimed cruising speed is 65 mph on regular gasoline for all types including the relatively heavy camper version. ●

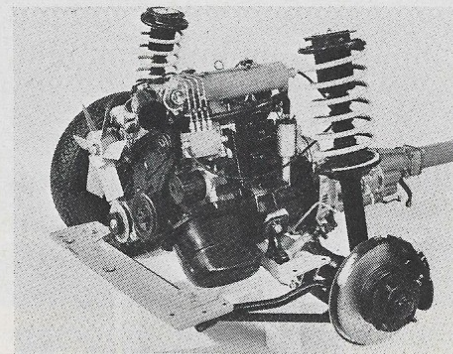


PEUGEOT 504... New to the U.S.

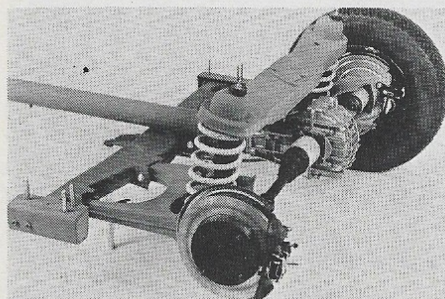


Visible in this view are Peugeot's ingenious new notch-back seats which hide the headrests when they're not wanted. The sliding sunroof, along with Michelin radials, is standard equipment.

The Golden Lion can prance with pride on the grille of this 97-mph sedan.



Although this engine has the Kugelfischer injection system not yet available in the U.S., the layout is otherwise the same as the carbureted version. The engine inclines 45 degrees.



Peugeot continues its traditional finned aluminum differential housing, a goodie offered only by Oldsmobile in the U.S. for about \$100 extra. Shocks are two-way to Peugeot patents.

The long-awaited Peugeot 504, Europe's 1969 "Car of the Year," finally appeared in U.S. showrooms last month. Unfortunately, it's the carbureted 87-hp version and no mention is made as to when, if ever, the 103-hp injected model will be available.

Even so \$3195 (East and Gulf Coast P.O.E.) brings you a lot of standard goodies including the traditional sliding sunroof. There are Michelin radials, power assisted 4-wheel disc brakes and true 4-wheel independent suspension. Then Peugeot are one of the few makers nowadays to offer the desirable rack and pinion steering.

When we first saw SAAB's ingenious pretzel-like see-through headrests, we thought them to be the ultimate solu-

tion to a device that causes more problems than it solves but now those kudos must be withdrawn. Peugeot's better way is to recess the rests in the seat backs from which they pop up if wanted. This method also allows the fully reclining seats to fully recline.

Standard transmission is a fully synchromesh 4-speed manual box but

around January, \$200 extra will get you a 3-speed ZF automatic. That, plus factory air and a variety of radios comprise the option list.

The monocoque body is mounted on a 108-inch wheelbase and measures 177-inches overall. Both the fuel tank and the luggage compartment are generous, coincidentally measuring 14.8 each in gallons and useful cubic feet, respectively. At the claimed cruising consumption of 24.3 mpg, this gives a range of about 360 miles. Now, if Peugeot along with the other imports would only design their crankcases to hold either four or five quarts of oil, and not 4-1/4, business dealings with the corner service station would be entirely satisfactory.

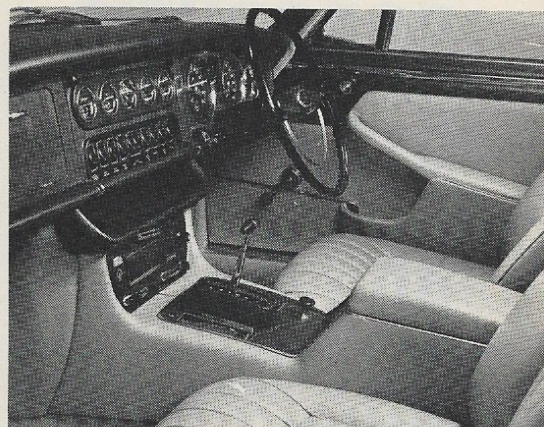


With standard air-conditioning the Daimler cum Jaguar at last has adequate intakes. Like the XJ6 from which the Sovereign stems zero to 60 should come in 8.7 secs with a top of 127 mph.

One Man's Jaguar Is Another's Daimler



Integral body/frame construction is on a suspension tuned for Dunlop's new radials with a unique "anti-aquaplaning" tread. Car meets U.S. emission and safety requirements but won't be officially imported.



Instrumentation and controls are identical to the XJ6 but the upholstery is of a richer leather. An automatic and all power assists are standard.

Owning a Jaguar may be a snob thing in America but to some folk in little old England, Jaguar continues to be a slightly dirty word. The idea still lingers that it's a cheap imitation Bentley for the newly-rich, and that the man who has trampled on business rivals to make money fast drives a car in the same aggressive way. So if you drive a Jaguar sedan in Britain, some car and truck drivers will act aggressively before you do. They'll be thoroughly obstructive in traffic either for revenge on the last Jaguar man who cut them up, or to stop you from doing the same.

Drive a Daimler sedan or limousine, though, and a red carpet rolls out in front of you. That fluted radiator which goes back more than 60 years still means cars for Kings and for gentlemen. When you want to change lanes, a gap is smilingly made for you by a driver who knows that any Daimler driver has good manners and would condescend to do the same for him if the occasion arose.

All of which seems downright crazy when you know that Jaguar bought the Daimler plant back in 1960 and today build the Daimler cars in the Jaguar plant. But, it's still true that a profitable number of folk who wouldn't be seen dead in a Jaguar, will pay a rather higher price for a fluted-radiator Daimler.

Well, the last pre-Jaguar bit of Daimler engineering has now died. When Jaguar bought Daimler the fluted radiators were going onto rather poor cars with rather fine hemi-headed V-8 engines, so Jaguar produced a new model with the V-8 Daimler engine in a Jaguar

(Continued on Page 56)



PORSCHE'S 911's -- T, E and S

Increased horsepower and the demise of the 912 is the only identification.

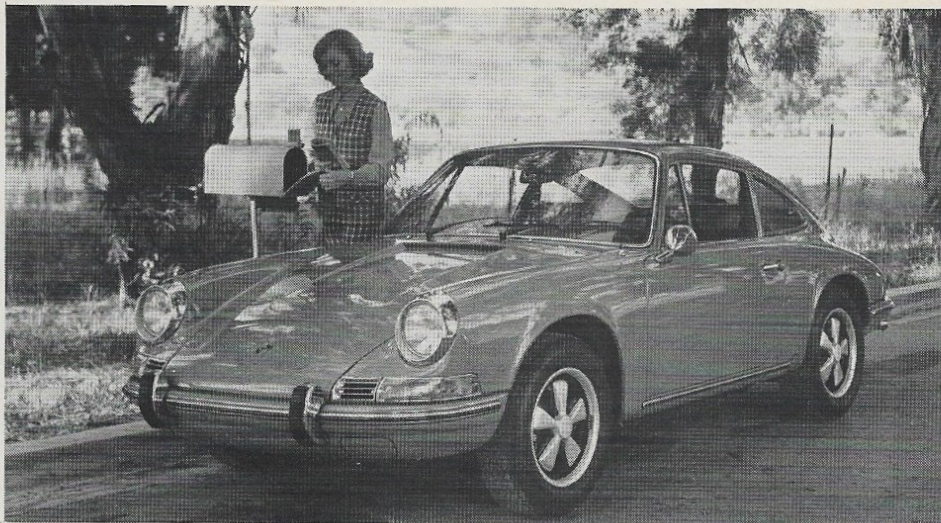
The 1970 Porsche 911 looks the way it did last year, but the new models have faster acceleration and higher top speeds thanks to a more powerful engine. The cars are now on sale at the approximately 150 Porsche Audi dealers.

The 911, one of the world's few remaining grand touring cars, has an engine increased from 2 to 2.2 liters displacement (121.5 to 133.8 cubic inches). The 912 has been dropped, being replaced by the mid-engined 914/4 and 914/6. In a sense, this is more than a replacement as the 914's price starts some \$1,000 below the 912.

We quote John E. Reilly, vice president of the Porsche Audi Division of Volkswagen of America, who says: "The 911 series has had gratifying popularity among Porsche enthusiasts for use on the highway or the race track. The bigger engine is designed to keep the 911 attractive to buyers of fast touring cars. The extra horsepower will provide quicker acceleration for safer passing and higher top speeds for competition on race tracks, yet the engine is tractable in low-speed, around-town driving. We've produced a car designed to appeal to the enthusiast — and his wife, especially with those Porsches equipped with Sportomatic, our clutch-free 4-speed transmission."

The 911 series is equipped with six-cylinder, overhead camshaft, air-cooled engines in three states of tune. The "T," which has two 3-barrel carburetors, has 142 horsepower at 5800 rpm. Next hottest is the "E" which has a fuel injection engine developing 175 horsepower at 6200 rpm. Fastest of all is the 911 "S" which also has fuel injection. Its engine develops 200 horsepower at 6500 rpm. In competition, the cars can

(Continued on Page 57)



Porsche is unchanged for '70 except for horsepower which ranges from a minimum of 142 to 200. In order, these choices are now called "T," "E" (for fuel injection), and "S." The latter also has injection.



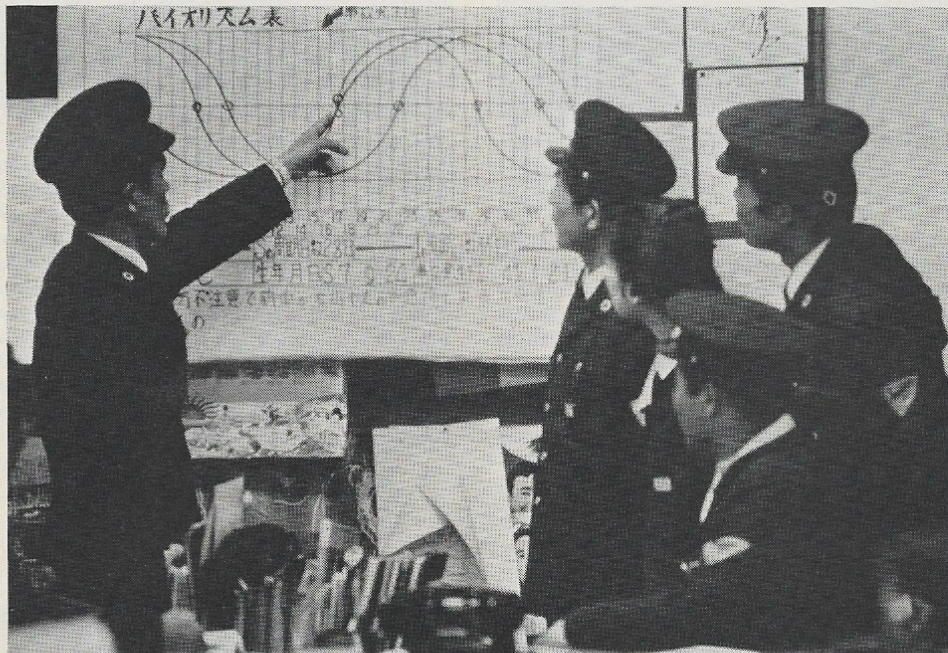
The "Targa" convertible is the optional body style with its built-in roll bar and stowable top. It's newly available with any of the engines.



This is the business end of any Porsche and its ratings as usual are imprinted on the engine deck. Though now VW controlled, the new owners make a point of noting that the Porsche family still has the say.

The Biorhythm Theory...

A New Way of Preventing Accidents



Before the start of each shift, Omi Railway Co. cab and bus drivers study the biorhythm chart posted in the dispatch office to determine where they stand in their cycle, and drive accordingly.

Do you believe in the theory of cycles, or biorhythm, as it's called? That boom and bust recur in the same sequence? A major Japanese transportation company does, and by applying the theory to its drivers, it claims to have drastically reduced their accident rate.

According to an estimate by Isuzu Motors Ltd., one of the leading car-makers of Japan, more than 16,000 persons — a record figure — would die from traffic accidents before the end of the year. In Japan, an average of 41 persons are being killed in traffic accidents every day.

The theory maintains that every man goes through certain cycles from the moment he was born till the time he dies. The cycles are said to control man's physical, sensual and intellectual activities.

Omi Railway Co., Ltd., which operates more than 700 buses and taxis, in addition to a private railway, in heavily-trafficked areas around Kyoto and Osaka in Western Japan, introduced the system for its drivers last year. As a

result, the rate of traffic accidents was decreased by one-third, according to Senzaburo Oka, former assistant chief of the company's Traffic Safety Section.

Biorhythm, which is the science of man's biological cycles, teaches that your feeling of physical fitness passes from low to high and back to low again in 23-day cycles. You go through a sensual cycle of 28 days and a cycle of intellectual activities in 33 days.

Oka explained that a man is at his best — physically, sensually and intellectually — during the first half of the cycle and then his condition declines in the latter half.

He said every man, whether he likes it or not, goes through the three cycles from the moment he was born to the time of his death. These cycles, expressed by initials P, S and I, are considered to determine his over-all biological condition.

The ups and downs may simply be calculated by dividing the number of days one has lived so far with the three figures.

One must particularly be careful at the beginning and in the middle of each cycle when his condition goes from up to down or down to up. "Statistics testify to the fact that many accidents happen at such times," Oka said.

Before starting the day's work, each employee of the company looks at his own biorhythm chart to study his biological condition. "It takes only a second to enforce the biorhythm theory," Oka said, adding, "but the result is enormous."

Ever since the successful application of the theory was announced, the company has been inundated with letters of inquiry from many domestic firms. Invitations came from different parts of the nation for guidance and lecture. Now the theory is practiced by not only railway and transportation companies, but also by a great variety of firms and, recently, by the local police of the Shiga Prefecture.

The biorhythm theory, developed in Europe about 60 years ago, was propagated in Japan by Dr. Yoshinosuke Tatai, who has attended several international conferences of the Society for Biological Rhythm.

It was feared at first that the biorhythm theory may give unwarranted anxiety to drivers as to the possibility of accidents on the days of danger, or that they may be excessively relieved from tension on the other days.

The point, though, of the theory lies in the distribution of the drivers' attention. Drivers should always be on the lookout for danger and are not allowed to neglect safe driving even for a second. Instead of being always on the alert, the drivers are asked to be "especially careful" in driving on the days of danger.

The company claims amazing results from the biorhythm theory, which it has applied to 500 drivers at their 13 branches since last August along with other safety programs. During the first seven months last year, the company's drivers caused a total of 46 accidents, but only 35 accidents were reported during the corresponding period this year, according to Oka.

Analyzing the accidents caused by the drivers during the January, 1964 — December, 1968 period, it was revealed that 59 per cent of them happened on the days of danger, or on days immediately before or after.

Oka said if the motorists in the world would make it a rule to look at the biorhythm chart and be careful about driving on the days of danger, it would greatly help to decrease the accidents. ●

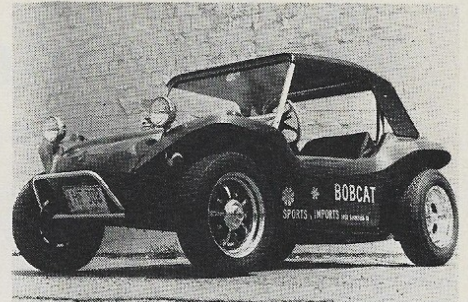
VW SPECIALS... THE LATEST—FROM BUGGIES TO LIMOUSINES



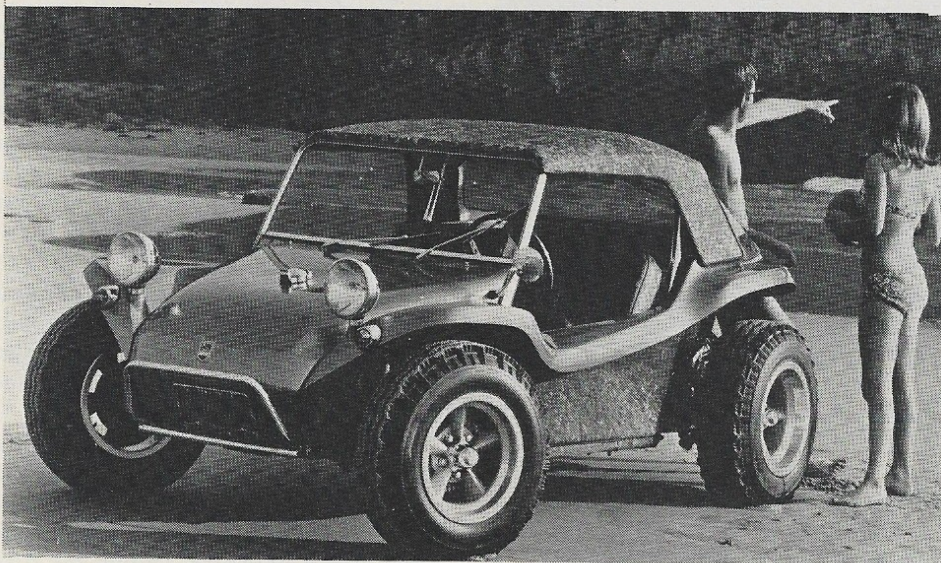
Though a completely equipped '70 EMPI Imp like this would cost you \$3000 or more ready to run, you can start your own old VW engine, running gear and platform plus EMPI's basic IDB-200 body kit for \$395. Changes for the coming year include integrally molded rear seats, the optional, removable side and rear panels, a new and more complete dash panel and provision for a Pontiac-like scoop on the hood to house a tachometer. With the optional rear panel, fenders and engine coverage meet the more stringent licensing requirements now being enforced by some states. Address queries to Engineered Motor Products, Box 1120, Riverside, Calif. 92502 to the attention of Chuck Tatum, general sales manager.



Dearborn Automobile Co.'s latest buggy kit is the Deserter G.S. for \$1300 complete except for engine, VW transaxle and front end. The G.S. was designed for Corvair power but either VW or Porsche four- and six-cylinder engines may be used with no major modifications. A Porsche-powered Deserter raced by the factory last summer in SCCA competition beat all Corvettes and Cobras every time out. Acceleration with the turbocharged Corvair 180-hp engine is zero to 60 mph in 4.7 seconds, making it one of the hottest sports-racing cars ever offered in street legal configuration. A catalog is available for the asking from Ron Meade, general merchandising manager, Dearborn Automobile Co., 2 Barnard St., Marblehead, Mass. 01945.



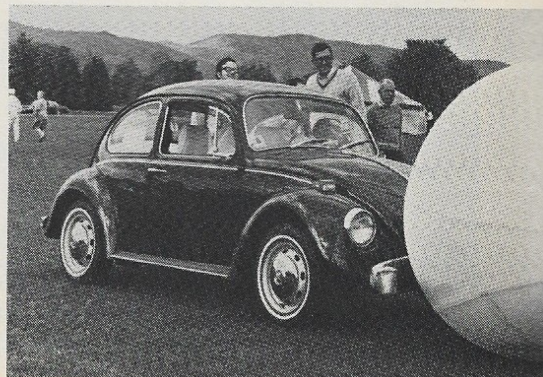
One of the newest additions to the burgeoning buggy field is Poly Pad's Bobcat. The basic body kit for \$395 (quite a few makers seem to be settling down on that convenient figure) weighs only 145 lbs. and is available in five flat or 39 metalflake colors. The Bobcat is pictured here with the optional hardtop which comes in either black or white vinylgrain finish. They'll send you a 6-page brochure if you write Poly Pad Imports, 5000 Brookpark Rd., Cleveland, Ohio 44134. This contains everything you'll need to produce the streetable car pictured.

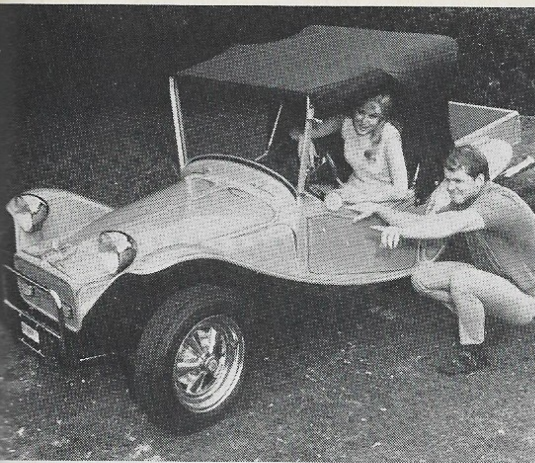


The Meyers Manx is the granddaddy of all kit dune buggies which in its latest form, is called the Manx 2. With it comes a rather dramatic price breakthrough, with \$289 being the figure quoted for the basic body kit. It should be emphasized, though, that that is only the beginning as is true with all the other kit builders. The redesign for '70 includes the hood, dash panel and windshield attachment area in the interests of material and labor savings and hence, the lower price. The B.F. Meyers & Company can give you further information if you write them at Box 8266W, Fountain Valley, Calif. 92708, or perhaps the VW dealer in your neighborhood handles Meyers' kits. Many of them do.

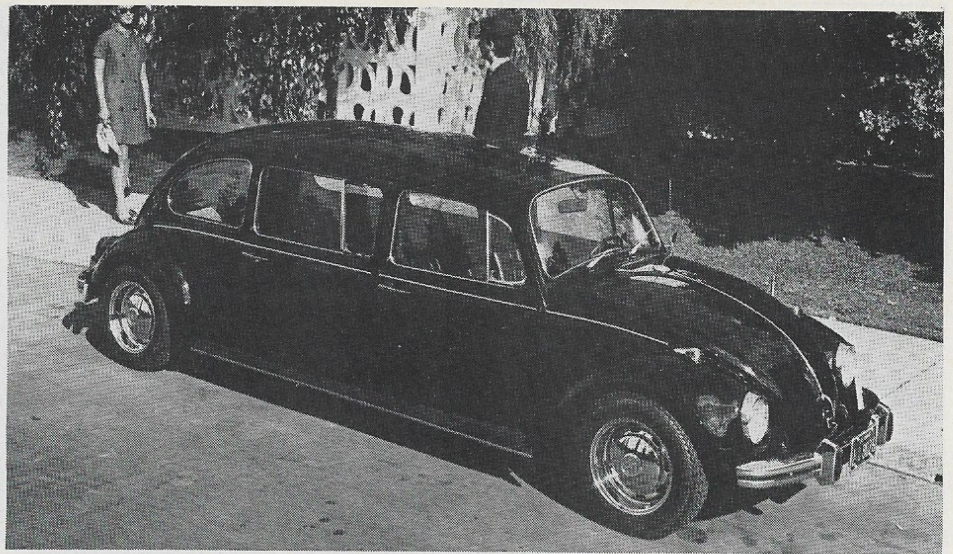


The Super T is just one of five different buggy styles offered by Kellison. This one's designed to fit a VW chassis shortened by 15 inches and the styling is obviously a take-off on the long-hooded MG TC, the car that started the sports car movement in the U.S. Kellison also makes the GT-40K and Shark, both wild sports coupe bodies designed for the VW chassis. Send your queries to Sally Kellison, Dept. WCG, Highway 99E, Lincoln, Calif. 95648.

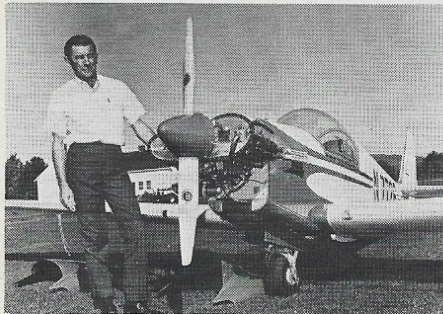




Berry's Mini-T is a popular kit for buyers who like to combine a bit of nostalgia with modern VW power and suspension components. Or, like most of the other kitmakers, Berry will sell you a complete car just as fancy and as powerful as your pocketbook will stand. Unlike the others, Berry lets you select your own custom shade of paint in addition to his standard nine metalflake and three solid colors. They suggest you see your local dealer or send \$1 for a fully illustrated Mini-T brochure to Berry Mini-T Corp., Dept. WCG, 1123 Nevada St., Long Beach, Calif. 90806.



Practical and surprisingly goodlooking is this \$35,000 custom beetle limousine built by Troutman-Barnes of Culver City, Calif. for auto show display. It features all the traditional appointments of the world's finest limousines including a glass divider and intercom for passenger privacy, a bar, jump seats, a 5-speaker cassette stereo system, power windows, and tufted broadcloth upholstery with black leather trim. It's 16.5-feet long, has a 131-inch wheelbase and weighs only 2400 lbs. which is just 400 more than a standard beetle. Power comes from a 1600 engine equipped with dual Weber carburetors.



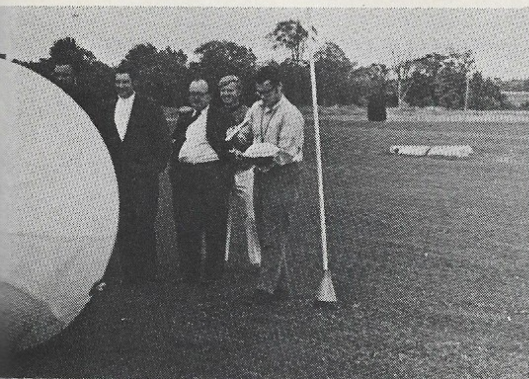
The VW-powered Fournier RF-4D glider is imported by Sport-Aviation, Inc., of 401 Holmes Blvd., Wooster, Ohio 44691. Pictured with it is the Czech aviator and freedom fighter, Mira Slovak, who piloted a similar VW-powered plane non-stop from Germany to California only to crash a heart-breaking few minutes and miles short of his destination. Fully recovered and now a pilot with Continental Airlines, Slovak is still enchanted with the versatile little single-seater which has an acrobatic capability second to none.



The Bensen Gyrocopter, developed by Bensen Aircraft Corp., Box 2746, Raleigh, N.C. 27602 uses VW power in what may well (with a little more protection from the elements) be the commuting vehicle of the future. The frail-looking craft actually is almost foolproof in its operation and could be landed at any VW dealership to take advantage of the new diagnostic inspection centers.



This "All-Terrain" Wagen with VW power is now being produced by Busse Bros., Inc., of Randolph, Wisc. 5396. We went riding in it recently and it scoffs at inclines such as shown in the picture. It also swims at 3 knots or so per hour, enough speed at least to get you out to the duck blind. Drive is through all six wheels which can produce some hairy moments for inexperienced drivers while you dangle at the edge of an embankment on the center set. It will turn in its own track via hydraulic disc brake steering and you can have either an automatic or 4-speed VW transmission for the chain drive. It will run 10 hours on 10 gallons of gas. Price starts at \$4875 for the basic vehicle.



And finally we see the world's most powerful soccer player. For fun at your club's next gymkhana, remove the front bumper of a Volks, install the curved replacement section shown, buy an old weather balloon (filling it with air, not helium) and you've got a fun-filled event to see who can guide the balloon between the pylons in the shortest time.





GRAND PRIX OF THE UNITED STATES

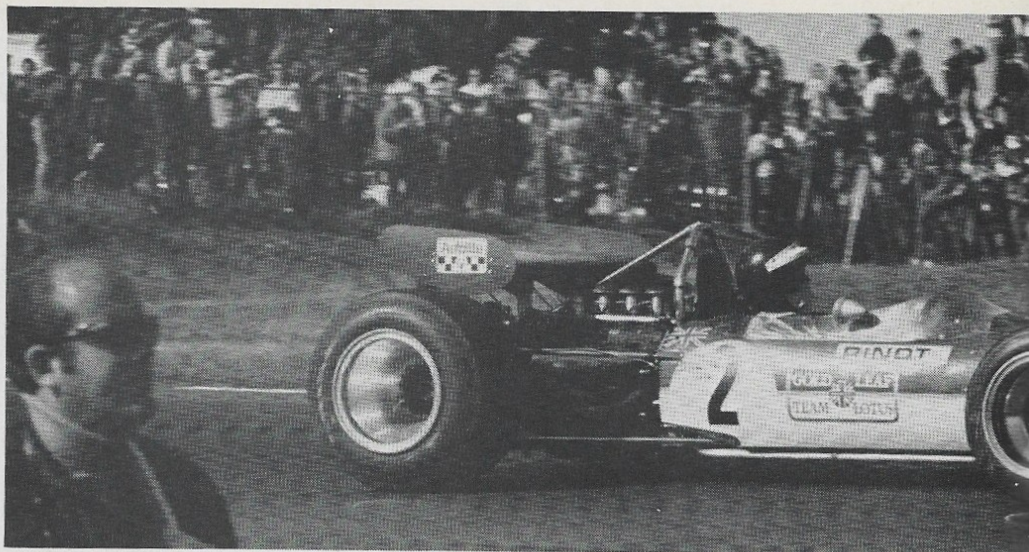
Watkins Glen, richest Grand Prix of them all, was of no help in World Champion Jackie Stewart's quest for seven wins this season.

It was a sweet victory in the Grand Prix of the United States for Austrian Jochen Rindt and the Gold Leaf Team Lotus, but owner/builder Colin Chapman had to have mixed emotions as he smiled/frowned his way through the presentation ceremonies with Rindt, Miss U.S. Grand Prix and Master of Ceremonies Dick Smothers.

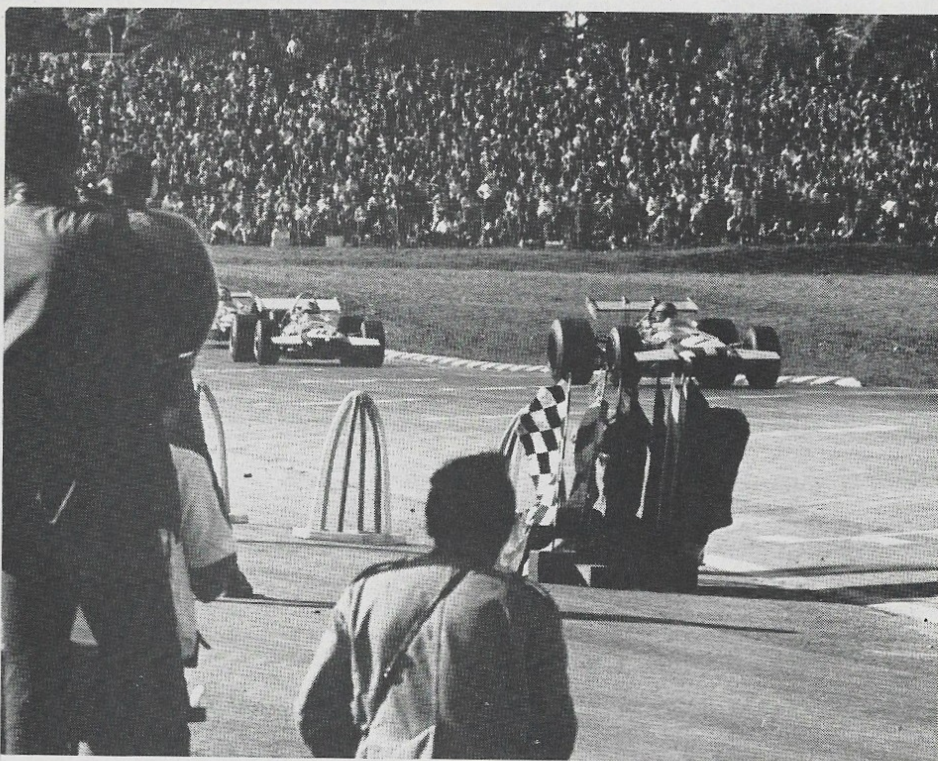
On average it had been a troubled afternoon for Chapman, who was glad to see Rindt grab his first grand prix win in five years of trying and the \$50,000 first money that went with it. However, he kept asking assistants for the latest from the Elmira, New York hospital where last year's World Champion driver and Team Lotus No. 1 Graham Hill lay with his right leg broken in three places and his left knee dislocated.

Besides, Chapman had to ponder the rapid exit of fiery Mario Andretti from the 4wd Lotus after suspension failure on lap 3, and Andretti's just as rapid exit from the pits and the race course after that. Giving the little USAC champion the number three car on his three car team may well cost Chapman some sleepless nights when he crosses the Atlantic next spring in search of Indy drivers for his missiles.

The problems of Chapman and the Lotus team shouldn't detract from Rindt's first rank performance. Following Jackie Stewart's clinching of the Driver's Championship two weeks before in the Grand Prix of Italy, he and his Matra-Ford were clearly the combination to beat. Stewart had announced earlier in the week on NBC's Today Show that he was going after



U.S. Grand Prix winner Jochen Rindt in the Lotus-Ford, all alone in first place, winds it up out of the pit turn. This was his first Grand Prix win in five years of trying.



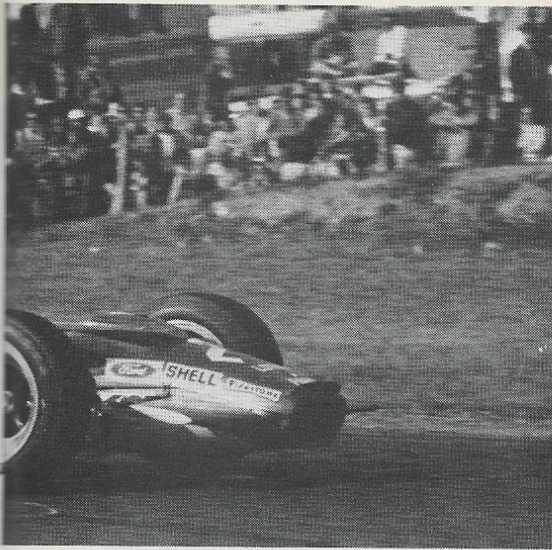
The Brabham boys, Ickx (No. 7), Courage (No. 18) and the boss (No. 8) during their dual for second spot. Brabham pushed Courage to his finest drive ever.

text and photos by Bill Jackson

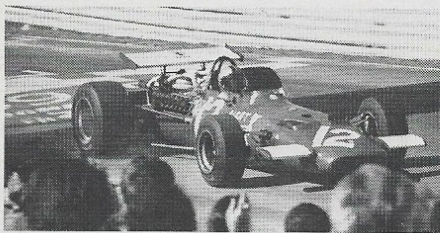
Jimmie Clark's seven-wins-in-a-season record. Rindt was also probably contemplating Stewart's fraction-of-a-second victory over him in the Italian Grand Prix, as he went out on practice day and took the pole position with a 1:03.62 lap. Stewart managed third position with 1:03.77, with Denis Hulme's McLaren sandwiched between at 1:03.65.

Nobody was exceptionally happy with the way things went in Friday's

practice except the tire companies, who got a chance to test their rain rubber when it poured throughout the session. Saturday was clear and a bit cold. Drivers were calling at the pits to thaw out as well as make suspension setting changes. Track announcer Innes Ireland commented that something on the order of \$200,000 worth of engines were changed Friday night. Most had arrived at the Glen with their Canadian Grand Prix engines still in and decided to make



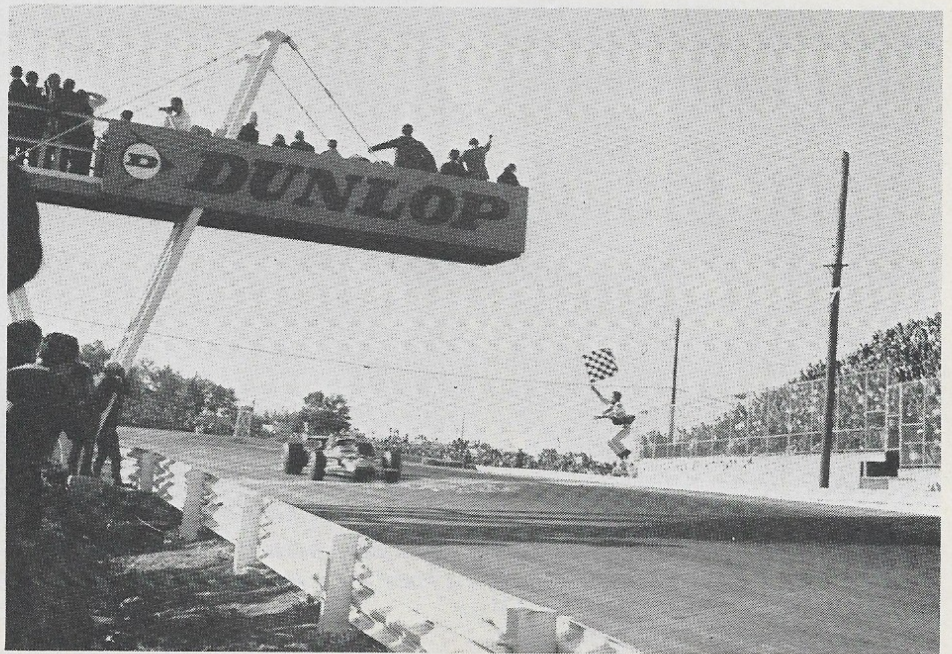
Lotus chief Colin Chapman (left) and Austrian driver Jochen Rindt were all smiles during Saturday's practice, perhaps symbolic of things to come.



Pedro Rodriguez never seemed completely happy with the NART Ferrari, which appeared to be down on power.



A cold Graham Hill rests his eyes and tries to keep warm during Saturday's frigid practice session.



Winner Rindt in the Lotus-Ford receives the traditional checkered flag welcome from Tex Hopkins at the conclusion of the 1969 U.S. Grand Prix. Tex jumps higher than any starter in the business.

the swap Friday rather than burn the Saturday midnight oil.

Jacky Ickx, fresh from his Canadian Grand Prix win, had the worst luck in practice. When the wing broke on his Brabham, he made a rapid off-track excursion, bending his suspension in the process.

There were 18 cars to face starter Tex Hopkins' lavender suit and green flag on Sunday. In addition to Rindt, Hill, Jo Siffert, Pete Lovely and Andret-

ti in Lotus's; there were Stewart, Jean-Pierre Beltoise and Johnny Servoz-Gavin for Matra-Ford; Hulme and boss Bruce McLaren in McLarens; Piers Courage, Jacky Ickx, Silvio Moser and boss Jack Brabham in Brabham-Fords; John Surtees, Jackie Oliver and Canadian millionaire George Eaton in BRM's; plus Pedro Rodriguez in the NART Ferrari.

Tex flagged the group off for warm-up laps and that's as far as Bruce McLaren got, blowing his engine before the

start. Maybe those hippie types who decided the edge of the track was the place to watch from, causing the whole show to be 20 minutes late off the mark while the police convinced them otherwise, might chip in and buy Bruce a new engine.

When the flag did fall, Rindt was away first with Stewart right on his tail, while poor Denis searched for the right gears. Chapman was all smiles when

(Continued on Page 58)



COLIN CHAPMAN SETS 4wd PACE

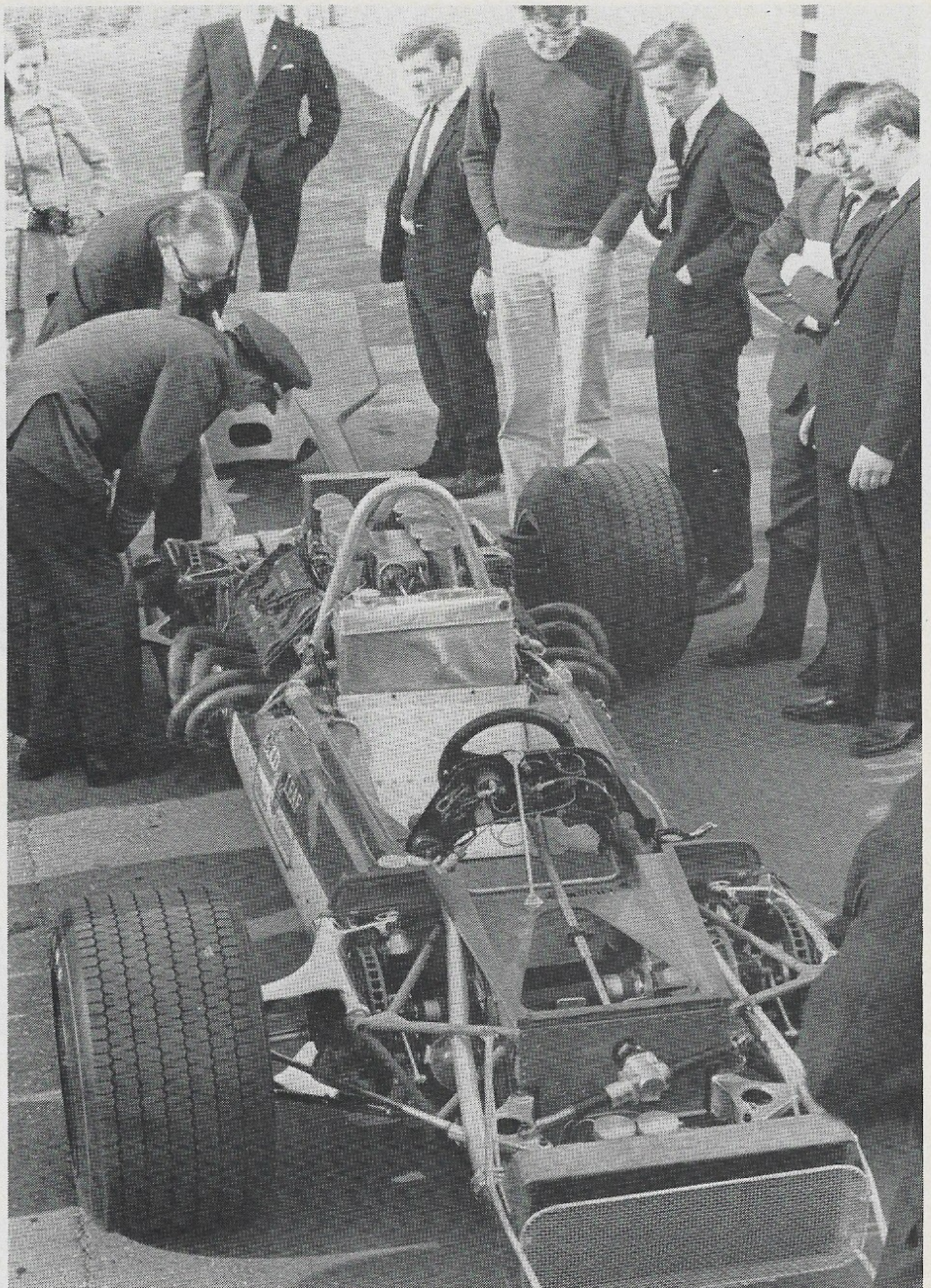
text and photos by Joseph Lowrey

A rare stint at the drawing board proves once again that Colin Chapman can design cars that others will be forced to copy.

We asked him to (WCG, Jan. '69), and he did! Colin Chapman really has taken time out from being a tycoon to become our most brilliantly original designer again, and whoohee! His four-wheel-driven Formula 1 car for Gold Leaf Team Lotus made its first public appearance as a car which needed development and which drivers had to learn about, yet obviously it must launch a new trend in race car design.

Like Chapman's rivals, yours truly has accepted the obvious view of four-wheel drive — that it would make a racing car bigger and heavier but that extra traction would improve the acceleration out of slow turns. Colin Chapman wasn't as short-sighted as the rest of us.

Four-wheel drive went onto the turbine-powered Lotus for Indianapolis in 1968 because that sort of engine responds slowly when you tread on the accelerator or when you release it. So, four-wheel drive let four-wheel brakes be used against the engine without upsetting the car's stability. At Indianapolis where the lowest cornering speed is 150 mph, four-wheel drive proved to give more cornering power than did two-wheel drive. So, Chapman has thought it worth re-thinking race car design radically; specifically, to evolve a four-wheel-driven Formula 1 car small



This view shows clearly how the driver's feet are well forward of the front "axle" with the differential off-set to the left.

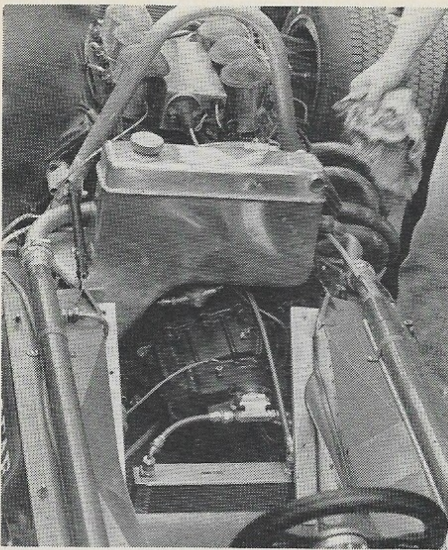
enough and light enough to suit fast as well as slow circuits.

Maybe the most important thing about the Lotus 63 is that it does not have gigantic rear tires. Four-wheel drive lets the weight and the acceleration-cornering-braking stresses be divided much more equally between all wheels. Drive shafts to all wheels can be used to transmit the braking effort from in-board-mounted discs, so road wheels need no longer be big enough to accommodate brakes inside them.

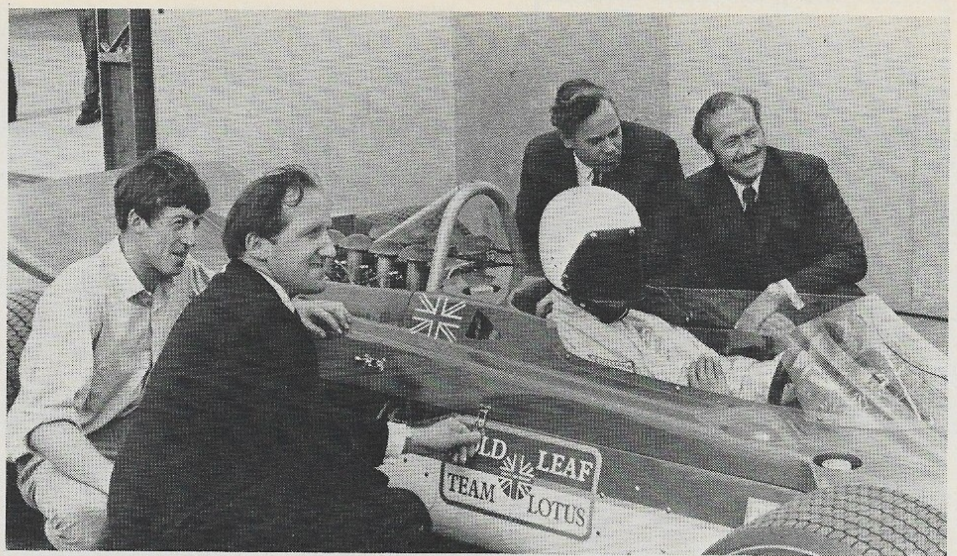
Chapman and his chief designer on this project, Louis Philippe, have planned the Lotus 63 around wheels of only 13-inch diameter. The rims are 12-inches wide at the front and 15-in-

ches wide at the rear, reducing tire overall diameters to about 33 inches. Both weight and frontal area have been reduced, yet so light is the car that these Firestones only need inflation pressures of around 13 to 15 pounds per square inch when lapping the Lotus test track at around 120 mph.

In having its engine behind the driver this Lotus 63 follows conventional racing practice, as the driver could not lie back with his seat about four inches above road level if he had to look forwards over the top of the engine. Compared to its rivals, however, everything on the new car has been moved forward. Figures aren't quoted but front/rear weight distribution is prob-



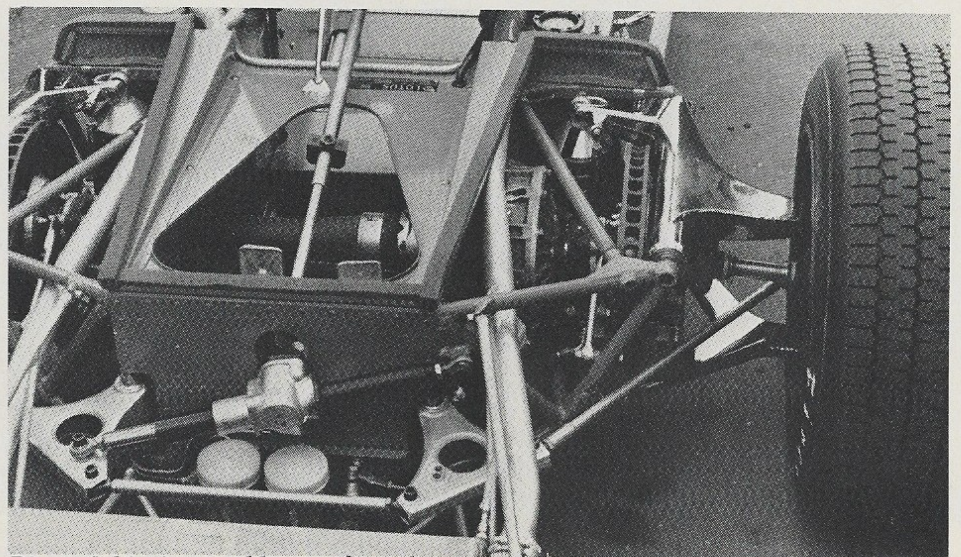
View with the driver's seat removed shows the 5-speed Hewland-gear transmission ahead of the engine, giving a weight distribution of about 45/55.



The Chapman team from left to right: the always nameless but indispensable mechanic, co-designer Louis Phillipe, engine designer Keith Duckworth, test driver John Miles and Colin Chapman.



Integral aerofoil also acts as an effective fairing for the rear drive components, the front being left open to the breeze. Unlike Indianapolis, there is no thought of banning all-wheel-drive in Formula 1.



Discs of this size would never fit within a reasonable wheel diameter and thus they are inboard of the drive shafts with the additional advantage that they become sprung weight.

ably around 45/55 instead of the more usual 30/70 spread. The Cosworth-designed V-8 Ford engine is further ahead of the rear hubs than usual, an all-indirect 5-speed gearbox incorporating Hewland gears is ahead of the engine instead of being behind it and the driver sits with his feet ahead of the front hubs.

The 13-inch rim diameter permitted 35 degrees of steering deflection in either direction so that the driver can catch any threatened skid, plus having a little clear space inside them for suspen-

sion, steering and drive components. So, suspension wishbones taper to slender outer extremities. The lower ones look especially lacking in fore-and-aft rigidity until one realizes how much less stressed they are when drive shafts take torque reaction to inboard brake mountings.

To clear the various pieces of mechanism, however, an odd three-piece steering track rod has been needed, its outer sections sweeping forwards at 45 degrees from the steering arms on the hubs to bell-crank idlers on the chassis nose. The steering rack has one end of

its case pivoted on the chassis, and the rack pushes or pulls on the right-hand bell crank. A universal joint in the column allows for the steering gear's slight movement relative to the hull.

Brakes located on the chassis frame make it especially vital to eliminate risk of shaft breakage. Luckily, small diameter wheels reduce the torque loadings which either tire inertia or road adhesion can put on the shafts. Inboard brakes offer superior performance on at least three counts. Disc diameter is less
(Continued on Page 59)



The SAAB team of Simo Lampinen and Arne Hertz blasts its way through a snow-covered forest road in one of the larger Scandinavian events, the K.A.K. Rally.

The months between Thanksgiving and Easter roughly mark the season of one of the toughest competitive sports in the world, the international road rally. A rally, in the European sense of the word, is a far cry from the Sunday afternoon outings engaged in by the sports car clubs in this country. The typical American rally is a time-speed-distance event where points are accumulated on the basis of precise arrival at checkpoints along the route, and it has been said that one needs more ability with a slipstick than a steering wheel to win such an event. On the other hand, the international rally is an all-out torture test of car and driver over

The International Road Rally...

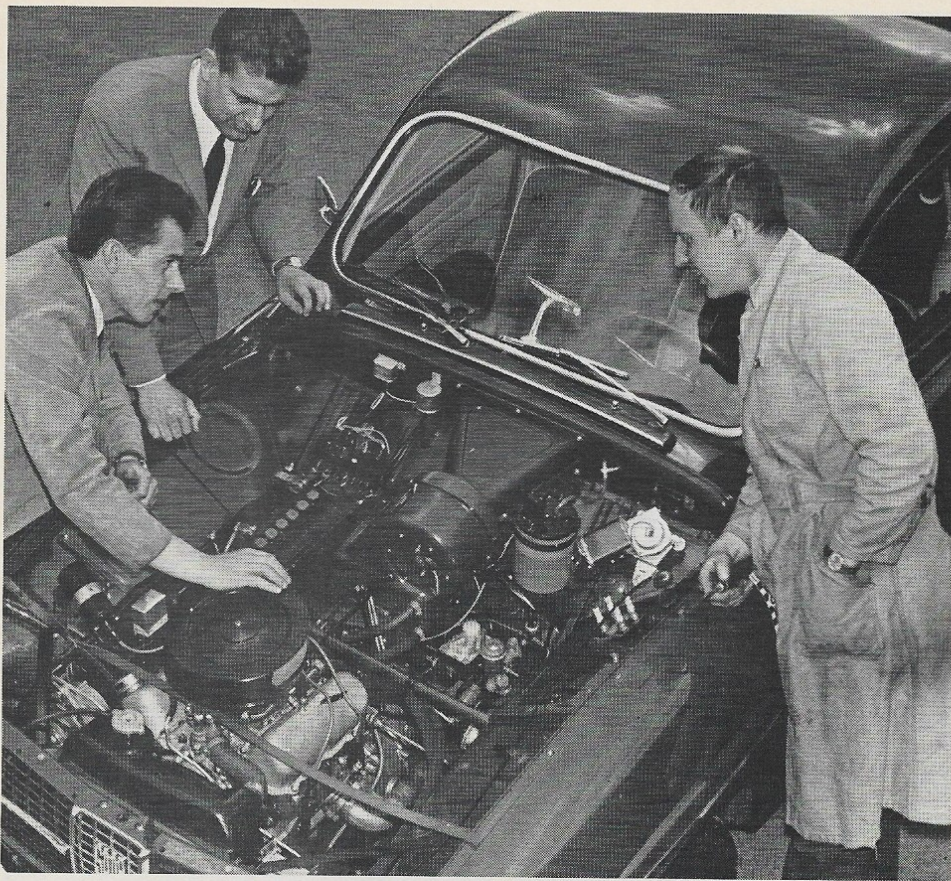
hundreds of miles of the worse roads imaginable.

While there are still set times for each car's arrival, the distances between checkpoints are such that drivers must go flat out to make them. Being one minute late can cost a team as much as 60 points. In addition to the time factor, these international rallies also measure a competitor's driving ability under incredibly rigorous conditions.

The Scandinavians are great lovers of

this tough, demanding professional sport. Some of the best known rallyists — like the Swedes, Erik Carlsson and Tom Trana, and the Finns, Simo Lampinen, Timo Makinen and Rauno Aaltonen — developed their driving skills on the winding, gravel roads of their native countries.

One of the world's major tests of man and machine is the RAC (Royal Automobile Club) Rally held the last of November. The route includes some



SAAB factory driver Tom Trana (left front) began his rally career with Volvo and has had two victories in the tough RAC Rally. Team manager Bo Hellberg stands next to him.



These conditions, typical of the RAC, are considered suitable for flat-out speeds. SAAB has dominated this rally in recent years.



Many a Peugeot has been sold as a result to their victories in the Safari. In terrain such as this, the main hazards are native road blocks and wild animals.

including rugged mountain tracks, logging roads and the gravel wastes of military reservations. Jim Gunn, long-time organizer of the Shell 4000, has been trying to revive interest in a similar cross-Canada event for 1970.

By all odds the two most important rallies held each year, in terms of publicity and the prestige attached to the winning car, are the Monte Carlo Rally and the East African Safari. Very few factories in Europe can ignore these events from which they derive an enormous amount of experience toward improving their cars. Teams of three and more cars predominate and the advertising mileage wrung from an overall victory in either the Monte or the Safari is considered well worth the time and money spent. SAAB and British Leyland; with their Mini-Cooper S, have been very successful in exploiting their wins in the Monte Carlo Rally, and who can think of the East African Safari without recalling the string of victories racked up by Peugeot?

In the Monte Carlo Rally, which has attracted over 400 entries in years past, competitors start from a number of European cities such as Athens, Warsaw, Lisbon, London, Oslo and Reims and

(Continued on Page 64)

Torture Test for Cars by Richard Senter

1200 miles of special speed stages where cars are raced against the clock on Britain's roughest forest roads, SAAB seems to have dominated the RAC Rally in recent years. They took first and second place in 1968 and, thanks to Erik Carlsson, won three times in a row, in 1960, 1961 and 1962.

We have nothing in this country to compare with the European rally. However, several American enthusiasts, such as former Sports Car Club of

America National Rally Champion Scott Harvey, have gone north of the border and found competition more to their liking. The three day Canadian Winter Rally offers everything from heavy snow and glare ice to record low temperatures and 50 mph winds that drive opaque curtains of snow across the roads.

Now defunct, the Shell 4000 was once the world's longest car rally. It ran over some of Canada's toughest terrain,



The late Charles F. Kettering of General Motors used to say that the difference between a new car and a junker was about six ounces of metal. What he meant was the useful life of a car is measured by the time it takes for this seemingly small amount of material to wear away from such vital areas as crankshaft journals, cylinder walls, and other bearing surfaces and moving parts. With proper care *any* passenger car will cover well over 100,000 miles before Boss Kettering's statistical amount is subtracted from the vehicle's constituted mass. However, it takes only a few small slips in an automobile's servicing and maintenance to make those six ounces disappear in a very few seconds!

After looking into the case histories of several dozen vehicles that had breathed their last on turnpikes and freeways, three factors immediately loomed greater than all the others. Not surprisingly, *improper lubrication* was a paramount condition, but right beside it

THE TOP THREE ENGINE KILLERS

by David N. Wenner

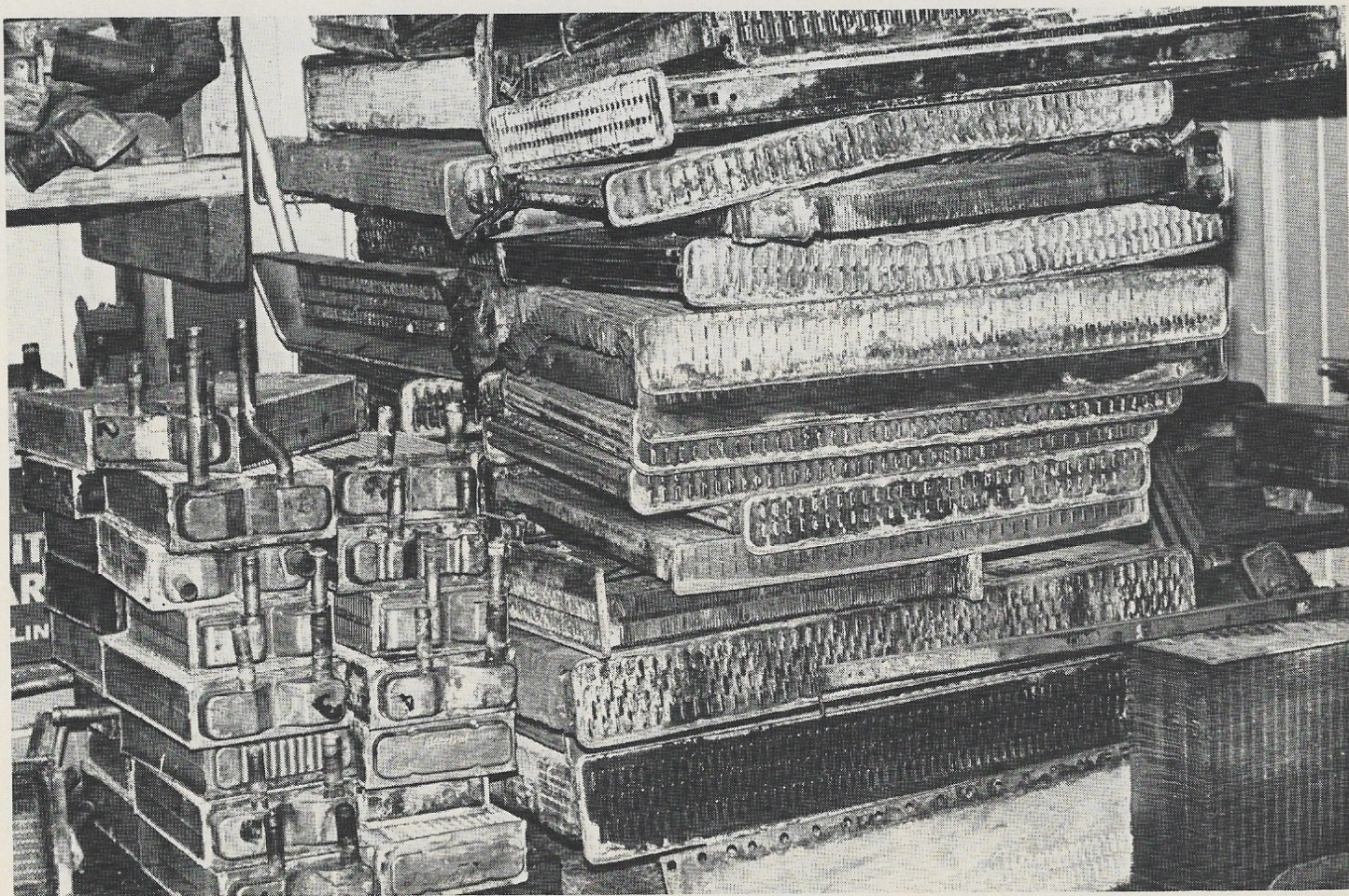
After reading this article, you might say "I already knew all that!" The question, though, is do you practice what you know?

came *faulty cooling systems*. A third consideration was *poor owner-driver judgement* as to the engine's operating limits.

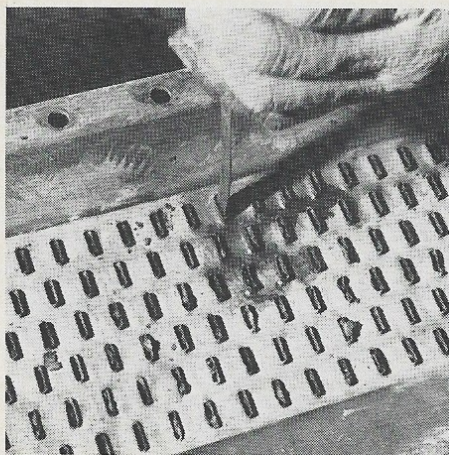
This article is not intended to outline all necessary phases of proper engine care, but rather to point out those mistakes by car owners that most frequently send their engines into "the deep six." It's not information that you're likely to hear from gas pump jockies since it could have an adverse affect on the sales of certain highly profitable items. In fact, trouble often starts when service station personnel are trained to sell an article that will turn a fast buck regardless of the eventual misery it may cause the buyer.

Lubrication Taboos

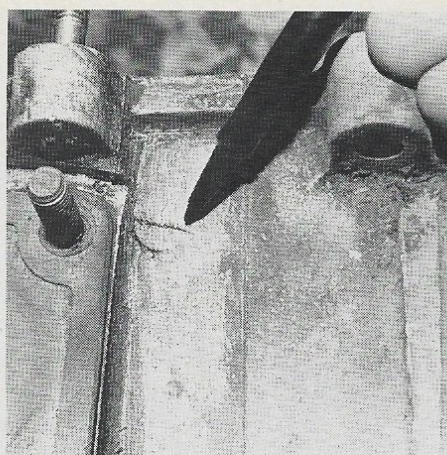
How many times has a filling station attendant asked if you want the fifty-cent, sixty-cent, or seventy-five-cent oil? A question like this makes no sense at all. The price per quart has exactly



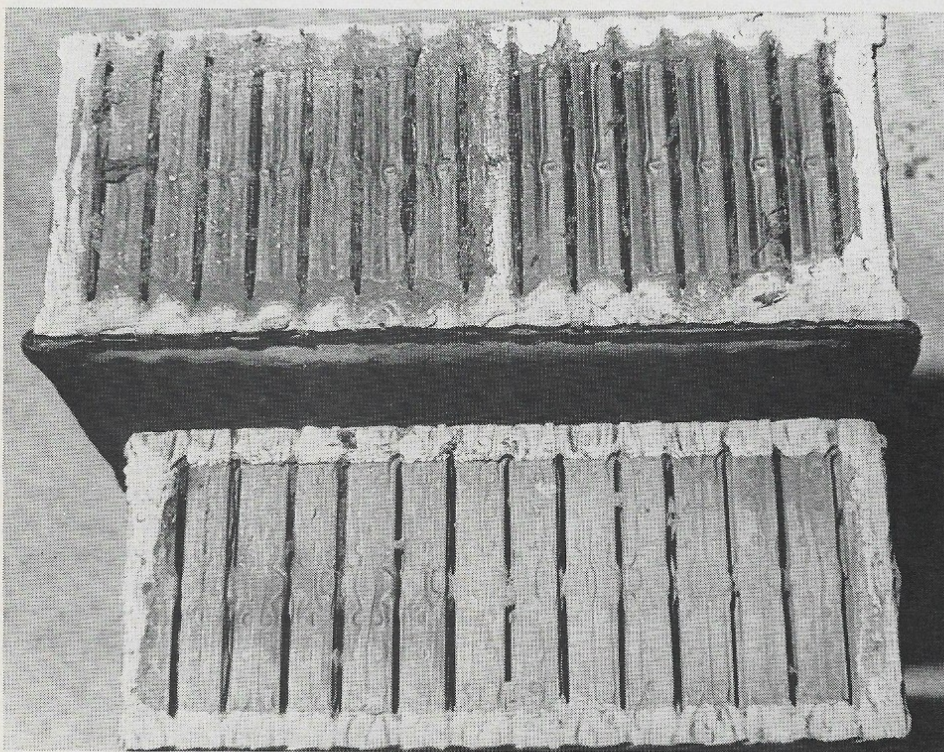
Plugged radiators are the No. 1 engine killer. This pile in one corner of a repair shop were all clogged by the improper use of leak sealing compounds.



A radiator is "rodded-out" by forcing thin metal strips through its tubes. This big earthmover radiator killed a \$4,000 diesel. Cause: "deadly ditch water."



When a connecting rod fails as a result of poor lubrication or over-revving, it may damage almost every other part in the engine. Note this cracked VW crankcase.



Water spaces in top heater core are plugged by leak sealer in combination with rust. Lower core is "normal."

nothing to do with the type of oil you should use in your car.

All car makers now specify motor oil having an MS (severe service) rating. The cheaper grades of oil sold at filling stations are often rated MM (moderate service) or ML (light service). These oils are manufactured for use in certain older cars that could exist on such lubricants but not, however, cars that required MS oil when new but have merely gotten on in years. Lawnmowers and other pieces of small-engine equipment may also use these lesser grades.

WORLD CAR GUIDE

The fact that service stations will often put them into someone's car just because the driver tends to pinch pennies is about as ethical as a doctor who would use Type A blood in a Type B-Negative patient just because it's easier to get

Aside from a willingness to put oil into their cars that does not meet the auto manufacturer's specifications, here are the other car owner mistakes that regularly cause engines to self-destruct:

1. *Irregular or infrequent oil changes.* This is particularly common

when an engine is burning or leaking oil. The owner just keeps adding a quart at a time and never changes it. As a result acids, water and sludge accumulate in the lubricant causing increased wear and plugging of oil passages.

2. *The "pre-vacation" oil change.* Here's a good-intentioned goof that ruins hundreds of summer trips every year. After driving around slowly in town for eleven months, the car is lubed up for the annual vacation. Unfortunately, its oil hasn't been changed as often as it should have been, despite the fact that the owners' manual clearly states that changes should be more frequent when most driving is done slowly and on short trips. As a result of this, sludge has formed in the bottom of the crankcase. A nice fresh batch of high-detergent oil is poured in just before the vacation jaunt, and the engine then driven at high speeds in warm weather. Then, when the sludge loosens up and plugs the oil-pump intake, you can scratch one engine.

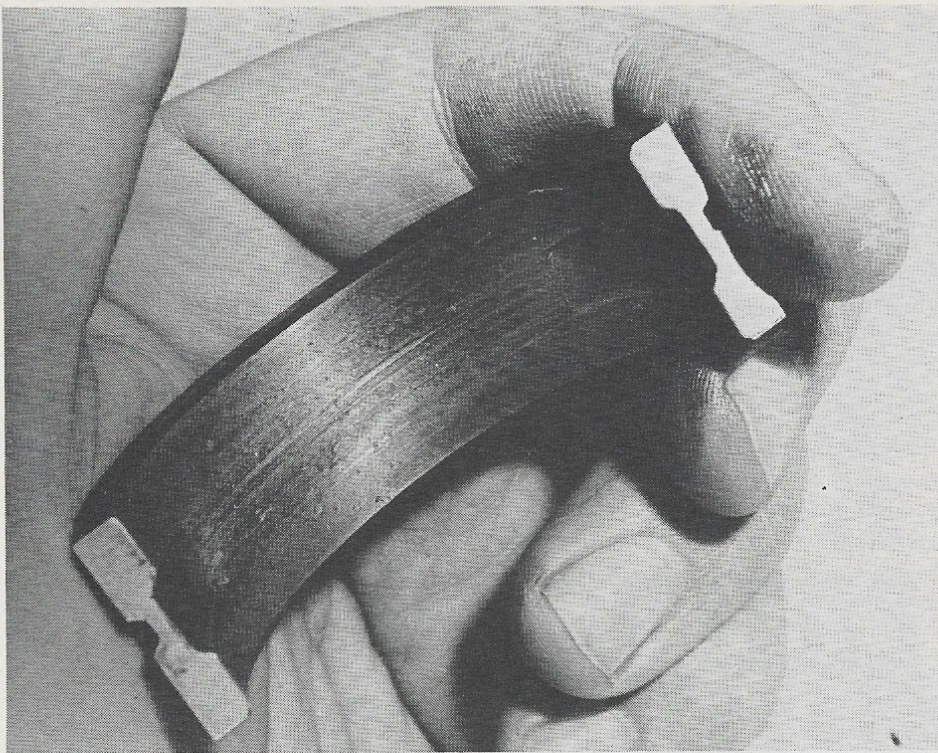
3. *The Volkswagen in winter.* Because the VW engine's cooling efficiency is high and its oil capacity small, a great deal of water condenses in its crankcase in cold weather. This is, naturally, most serious if many short trips are taken. If your daily check of the oil dip stick seems to indicate that the engine is "making" oil, you'd better start changing it twice as often as normally. The ruined VW crankshaft in the photos was destroyed by taking a high-speed drive after short trips had converted the crankcase contents to about 40% water.

4. *The "forgotten" filter.* This happens when the owner changes oil regularly but never replaces the oil filter. He remembers the old days when cars didn't have oil filters, and sees no reason why his car shouldn't run just as well with only periodic draining and refilling. Trouble is, he's forgotten that in the good old days *oil changes were performed much more frequently.* Ultimately, the filter plugs, and about one or two oil changes later his bearings are beginning to look like the scored and pitted example in the photos. When a rod finally lets go, it's curtains for his engine.

Cooling Calamities

Faulty cooling systems may actually account for more powerplant failures than anything that has to do with the oil. Try these on for size:

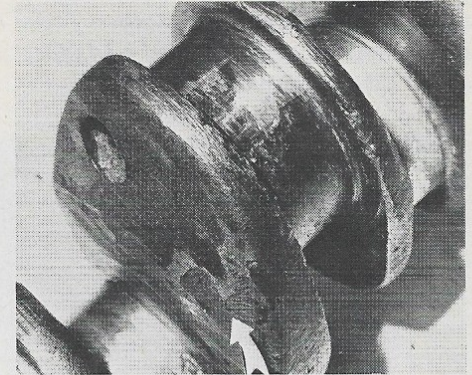
1. *Deadly ditch water.* Streaking along the interstate at high speed, the driver is suddenly aware of a "hot" odor and notes a rising temperature gauge.



Dirty, acid-contaminated oil caused the scoring and pitting in this bearing shell. Money saved on infrequent oil changes won't offset expensive repair bills.



An MS rating on the oil you use is a must for all modern cars. Low priced oils are often rated only MM or ML.



Baked-on sludge indicates that this crankshaft journal got mighty hot before the con rod welded to it and broke off. Water-diluted oil was responsible.



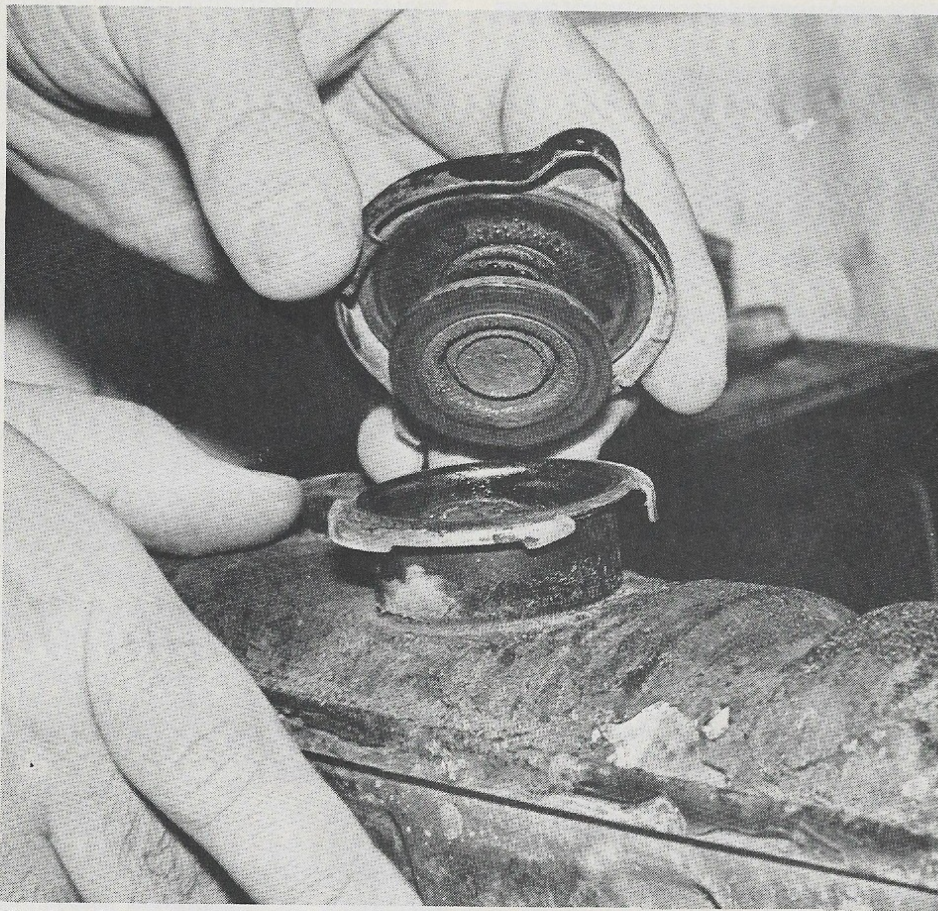
Collapsed and flattened hoses such as this can restrict coolant circulation and cause severe overheating. They may soon burst under pressure also.

Being miles from a service area, and unwilling to pay for emergency road service, he solves the low coolant level problem himself with the help of a rusty tin can and water from a nearby ditch. This might have worked on Grandpa's Model T, but when the bugs, dirt, and silt plug one or two tubes in a modern radiator it's usually enough to cause overheating at high speed.

Watch out for the water cans at filling stations, too. They are frequently used as receptacles for cigarette butts, and provide a handy place to rinse the sponges used to clean bug-splattered windshields. If you have to add water, make sure that it's from a clean source.

2. *Too much antifreeze.* If the car maker says 50% antifreeze and 50% water, stick to it. Using 100% permanent coolant offers little, if any, additional protection against freezing and it also may cause elevated operating temperatures. Excessive temperatures mean faster piston, cylinder and ring wear.

3. *Permanent use of "permanent" antifreeze.* Read your manual carefully, and check the change interval specifications on the antifreeze you buy. Keeping the same antifreeze in service for



Check radiator level when the engine is cool. Don't let service station men remove cap when the engine is still hot or coolant loss will result.

more than one year usually means the beginning of a rust-choked radiator. Rodding out a radiator costs about \$35. Then add in a new water pump, and perhaps even an engine destroyed by overheating and the few dollars saved by re-using last year's antifreeze start to seem pretty ridiculous.

4. *Leak sealer silliness.* Service stations like to push the sales of leak sealing compounds because they make a tremendous profit on the stuff. One can in a *freshly cleaned* cooling system will cause no harm, but in a rusted cooling system, or when several cans are added to the coolant in an attempt to plug a large leak, the results are disastrous. Rust particles are cemented together and bonded to the radiator tubes. The sealer-rust mixture can set-up as hard as concrete, and the radiator is either ruined or must be dismantled and cleaned which is slow and expensive work. Heater cores nearly always have to be scrapped. It may cost more than a can of sealer, but if you have a radiator leak take the car to a radiator shop and have it soldered. You'll save money in the long run.

5. *Check the water?* That used to be

routine in the old days whenever you stopped for gas, but service stations that insist on doing it with modern cooling systems are setting you up for trouble. Pressurized cooling systems will start to boil the moment the cap is released, causing an overflow and loss of coolant. Check the radiator level only when the engine is cool. Several hot "checks" made at turnpike service plazas often lead the unwise motorist to commit the "deadly ditch water" crime later on.

6. *Cleaners versus aluminum.* Some radiator and cooling system cleaners are not safe for use with aluminum radiators or engine blocks. This is one of the reasons that the aluminum engines once offered by GM and American Motors are no longer with us. Too many were ruined by filling station men who poured caustic cleaners into them. If you have aluminum parts anywhere in your cooling system (which includes the block and head), make sure that the wording on the cleaner can clearly states that the contents are safe for aluminum.

Day of (Bad) Judgment

Needless to say there are many other

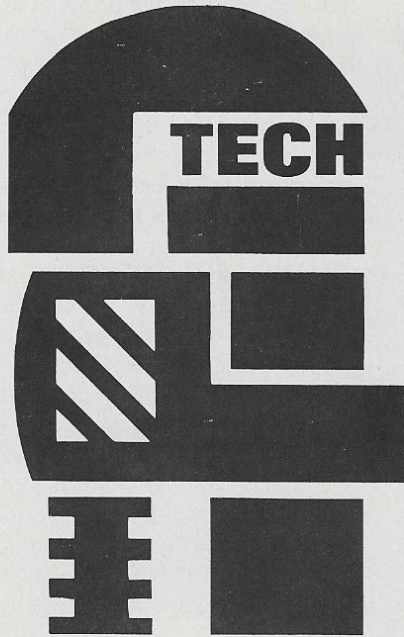
aspects to cooling system maintenance that could be mentioned, but those listed above are the ones that murder the most engines. The last of the "big three" engine killers is poor driver judgement. This seems particularly to be a problem for a certain class of foreign car owners who feel compelled to show everybody on the road that their little "bugs" can pass anything else that rolls. However, poor judgement is also responsible for destroying engines when drivers fail to heed obvious warnings that all is not well under the hood.

1. *Red line ridiculous.* When some drivers are confronted by a real live tachometer for the first time, its red line beckons them with a voice clearer than that of a siren calling to a sailor who has just spent twenty-eight months at sea. These drivers treat the red line as a kind of minimum shift point rather than as a "no-no" that is *seldom* to be approached and *never* transgressed. High speed downshifts and "winding it out" in the gears is acceptable in competition if you've decided that it's worth this risk to win, but in daily driving, it only hastens the day when the car's original engine becomes a permanent decoration in the corner of your garage.

2. *Press on regardless.* "Oil pressure five pounds below normal, water temperature needle in the red. Maybe I can make it to the next exit (side street, garage, gas station, bar, or whatever) if I drive slowly." Ha! These famous last words are the best way known to man for stretching the cost of a minor repair into the expense of a complete new engine.

3. *"I get terrific performance/economy" syndrome.* Maybe you can get to sixty a fraction of a second quicker and achieve a top speed four miles per hour faster than anybody else with the same kind of car, but is it really worth it to set the spark timing ahead of the factory specs? "Power timing" has been a quick route to perforated pistons and busted cylinder heads for many a "sport." Then, old skinflint Charlie, the village cheapskate, gets the same results by running regular (or cheap sub-regular) in his engine that was designed for premium gasoline.

The next time you are tempted to commit one of these sins with your car, DON'T. Junk yards are filled with the results. When a rod goes out, a cylinder head warps and cracks, a valve breaks off or a piston is "holed," there is *always* some reason for it. Usually the driver will tell you that the car was a "lemon," but a look at the engine will show that it was the other way around.●



CLINIC

Questions of widest reader interest will be answered in this column monthly. These answers are prepared by our technical staff with the help of consultants who have many years of experience servicing the car involved. WCG, of course, can accept no responsibility for accuracy or applicability to a given situation although every effort is made to constructively help readers who have mechanical problems with their cars. Due to the heavy volume of queries, none can be answered personally so therefore do not include postage with your submissions. To be considered for inclusion in this column, send your question to: Tech Clinic, World Car Guide, 4207 Palos Verdes Drive South, Palos Verdes Peninsula, Ca. 90274. Please limit queries to a single problem and be as specific as possible.

VOLKSWAGEN

QUESTION: I bought a 1967 VW sedan when it was a year old and have had numerous problems with the brakes. To my knowledge most all VW brakes make a squeaking noise, but my brakes pull to the left at unexpected times and make a grinding noise when operated in turns. The dealer has tried numerous adjustments without success and now tells me that this is common to all VW's and unavoidable. That I don't believe. Please, can someone help me? My brakes are driving me crazy and into the poor house!

*Frederick T. Emmel
Springfield, N.Y.*

ANSWER: The squeak can be temporarily cured by scrubbing the lining surface with a kitchen cleanser such as Comet. The pulling and grinding noise could possibly be caused by a loose backing plate and as you say the grinding happens only in turns and the car pulls to the left, check the left front brake first. You'll find that the backing plate is attached by three bolts which should be torqued to 5.5-6.5 m/kg (40-47 lbs. ft.). The same torque figures apply to the right side as well as to the rear where there are four bolts.

QUESTION: Living in Puerto Rico and owning a '64 Notchback 1500S with dual carburetors combine to really put

me in left field when it comes to service and parts. One of the 32PDSIT carbs has a leak in the float which is so slight it can't be found, but the float will become about half full of gas in three or four months. Don't suggest J. C. Whitney as the repair kits this company stocks are not for my carburetor. Can you please help me?

*Richard L. Gagnon
Fajardo, P.R.*

ANSWER: The Arnolt Corp., Argonne Road, Warsaw, Ind. 46580 are the U.S. distributors for Solex carburetors and should be able to supply you with a new float. If you want to fix it yourself, drill a small hole in the top of the float, allow the accumulated fuel to drain completely through this, coat the empty and dry float with a solution of soapy water and then blow gently into the hole (don't use compressed air). Your leak will probably show up in the form of a bubble and once located, you can solder both it and the hole you drilled. Use a minimum of solder and sand off the excess as even this slight extra weight will affect the float setting.

QUESTION: I have a '68 beetle in which I've installed an Isky 3/4-race cam with hydraulic tappets and 1600-cc cylinder barrels. My problem is the carburetion. I'm using the stock carburetor which works except that it lets the

engine die at the first few stoplights. Should I install larger jets and if so, which ones? Hope you have some suggestions that will help or cure the problem.

*Gale Reed
Knoxville, Iowa*

ANSWER: Your problem can't be the main or air correction jets as these aren't in operation at idle. Your car has a solenoid operated idle jet and it could be that after your engine work, you left the wire to this disconnected. Or, of course, the solenoid could be inoperative. For a general guide to the size jets for your new displacement that will give you maximum cruise and high performance, see Tony Hill's "Hi-Performance Corner" in Dec. '69 WCG.

QUESTION: I used to be able to get neoprene valve cover gaskets for the VW bug that were completely troublefree and lasted the life of the car for \$.75 a pair. Are these still available and where can I get them?

*C.N. McGaughey
Chicago, Ill.*

ANSWER: We don't know of a source for valve cover gaskets made of neoprene other than that this material is used in the gaskets supplied by EMPI with their dress-up aluminum valve covers. This U-shaped gasket will fit only those, not the stock covers, which would make the overall cost somewhat more than \$.75 a pair.

QUESTION: Rumor has it that it's possible to purchase an air scoop for the beetle which is supposed to increase cooling efficiency by about 15%. Apparently it's attached to the water guides on each side as well as to the air vents. Have you any information on this unit? I enjoy reading WCG which is certainly the place to get ideas on how to improve the VW.

*Manley deRoux
Vancouver, B.C.*

ANSWER: Thanks for your kind comment. J.C. Whitney & Co., 1917 Archer Ave., Chicago, Ill. 60616 lists a fiberglass air scoop at \$13.95 plus 4 lbs. shipping via truck or REA which will fit '55-'69 VW sedans. It comes primed and ready for a color coat and mounts on the rain gutters above the engine lid. It's part No. 19-4323E. Text of the catalog comment reads "Users claim up to two more miles per gallon, six to eight miles per hour speed increase." Please, however, do not construe our answer as an endorsement of this product. For one, we are not aware of any chronic VW

cooling problem, particularly in your climate. Secondly, the VW cooling system is carefully engineered and any change in the flow of intake air could throw it off kilter, much as the fan on a liquid-cooled car becomes less than useless at highway speeds.

QUESTION: I have recently become a reader of your magazine and grab it as soon as it comes from the mailman. I'm very interested in my '69 Ghia and have had three bugs before so I'd appreciate answers to this list of questions:

1. Who makes additional goodies for the Karmann Ghia?

2. What is the widest size wheel the Ghia can take without fender alterations? Can all four wheels be changed? Will it change or damage the steering geometry or cause bearing problems? Are there radial tires made for the wider wheels?

3. If I change over to a double carburetor kit, is it necessary to alter other parts like the camshaft, valve springs, muffler, etc.?

4. Which is better for the car, a double carburetor or supercharger, to get low end power? What other changes would you recommend? I don't plan to race or rally.

5. My Ghia starts okay in cold weather, but in summer I have to crank it for a minute or more. Do you have a solution for this?

Francis Laping
Philadelphia, Pa.

ANSWER: 1. EMPI, whose address you'll find elsewhere in this issue, is a good source for speed equipment. For dress-up goodies, try Poly Pad Imports, 5000 Brookpark Rd., Cleveland, Ohio 44134 or Vilem B. Haan, Inc., 10305 Santa Monica Blvd., Los Angeles, Ca. 90025. Both firms have lavish catalogs which they'll send you upon request.

2. The Ghia will take a 5½-inch rim without fender alteration and 165 x 15 radials will fit this wheel. You won't have any bearing problems unless you reverse the rims. Steering will be a little heavier when parking but you won't notice it on the road.

3. and 4. A comparison of double carburetion and supercharging is academic because no one yet makes a supercharger for '69 or later Volkswagens. While not as impressive to look at, experts consider a 2V carburetor with a ram manifold and tuned (extractor) exhaust system to be superior to twin 1V carburetion, and it's also simpler to maintain and cheaper to buy. It will increase power measurably all through the range. EMPI's kit No.

TRMV 101 is typical, consisting of the carb, manifold and a special distributor. The latter is necessary because the 2V carb doesn't have a vacuum advance mechanism. The exhaust system is extra and there are any number of fine brands offered by our advertisers. No other alterations to the engine are necessary to obtain maximum benefits from this basic modification.

5. As to your starting problem, assuming your engine to be in top condition, we suggest you depress the accelerator pedal slowly while cranking in temperatures above freezing. When either the engine or the air is very warm, depress the pedal fully and don't pump it. These techniques insure the correct operation of the automatic choke mechanism for the conditions involved.

QUESTION: I've just bought a new '69 VW camper and since buying it, I've heard a lot about the possibilities of changing the fuel system over to bottle gas. Do you have any information on the subject? I'd like to hear the pros and cons and find out where to obtain the conversion kits.

Churchill G. Drake, Jr.
Portsmouth, Va.

ANSWER: Bottled gas, or LPG as it's called, offers both advantages and disadvantages and the latter aren't really outweighed unless you drive very high annual mileages. The conversion is relatively simple and the kits, including installation which in most states must be made by specially certified mechanics, cost between \$200 and \$300 at most LPG distributors. You can convert entirely to LPG or get a somewhat more expensive installation that permits operation on either LPG or pump gasoline. The special tank (usually 14 gals.) is

necessarily quite heavy because it must contain the liquified gas under very high pressure. Therefore, it must be mounted in a reinforced area, usually the trunk of a conventional car, and thus doesn't replace the existing gas tank. You can expect about a 10% decrease in economy due to the fewer number of btu's in each gallon of LPG, but you actually can go more miles on your dollar because currently it costs less per gallon than ordinary gasoline. The main disadvantage of LPG is lack of availability. Most freeway stations that cater to trucks have it, as many of these vehicles have been converted. Also, the fuel is widely used for refrigeration engines. In the countryside, however, or in large cities, you'll have to seek out a distributor who is usually forced by the fire department to locate on the outskirts of the trade area. The main advantage is the cleanliness of LPG. It contains no lead, carbon or sulphur and can't form sludge. This is why it is widely used for pumping engines and the like that must run continuously and reliably in remote locations. You'll find your oil will stay clean for 8000 miles or more with attendant infrequent filter changes. One trucking company that fleet tested LPG found that spark plugs lasted for 50,000 miles! Mt. Dora (Florida) cut the annual cost for routine maintenance on each of its three police cars from \$127 to \$37 by switching to LPG. There is no evaporative loss and the mixture automatically compensates for altitude. It is also relatively free of smog-causing emissions. That is the picture and the decision is yours. Perhaps a trailer or motor home owner who uses the stuff for cooking and refrigeration can advise you on availability problems he's experienced. ●

THE BETTER HALF

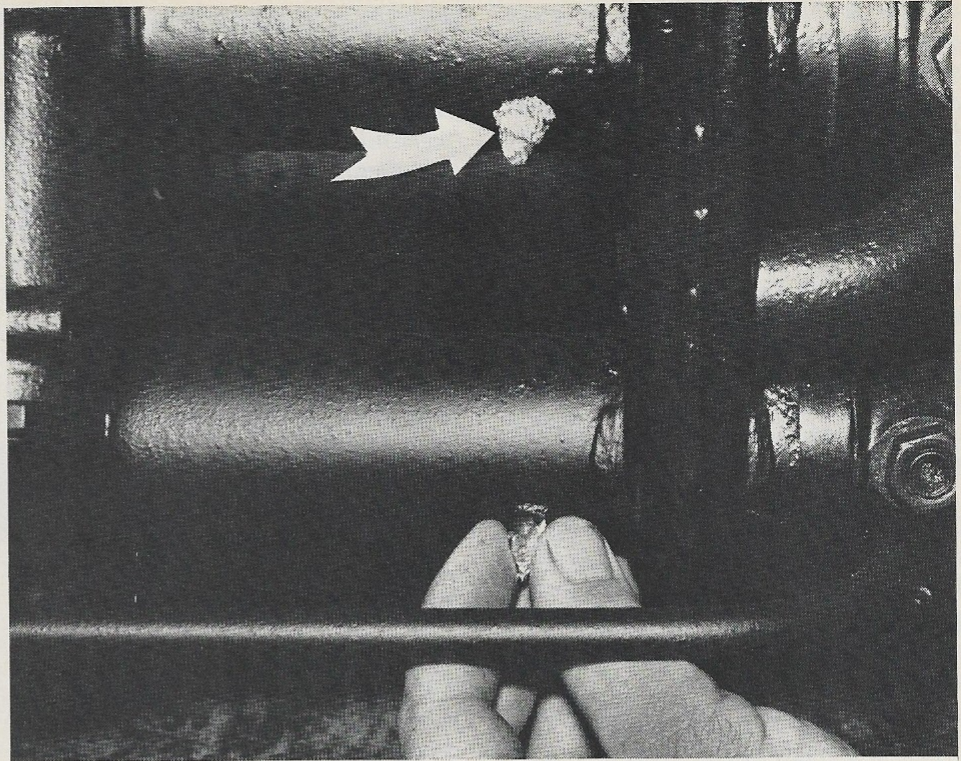
By Bob Barnes



"It's had very little use--the last owner couldn't even get it started."



LET DAVE DO IT
LET DAVE DO IT
LET DAVE DO IT



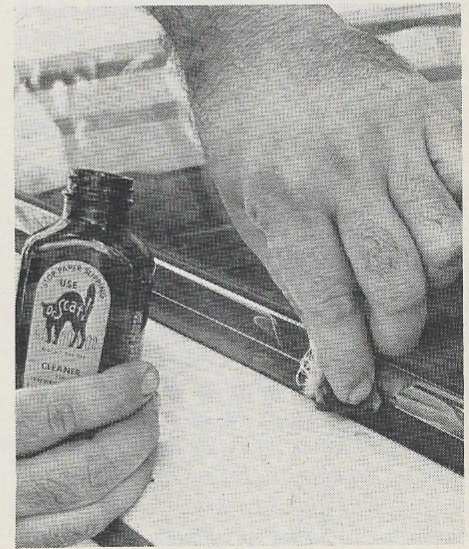
IT TAKES GRIT to ruin VW torsion bar, king pin, and link pin bushings, and one of the worst sources of such abrasive grime is to have it forced into the bearings along with the lubricating grease. This handy tip can save both time at grease jobs and money when you avoid a front-end overhaul, so why not give it a try? After wiping the grease fittings clean and lubing your car in the usual way, press a 3/4-in square of ordinary household aluminum foil over each fitting as shown. They'll stay on without trouble and keep the fittings immaculate until your next lube job.



CONSCIENTIOUS CAR OWNERS already know that a quarter cup of baking soda mixed into their car wash pail makes soaking off bug splashes a snap. But don't leave the package on the kitchen shelf! There are many more things that this common cooking product can remove from your car when used directly on the sponge in powder form. Its mild abrasive action and alkaline chemistry make it a natural for cleaning gasoline stains from around and under the filler cap, eradicating tree drippings, and rubbing out smears of road oil.



POURING OIL INTO A VW engine is a chore that's not easily handled even by the average push-in oil can spout. But slip the VW mill under the tail of a dune buggy and adding oil can be well nigh impossible! You'll keep the engine cleaner and avoid getting lube onto the ignition wiring by making a filler from an ordinary funnel and a length of large-diameter plastic fuel tubing (available at auto supply stores). If you want to keep service station attendants happy, carry it with you when you're out on the road.



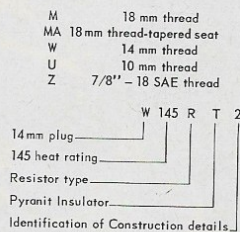
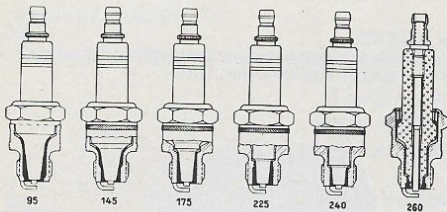
DRAB LOOKING rubber can spoil the appearance of any car. Not only does the rubber itself start to assume a grayed hue, but accumulations of soot and other air pollutants begin to adhere to its surface. Gummy rubber preservatives won't help one bit to restore its color, so try this suggestion before applying anything else: Take a bottle of liquid typewriter roll cleaner, and use it to scrub the rubber after your next car wash. You'll find that it cleans and renews the appearance of the window seals like nothing else can. It works fine on tires too!

HI-PERFORMANCE CORNER



by Tony Hill

A SPARK PLUG PRIMER...PART 1



As a primer to the understanding of spark plugs, it's necessary to understand the various numbering systems used by the different manufacturers as well as the heat range characteristics and construction details which are more or less common to all brands.

The accompanying diagram shows the system used by Bosch. Breaking down "W175T1" which is a standard plug for Volkswagens, you can see that the "W" stands for a 14mm thread diameter, the "175" spells out the heat range, the "T" means that the plug is a late design with a proprietary Pyranit insulator and the final "1" indicates specific design details. These include "reach" which is the length of the threads, the shape and design of the insulator and the location of the ground electrode.

We'll get into design characteristics next month but meanwhile, out of this numbering system come two important facts that you'll be considering when you select the proper plug for your high-performance VW engine. These are heat range and plug design, or "electrode executions" as Bosch calls the latter.

Heat range refers to the rate at which the porcelain insulator will dissipate the heat absorbed by it during the combustion process. Or, you could say that heat range is the means by which the tip

temperature of the insulator is controlled. This is accomplished by its length, shape and thickness. Its job is to withstand temperatures up to 5400 degrees F while combustion is taking place and then to absorb a drop to as low as 140 degrees on the intake stroke, this sudden cooling being the result of the fresh mixture flowing around the tip.

It's worth emphasizing that the insulator never reaches a temperature of 5400 degrees. Instead, it absorbs *some* of the heat which travels down its length to where it is transferred to the cylinder head through the spark plug seat and the plug shell.

If the tip of the insulator is allowed to reach too high a temperature, it will become incandescent and cause premature ignition of the mixture — a condition known as pre-ignition. When the air/fuel mixture is ignited before the properly timed spark is delivered from the distributor, the burning and expanding gases will be working against the piston while it is coming up on its compression stroke. Also, pre-ignition is more of an explosion than controlled combustion and the forces from it are enough to cause a severe loss of horsepower and therefore performance, not to mention the likelihood of engine damage. The resulting explosion, which is quite audible, is known as detonation. The "pinging" you sometimes hear when you take on a tank of marginal gasoline is a mild and usually harmless form of detonation. Extreme detonation can cause a complete loss of timing and the audible evidence resembles dragging a broomstick along a picket fence.

The temperature of the insulator tip therefore must be controlled within certain limits. The most important one is that it cannot reach or exceed the pre-ignition temperature of approximately 1560 degrees F as anything above that will spell trouble in capital letters. On the other hand, the tip temperature cannot fall much below 700 degrees during combustion or it will not be hot enough to burn off the

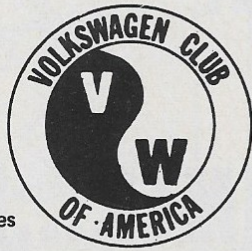
deposits formed by partially burned gasoline and oil. That situation, of course, is known as spark plug fouling.

An engine that has been blue-printed for high performance, with the inevitable increase in compression ratio, develops significantly higher combustion temperatures and therefore requires what is known as a "cold" spark plug. This plug will have a shorter insulator so that the cumulative heat buildup will have less distance to travel which in turn, causes more heat to be transferred to the cylinder head. The object, of course, is to avoid reaching the 1560 degree point of pre-ignition. However, if you used this plug in a stock engine, the heat transfer would be so rapid that the tip temperature would fall below 700 degrees, resulting in a buildup of deposits. These deposits conduct electricity which, following its usual path of least resistance, would then ground out through the shell rather than jump the gap between the electrodes.

The Bosch numbering system is particularly useful to use as an example because it is derived from the time in seconds that it takes a given plug to reach the pre-ignition point as determined in a special single-cylinder test engine. Thus, you can roughly determine the heat range only of competitive brands by cross-referencing their numbers against the proper Bosch application. You can't, however, determine equal capability and we'll discuss the reason next month.

Bosch recommends W145T1, W175T1 and W225T1 plugs for VW's, depending upon model and usage. Thus, the 145 plug will reach pre-ignition in 145 seconds which means that it is transferring heat at a slow rate. This is known as a "hot" plug and its application is for earlier engines with low horsepower ratings or in newer engines that are driven primarily around town. The 225, conversely, is the plug to use in your newer Volks if you're planning a high-speed vacation trip. The Bosch numbering system ranges from 95 to 440, the one extreme being for milk wagons and the other for race cars. ●

NEWS FROM THE



Compiled by Carole Kepes

The VWCA, P.O. Box 963, Plainfield, N.J., 07061 is a non-profit organization dedicated to helping the VW owner enjoy his car to the fullest. For more information send 25 cents for postage and handling to the above address. Annual dues \$7.00 plus \$5.00 initiation fee first year. Dues include subscription to this magazine, WORLD CAR GUIDE.

Have any of you members at large had any amusing or unusual VW-type experiences lately? One member writes that while at her local dealer looking at the new models, a small toddler stumbled up to a VW bug, patted it and said, "It's Herby!" Another family states they were driving down a suburban street and several youngsters yelled, "Look, here comes the love bug." Another flowered VW bug bears the sign, "The bug of love."

What's happening in your area? We would like to hear from you. This is your chance to speak up. We welcome your comments, suggestions, gripes, etc. — anything we can share with the rest of the club members. Send your comments to me, Carole Kepes, 4622 Penn Avenue, Dayton, Ohio 45432, and we'll try to print everything we receive.

Also, local clubs arise! What are you planning in the future, what has happened in the past or what are you doing now? We'd like for you to share your news with the other members, too. Give us some ideas for our own events and activities. Remember the two month lead time for printing and try to get your articles in early. But, for goodness sake, if you don't have all the information that far ahead to send to us, send us an article on how it was after it's over. Other members want to hear what is happening in your area!

DATES TO REMEMBER

February 15 — Winter Carnival 70 — rally and ice gymkhana sponsored by the Badger Beetles VW Club, P.O. Box 92, Muskego, Wisconsin 53150.

May — Das Mai Volksfest, Hawkeye Volkswagen Club, c/o Pat Heil, 1149 Country Club Drive, Marion, Iowa 52302.

June 19-21 — National Convention, Atlantic City, New Jersey.

Are you going to be in the area of one of the other local clubs soon? Here is an updated list of club addresses. Write them for information regarding events in their areas.

ARKANSAS

Arkansas Volkswagen Club
Margie Scott, secretary
P.O. Box 123
Little Rock, Ark. 72203

FLORIDA

Central Florida VW Club
Lavina Maszy, secretary
Box 8261
Orlando, Florida 32806

FLORIDA

Bay Area Volkswagen Club
M. Mason
2040 Alcazar Wy. S
St. Petersburg, Florida 33712

GEORGIA

Dogwood City VW Club
Rita Goldstein, secretary
Box 5375, Station E.
Atlanta, Georgia 30307

ILLINOIS

VW Club of Chicago, Inc.
Ray Link, secretary
P.O. Box 45620
Chicago, Illinois 60645

ILLINOIS

Heart of Illinois VW Club
Dora Lichtenberger, secretary
R.R. No. 1
Washington, Illinois 61571

ILLINOIS

Illowa Volkswagen Club
Dallas Schumacher, secretary
1941 23rd St. A
Moline, Illinois 61265

IOWA

Iowa Region, VWCA
Claudia Dougherty, secretary
P.O. Box 469
Des Moines, Iowa 50309

IOWA

Hawkeye Volkswagen Club
Pat Heil, secretary
1149 Country Club Dr.
Marion, Iowa 52302

KANSAS

Air Capitol Volkswagen Club
R. Chipman
2129 S. Water
Wichita, Kansas 67213

MARYLAND

Baltimore Volkswagen Club
Lynn Barranco, secretary
1000 Halstead Rd. A-3
Baltimore, Maryland 21234

MICHIGAN

Mid-Michigan VW Club
Alice Morris, secretary
12447 Sharon Rd.
Oakley, Michigan 48649

MINNESOTA

Gopher State Volkswagen Club
c/o Duan Arett
11231 President Dr. N.E.
Minneapolis, Minnesota 55433

MISSOURI

VW Club of Greater St. Louis, Inc.
Jane Weihe, secretary
Box 5975
St. Louis, Mo. 63134

MISSOURI

VW Club of Greater Kansas City
Marty Schilling, secretary
2925 Freeman
Kansas City, Kansas 66102

NEVADA

Vegas Volks
Gladys Mills, secretary
c/o Janette Berger
6509 Bristol Way
Las Vegas, Nevada 89107

NEW JERSEY

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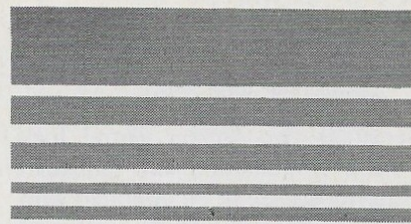
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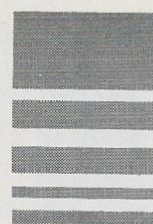
NEW YORK

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Grace Alley, secretary
600 W. 114th St.
New York, New York 10025
(Continued on Page 61)

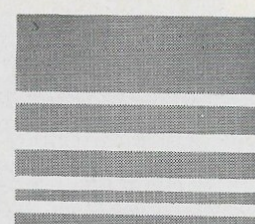
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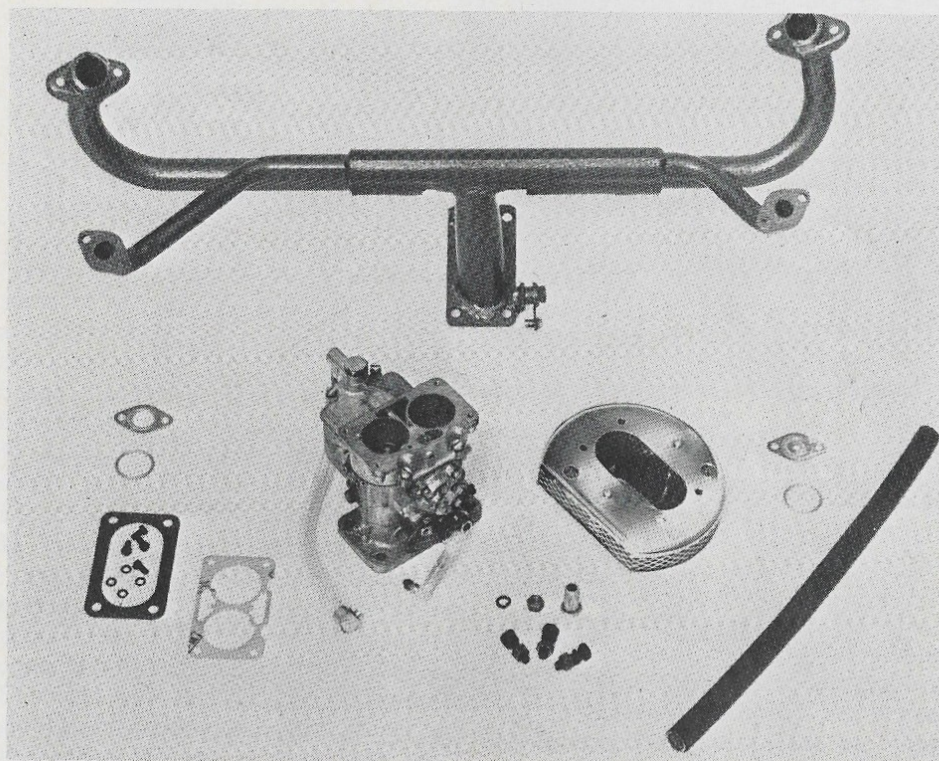
REFLECTIVE DOOR MOULDING:

Safety minded readers will appreciate this new plastic door edge moulding which not only protects your finish and the other fellow's (chromed steel moulding doesn't always do the latter) but reflects a bright red at night when you open the door in the face of oncoming traffic. In the daytime this product, which is a combination of Eastman's Tenite butyrate and Scotch-lite reflecting tape, looks like chrome. Available in 33- or 48-inch lengths, the mouldings are packaged in pairs for approximately \$1.49 at auto supply stores. If you can't find it locally, send a query to Silvatrim Moulding Div., Glass Laboratories, Inc., 863-65th St., Brooklyn, N.Y. 11220.

TWO-BARREL CARB KIT FOR VW's:

In this month's Tech Clinic we discuss the relative merits of installing two single-barrel carburetors or one 2V

WORLD CAR GUIDE



on Volkswagens and decided that the 2V set-up has the edge. This is particularly true when the carburetor involved is a Weber. This kit is rather expensive at \$175 but the Weber is the main reason. It's also claimed to be the original bolt-on for VW's and RPM says it will increase your top speed by 15 mph, take 7 seconds off zero to 60

times and give you 3 mpg better fuel economy. If you still don't believe, why not risk \$1 to cover postage and handling of a complete description of what the RPM kit does and how it does it. Mail your query to RPM Kits, 7248 Sepulveda Blvd., Dept. R, Van Nuys, Calif. 91405. Be sure and specify the year and engine size of your VW.

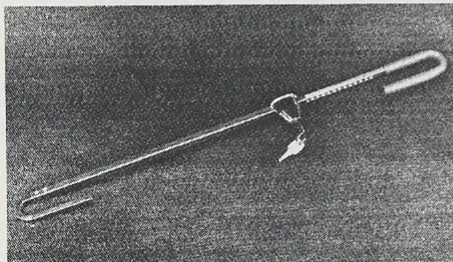
A CURE FOR CHILLY VW WINDSHIELDS?

Many an inventor has thought of heating the windshield wiper blades to facilitate removal of snow and ice but they've always been stopped first by the fact that rubber is a non-conductor and second, by the lack of a conductive substitute. Now "Thaw Blades," placed on the market nationally this November have solved the problem with a blade

made from a silicone-based elastomeric that will not only heat to 380 degrees F in five seconds but will wipe better than rubber in the summer. Sets, including wiper arms and a lighted, fused switch, run from \$29.95 to \$39.95 at retail and the maker claims that a do-it-yourselfer can install them in about 10 minutes. The various sets will fit 90% of



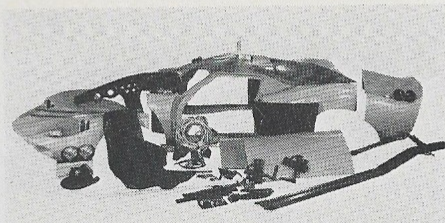
imported and domestic cars and trucks, including VW's, as the wiper arm is adjustable for both length and angle. Specific advantages include the fact that since the blades are heated by a separate switch, they can be unfrozen from their parked position prior to turning on the wiper motor and also, the elastomer is claimed to be impervious to grease, oil, alcohol and road salts. Check for their availability at your local auto store or service station or write Comstock Tool and Electric Co., % Kaplan Associates, 357 East 57th St., New York, N.Y. 10022 for the name of your nearest dealer.



HOW TO HOOK A CROOK:

"Krooklok" is the original English-made car-theft preventor that hooks from the steering wheel to the clutch or brake pedal. Made of heavy-duty,

high-tensile steel and chrome plated, the unit has adjustable telescopic tension rods to make it suitable for use in any make of car or light truck. The hand-crafted, five-tumbler barrel lock with 1000 combination and hardened steel interior can only be operated with a special key. No two units are keyed alike. When not in use Krooklok telescopes down to 22 inches length for storage. The importer says that Krooklok is the original, patented car anti-theft device and should not be confused with cheaper imitations. Price is \$16.95 postpaid from Poly Pad Imports, 5000 Brookpark Road, Cleveland, Ohio 44134.

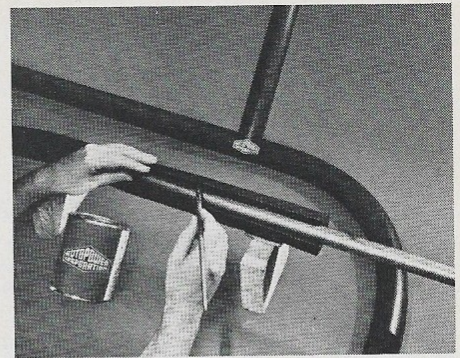


A COMPLETE AVENGER KIT:

Fiberfab must have taken to heart the article we printed a few months back where the author noted that it was a pretty shattering experience to spend upwards of \$800 for a body kit and receive some rather rough blobs of unpainted plastic and nothing much else. The feature car turned out to be a beauty but it took two years of scrounging in junkyards to fit everything together, and the instruction manual furnished didn't help much either. Fiberfab still sells the basic Avenger GT-12 kit but now offers 13 accessory kits that contain everything you need short of the VW engine and running gear. You can buy the complete package or order the accessory kits separately as time and your pocketbook allow. They state that "detailed installation instructions" are packed with each individual accessory kit. For more information and a color brochure on all Fiberfab products send \$2 to Fiberfab, 2365 Lafayette St., Santa Clara, Calif. 95050.

ROLL BAR PADDING KIT:

Autopower Corp., the nation's largest producer of bolt-in roll bars, is now marketing a NASCAR-approved roll bar padding kit. The padding material is an exclusive closed cell plastic composition and the tubing is pre-slit for easy installation. Color pigments can be added to the paint provided so that the finished padding will match or contrast with the car colors. Both the paint and



the padding are fire retardant. The padding material is available in 5/8- and 7/8-inch wall thicknesses for 1-3/4 or 2-inch roll bars. Prices range from \$19.50 to \$34.50, depending upon the thicknesses. For more information and a listing of over 60 bolt-in roll bars available, contact Autopower Corporation, 3163 Adams Ave., San Diego, Calif. 93116.



COMPLETE TUNE-UP KITS FOR IMPORTS:

Auto parts stores, chain and independent, are now featuring what are claimed to be the first complete tune-up kits ever offered directly to the owners of VW's, Volvos and Opels. The kits contain original equipment points and condensers along with the proper Robert Bosch spark plug for the application. The price is less than for the items bought separately from the car dealer. For additional information, write European Parts Div., General Wholesale Auto Supply, 1344 W. Altgeld St., Chicago, Ill. 60614.

READER'S

(Continued from Page 7)

reason to think that their valuation will go anywhere but up.

What's Better than a GT6?

Sirs: I would like to know if there are any cars which are more capable on the track in international competition than the Triumph GT-6+, regardless of the size of their engines? Does the GT-6 have a higher percentage of quality than all other cars and is it better designed and built than Mustangs, Camaros, Firebirds and Corvettes? I would appreciate this information very much as I would like to know the best car to buy regardless of cost — so I can say "I own the best road racing and rally car under the Ferrari." Thank you for this information.

*Shayne E. North
Merritt Island, Fla.*

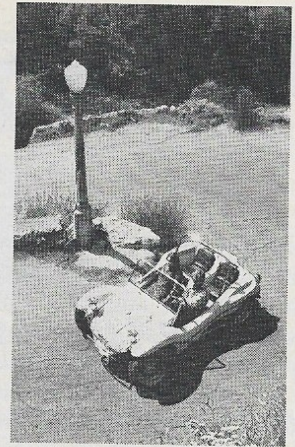
Don't thank us yet, Shayne, because it's impossible to answer your basic question intelligently and fairly. You're talking about apples and oranges plus a dozen other kinds of fruit. GT6's have compiled a reasonably good racing record right from the beginning, notably prototype wins in their class at LeMans and Sebring. So, too, have other cars both in this class and out. In SCCA events GT6's are raced in "C" production, pitting them against such more expensive cars as the Toyota 2000 GT, Porsche 911T, TR 250, Ford-powered Sunbeams and the like and with these only should the GT6 be compared. It sells for less (\$2995 in basic form) than most of its class competition and thus must be considered a bargain. We would not, however, want to compare quality with, say, a Porsche. Also, most experienced drivers will agree that the GT-6 is tricky to take through a series of bends at speed. That won't bother a pro but it could prove damaging to at least the ego of an amateur. Really, no car is "best" except to the individual who bestows that superlative upon a specific make and model. Therefore, we can't fairly help you choose because personal opinions of this nature have no place in print.

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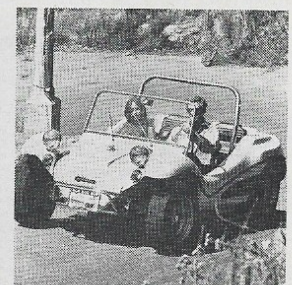
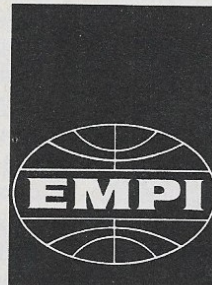
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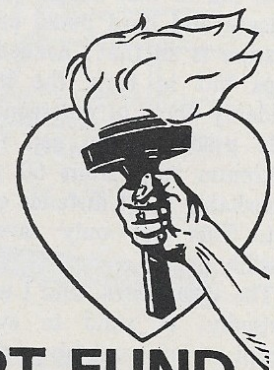
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VW SEDAN

(Continued from Page 15)

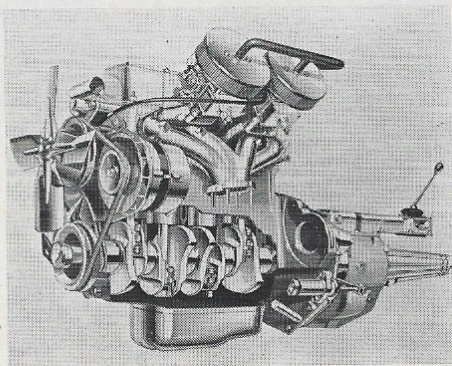
investigation to others. Let's just say that a beetle of any vintage driven sensibly is an eminently safe car, but those that aren't driven in this manner are from whence dune buggies stem.

It's also redundant to discuss standards of finish and other items of quality control. Only God can make a bug with fewer defects, and both He and Wolfsburg have had about the same amount of practice.

VW prices on all models have gone up about 2% to where the basic beetle now lists at \$1924 exclusive of local taxes, freight and handling. Another hike is at least being discussed due to current fluctuation of the *Deutschmark*.

SUNBEAM

(Continued from Page 19)



Neatly finished 1725-cc ohc four is fed by twin Strombergs. New features include alternator, hydraulic crankshaft dampener and ribbed oil pan (not shown).

The front disc brakes with standard servo fall in that happy range between delicate and hard pedal effort. Gentle pressure is all that's needed for normal stops but in turn, the brakes won't suddenly lock in emergencies. With a little practice, you can feather to a maximum stop from 60 mph in the remarkably short distance of about 135 feet. This not only saves tires but possibly lives.

The coachwork, and I use that term advisedly, is solid in every respect except, unfortunately, the actually unimportant matter of how the doors sound when they are closed. You might

Nevertheless, it represents a bargain because you've not being charged for the new electronic diagnostic centers now being operated by all VW dealerships. A no-charge trip through these is a part of each warranty inspection and, of course, the facilities are available to owners of older cars.

As a final note, I should point out that while the new 1600 engine peaks at higher rpms, this fact is not reflected in those little red marks on the speedometer that tell you when to shift. Theoretically it tells you to eschew 3rd for high at 55 mph, but our zero to 60 mph times were achieved by staying in 3rd and during the 50 to 70 exercise, the engine was completely happy in 3rd at 65. This information is proffered merely as our experience and not as a recommendation. Even though the speedometer is a carryover, you're technically abusing the car by exceeding the red marks in gear. •

call the noise a "clung" instead of either a clunk or a clang. Other than this, construction and trim are of an order you won't find on any French or American car. You might compare it perhaps with Mercedes except that it's not laid on with a heavy hand. All veneer is genuine wood, gauges and switches are British traditional except for the square, poorly located clock and there's even a light for what the British like to call the cubby box. My only minor complaint involves the mirror which can't be tipped for night usage without smearing the glass and knocking it out of kilter.

The flow-through ventilation could not be simpler. Diffusers are located at either end of the panel and a single knob on each can be pushed or pulled to aim the air and then turned to regulate quantity. Again a detail, but much the same thoughtfulness is found in the courtesy light. You turn the lens and not a separate switch for it to stay off, on, or operate with the doors. The same simplicity is not true, though, of the three-point belt system provided. In 10 days of living with the car, I was never able to get the straps sorted out so that the shoulder part wouldn't all but lynch me in a sudden stop. Passengers tried theirs too, gave up after a few minutes and then couldn't get it folded up and stowed.

As mentioned, the seats are chair-height and therefore comfortable for long runs. Pedals are large and well spaced, and the short throw gear lever was of a smoothness normally associated only with ZF. The wheel position

is such to encourage the proper 10 minutes to two placement of the hands.

In summary, the Alpine GT is not only a bargain at \$2500 but it's a car that's interesting enough to be coveted by those who require more than just transportation. Performance-wise, it will hold its own with at least a 912 Porsche and use only 26.4 miles to the gallon in the process. •

JAGUAR

(Continued from Page 33)

body shell. That car, and the V-8 engine series, now becomes extinct.

Instead for 1970 there's a new Daimler Sovereign, which is the 246-hp Jaguar XJ6 disguised and given a bit more luxury for about 15% more money. So far as Jaguar engineers were concerned, the V-8 Daimler engines suffered from a most unfavourable N.I.H. factor (in engineering parlance, N.I.H. means "not invented here"), and so were doomed.

Yet dolling up the Jaguar XJ6 as a Daimler Sovereign has been very well done indeed. The car really does look that little bit better inside and out. It's most unlikely to be exported to U.S., but it meets all the federal requirements just as does the Jaguar. Anyone taking delivery of a car in Europe for a holiday tour before having it shipped to America (still a good way to buy an import) might find it a fine bit of super-snobbery to specify a fluted radiator, and you'd still enjoy the convenience of Jaguar spares stocks for all save a very few parts.

Oh, yes, that magnificent 8-seat Daimler Limousine with the same all-independent suspension and Jaguar-designed 4.2-litre 6-cylinder engine as this new Sovereign is still being built, and there's nothing else in the world with as much room for passengers that has the same sort of race-bred handling.

Joe Lowrey



PORSCHE

(Continued from Page 34)

be driven at speeds ranging from 128 to 144 mph.

Two body styles are available, the familiar Coupe or the Targa convertible with its built-in roll bar and a detachable roof section that can be stored in the car when the airiness of a roadster is desired. Both cars have two rear bucket seats for youngsters, and for added baggage space, the rear seat back rests fold down to form a luggage platform to supplement the trunk at the front of the car.

All of the 911 Porsches are equipped with four-wheel independent suspensions and four-wheel disc brakes. The suspension and brake components are tailored to the engine output so that the handling of the car is matched with its performance.

A four-speed fully synchronized transmission is standard equipment but a five-speed manual unit and Porsche's Sportomatic clutchless four-speed transmission are offered as options. A full range of accessories is also available.

The 1970 911's are available now at Porsche Audi dealers throughout the country. Porsche Audi is a new franchise set up by the Porsche Audi Division of Volkswagen of America and by the 14 regional Porsche Audi distributors.

The 914 will be offered, come about Dec. 1st, with a choice of engines. These are either a 1679 cc (102.3 cubic inches) four-cylinder unit with electronic fuel injection developing 85 horsepower at 4900 rpm or a 1991 cc (121.5 cubic inches) six-cylinder powerplant turning out 125 horsepower at 5800 rpm. Top speed of the four-cylinder version is about 110 mph, while the six has a top speed of over 125 mph.

Thanks to its mid-engine design, the Porsche 914 has trunks in the front and the rear of the car. The rear trunk, in addition to carrying baggage, is also used to store the fiberglass roof section when the openness of a convertible is desired. The 914, priced at just under \$3,500, is expected to appeal especially to drivers who may not have been able to afford a Porsche before. For those demanding maximum performance, the 914/6 is priced at under \$6,000.

The Audi line-up will include two basic models, the Super 90 and the more luxurious 100 LS (see page 20). Both models are equipped with front-

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wheel drive so that the front wheels not only steer the car but also pull it around corners. The Audi Super 90 will be offered in two- and four-door sedan versions as well as a two-door station wagon. The 100 LS will be available with two- or four-door bodies. Prices will range from about \$2,800 to about \$3,600.

Audi, a newcomer to the U.S. auto

market, rates as one of the world's oldest makes, having been built in Europe since 1909. It is produced by a subsidiary of Volkswagen in Ingolstadt, Germany. Porsche, one of the last family-owned automobile companies in the world, is located in Stuttgart, Germany. It was founded by Ferdinand Porsche, the automotive engineer who designed the Volkswagen in the early 1930's. ●

OFF THE RECORD

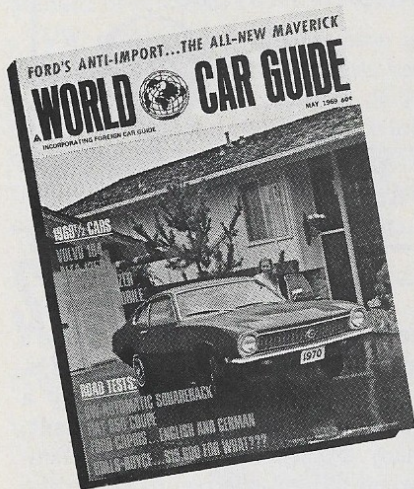
By Ed Reed



"Look what you did to my car, you big lame-brained slob."

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GRAND PRIX

(Continued from Page 39)

they came around after the first lap, as almost the full pack of Gold Leaf Lotus cars were in the first five. The order was Rindt/Stewart/Hill/Siffert and then Beltoise in the second Matra. Andretti's red and white Lotus had looked great burning rubber off the line with all four wheels, but he almost lost it at the top of the hill. He may well have been bumped by Eaton in the BRM when he bobbled, but the 4wd Lotus was a flop anyway. (Ed. Note: Temporarily, we're sure. See page 40 for details of this superb new machine.)

The race for the first 35 laps was nearly all Rindt and Stewart, with the Austrian showing the new World Champion the way around for the first eleven of them. Then Stewart took over for nine. When Rindt went back in front again on the 21st lap, the rapid pair had more than 15 seconds on the rest of the field, and a real bash was going on back there for 3rd, 4th and 5th positions.

Ickx, Courage, Brabham, Surtees and Hill were all within one second of each other. They started lapping the tail-enders, the Rodriguez Ferrari in particular after a pit stop to change tires, and through the traffic Courage pushed his Brabham in front of Ickx.

Up front, Stewart's Matra was showing the strain of the pace and started smoking after developing an oil leak on about the 30th lap, then took to the pits on the 35th circuit never to return. This left Rindt with a clear lead of more than half a minute over the battle for second spot. Ickx's Brabham had fallen behind Jack Brabham's Brabham, suffering from heating and low oil pressure. It finally left him stranded on the course at 78 laps when it blew. Meanwhile, Brabham himself was giving the 27-year-old Courage a taste of nose-to-tail, actually touching his protoge coming in and going out of the pit turn.

The only accident of the race started its chain of events on Lap 90 when 1968 World Champion Graham Hill spun his Lotus in the fast loop, or Turn 7, at the end of the long straight. The excursion was apparently caused by a tire losing air. Hill took a look, climbed back in and came around, signaling the pit to get a tire ready.

He never made it as this time he really lost it in Turn 7, up against the outside bank. The car hit backwards, got airborne and started to flip. Hill had



U.S. Grand Prix M.C., sometimes racer/TV actor Dickie Smothers, talks with a pit steward in his best CBS-be-damned manner.

neglected to fasten his seat belt again, and came half out of the Lotus when it went over, breaking his right leg in three places and dislocating his left knee. Observers claim Hill's injuries may have been worse had he been strapped in the car, as the part of the flipping vehicle taking the worst punishment was the area where Hill would have been had he not come part way out.

Regardless, this really put a damper on the race and left only seven cars on the course to finish the parade, with only Courage's Brabham on the same lap as leader Rindt's Lotus at the end.

The checkered flag fell on Rindt at 108 laps and he crossed the line for the 248.4 miles in 1 hour 57.56 minutes for an average speed of 126.36 mph, a new record. Behind Rindt in 2nd place was Piers Courage in the Frank Williams Brabham-Ford, who garnered \$20,000 and the "Man of the Race" award for his constant pressure on the leader and consistent performance under constant pressure behind from Jack Brabham. John Surtees brought the BRM home 3rd when Brabham was forced to pit for fuel late in the race, dropping him to 4th.

Rodriguez brought the NART Ferrari in five more laps back in 5th and Silvio Moser finished a third Brabham-Ford 6th with 98 laps completed. Johnny Servoz-Gavin gave the 4wd Matra-Ford its first complete Grand Prix run, being 7th and the final finisher with 92 laps completed. All others were DNF.

If there was an unsung hero of the race, it had to be the old master, three-time World Driving Champion Jack Brabham. A point that shouldn't go unmentioned is the fact three of the seven finishing cars were Brabham-Fords. For nearly three-fourths of the race, Brabham had pushed Piers Courage to one of the best grand prix drives of his career, yet had the cool not to extend Courage or himself beyond their limits. The unflashy but studied performance of the BRG Brabham cars was admirable.

COLIN CHAPMAN

(Continued from Page 41)

restricted, and there is no cramping by the wheel rim to limit caliper rigidity. No flexible hoses are needed, further "hardening" brake feel and so permitting more favourable leverage. Mounting of the internally ventilated discs as sprung weight means that they can have as much heat storage capacity as is needed without impairing road holding.

Colin Chapman does not consider the elaborate limited-slip central torque-splitting differential of the Ferguson system necessary for racing. Between the front and rear drives, though, Chapman does use a torque-splitting differential, about the details of which he is secretive. My own guess would be that his secret is the lack of any secret device at all here! Different sets of gears can vary the ratio in which torque is shared between front and rear axles, so that turning on power when cornering hard produces either the response of a front- or a rear-drive car. Any appreciable self-locking effect in the central differential might make the handling of a Grand Prix car dangerously inconsistent, would it not?

Anyway, under the back of the driver's reclining seat there is a gearbox with its oil cooler, and transfer gears taking power to the torque-splitting differential at the left side of the car. Torsionally flexible quill shafts of only 19-mm (0.748-inch) diameter, enclosed in tubes with steady bearings, transmit power forward and aft to the "axles." Flexibility here cushions the drive but not the brakes which work separately on each wheel, without, if my deductions about the central differential are right, any Ferguson-style transfer of braking from one end of the car to the other.

Structurally the Lotus 63 looks like a sensible compromise. A strong monocoque hull encloses the driver, the

power unit and the fuel bags which enjoy good protection from crash damage, but welded steel multi-tubular sub-frames at front and rear carry all the suspension and steering mounting points. Besides helping to spread stresses into the 18-gauge aluminium monocoque, the sub-frames will simplify re-design of details as lessons are learned about a radically new car.

Presumably to avoid concentrated torque reaction stresses on the monocoque hull, there are half-width "axles" at front and rear, hull-mounted and held against rotation by what are virtually Watt linkages. Brakes mount on the ends of these "axles," outboard of which tubular shafts with constant-velocity universal joints drive the wheels. When the driver has his feet on the pedals, the front "axle" (with its differential offset to the extreme left) is just above his ankles.

Typical of the cunning which has gone into this car is the scheming to ensure that the last drop of fuel will flow out of its five flexible tanks regardless of acceleration, braking and cornering sloshing the fuel about. It is reckoned that many other racing cars start misfiring when 20 pounds of fuel remains in the tanks, so they must carry that weight of excess fuel.

At 98-inch wheelbase by 59-inch track, 169-inch length by 75-inch width and 34-inch height, this car is rather above the F1 minimum weight of 1100 pounds. So have been the rear-driven Lotus F1 cars. It seems pretty certain that, once it has been sorted out on the circuits and the drivers have learned how to handle it, the Lotus 63 will prove itself as the car which other people must try to copy. So, after a year wasted on the irrelevancy of aerofoils, we have a real advance in high-performance car design.

What's more, Lotus have just reported a highly profitable year's trading as a public company. So, accountant Fred Bushell must have run the shop pretty well while Colin Chapman was back where he's irreplaceable — back at the old drawing board! ●



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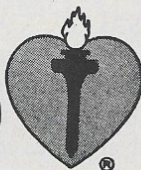
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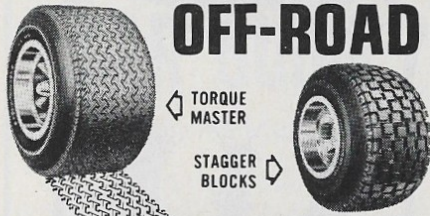
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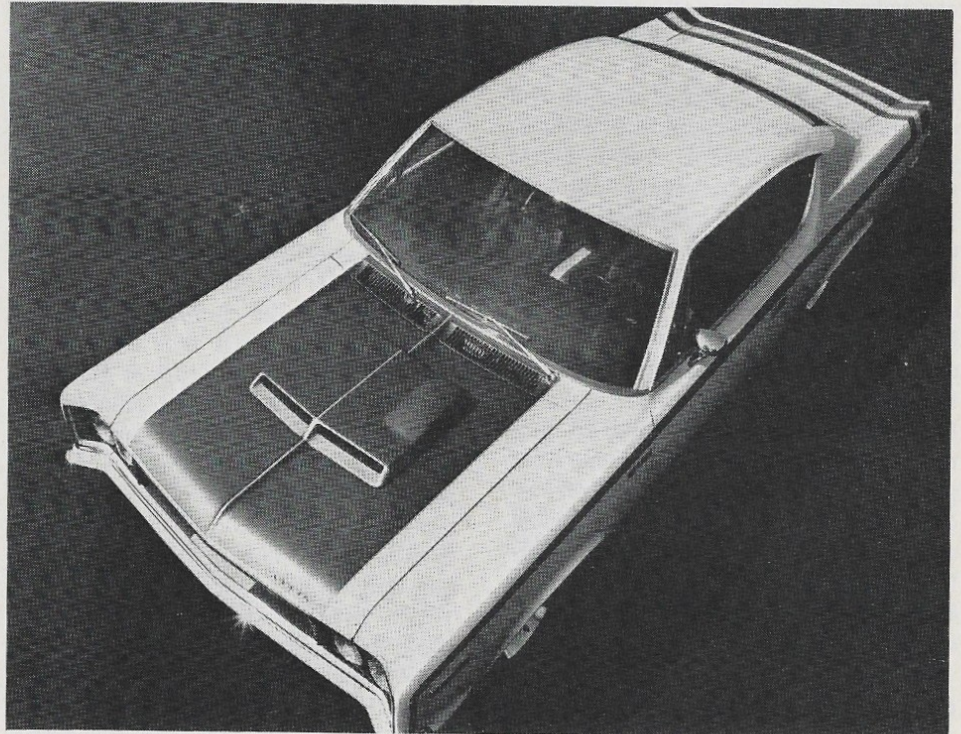
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WORLD NEWS

(Continued from Page 10)

another note Ralph T. Millet, president of SAAB USA, has spoken out strongly for the immediate appointment of a U.S. ambassador to Sweden. He is keenly aware of the danger that the currently strained relations between the two countries could (but hasn't yet)

affect SAAB's growth rate here. He was hard put, though, explaining Sweden's recently announced \$40 million aid program to North Vietnam. The fact that one-third is earmarked for medical supplies and the rest is not a loan but a credit to be made available for reconstruction work *after* hostilities cease is not of much solace to returning GI's or the parents of those now there. It's all very laudable — depending upon whose side you're on.



Far cry from a Jeep is AMC's new high-performance model called the "Rebel Machine." Tachometer on the hood and 340-hp are featured.

AMC-JEEP MERGER . . . The wedding of these two firms was in no sense performed under the aegis of a shotgun as both have been solidly in the black for some time. It also has been in the discussion (and rumor) stage for at least four years — being discussed, in fact, so long that the rumors died out and the actual event caught most observers by

surprise. Kaiser Jeep will add 1636 dealers to American Motors' total of 2351 and the lines, of course, are non-competitive. About 200 Jeep dealers are already dualed with AMC. Nor is this really a buy-out one way or the other, as the AMC stock committed in the purchase gives Jeep's parent, Kaiser Industries, effective control of AMC.

ONTARIO SPEEDWAY LAUNCHES TICKET SALES . . .

Although Big "O" won't officially open until the California 500 race for Indy-type cars on Sunday, September 6, 1971, tickets are already being sold at prices ranging from \$8 to \$25, figures somewhat under what is charged by the Indianapolis Speedway. The \$25.5 million facility 40 miles east

of Los Angeles City Hall is rapidly taking shape and when finished, will seat 140,000 spectators — 85,000 in permanent grandstands and 55,000 in portable bleachers. An untold additional number can park in the infield. Reserved seat customers will have an unobstructed view of the entire 3.23-mile course.

VWCA NEWSLETTER

(Continued from Page 52)

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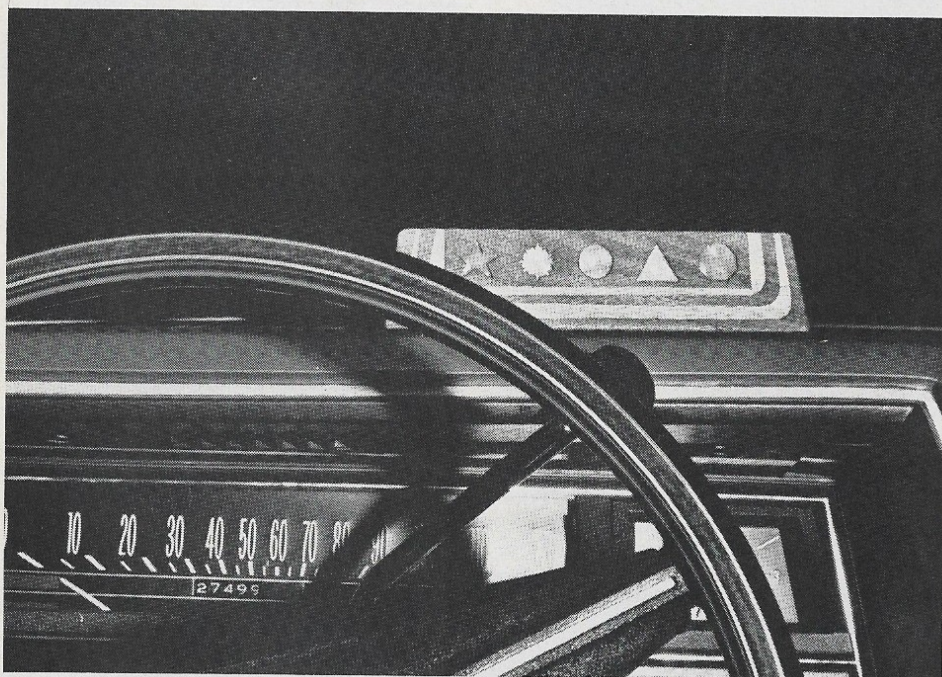
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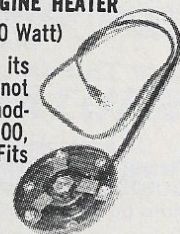
vehicles, the left being for ambulances and the like and the right for school buses. The other two are yellow lights, one steady to signal an accident ahead and the other flashing to indicate a broken down or slow moving vehicle. No costs for the conversion are quoted but it would undoubtedly be cheaper than some of the systems involving roadside broadcasting stations already proposed. So far it's just an invention but the sponsors feel that if enough of

(Continued on Page 62)

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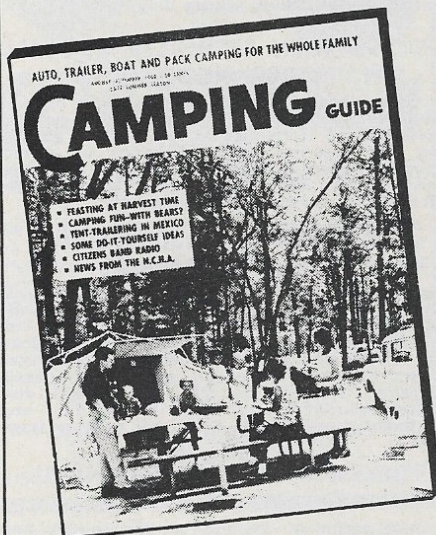
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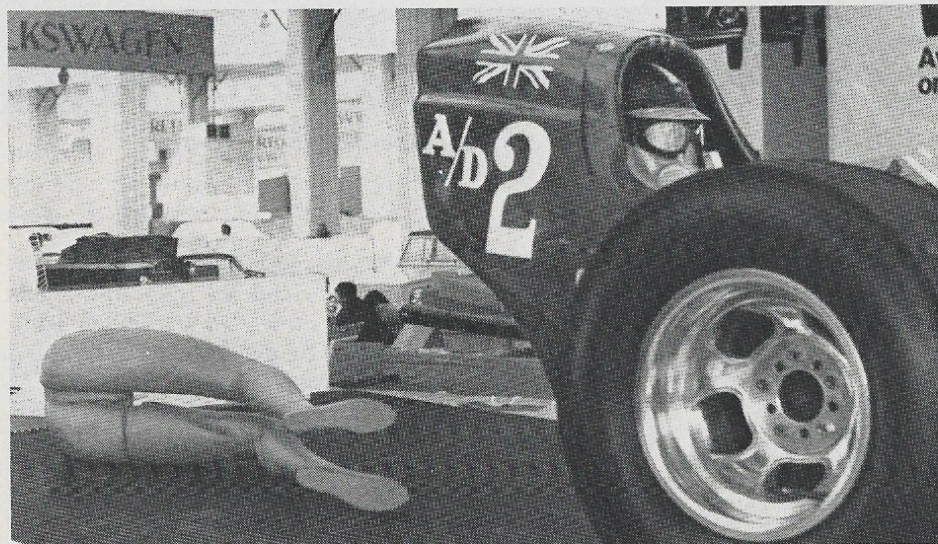
(Continued from Page 61)

us campaign for its adoption, that the device could be required under the safety laws by 1972. They don't suggest arbitrary retrofit. The firm is anxious to build a dossier to show the need, so if you have had an accident or a near accident caused by a sudden road hazard, write them about it at 132 South 13th West, Salt Lake City, Utah 84104. Just your opinion is also welcome.

BLMC OPTIMISTIC... As its first full year of operations on these shores draws to a close, British Leyland Motors Inc. expressed optimism for the future. Spearheaded by the popular, \$1899 Austin America sales were up 18% for a total of 68,096 units and they might have been even higher if the Jaguar XJ6 had existed in some form other than a picture in press releases. Company president Graham Whitehead isn't disturbed about the forthcoming Detroit-built mini-cars. Says he: "The very real probability exists that if the new small cars are going to hurt anybody, it will be Detroit's own big car lines." British Leyland Motors Inc. went into operation here a year ago shortly after its parent company, British Leyland Motor Corporation Ltd., was formed in England through the merger of Leyland Motors and British Motor Holdings. The U.S. firm accounts for about 70% of all British car sales in this country, currently marketing MG's, Triumphs, Austins, Rovers and Jaguars.

PILOT TRAFFIC FLOW PROJECT... If you live in Cincinnati, Indianapolis, Kansas City, Miami, San Antonio or Seattle you'll be glad to know that the Bureau of Public Roads is funding a pilot program to speed traffic flow on downtown street grids that contain 100 or more traffic signals. The idea is to synchronize the lights according to computer determination of the most efficient flow. It would eliminate the familiar situation where arterial flow is arbitrarily stopped at each cross street on the hoary premise that it "slows people down." In other actions the government has extracted stiff fines from both General and Mohawk on the grounds that certain tires made by these firms failed to meet standards set by the National Traffic and Motor Vehicle Safety Act. Less than 100,000 tires in all were involved and the companies paid the fines without admitting any guilt thereby. Both, of course, have recalled the offending products. In a happier move, B.F. Goodrich has been selected as a supplier of the radial tires that are standard equipment on the 1970 Thunderbirds. Michelin, if you'll remember, got the contract for the Mark III. Adoption of these tires of any brand as standard equipment on U.S.-built cars is better late than never.

FORD TURBINE IN A BUS... If you patronize Continental Trailways' "Silver Eagle" service out of Dallas, you may get a ride in a prototype powered by Ford's 707 turbine. That's certainly combining the talents of two continents for these magnificent buses are built to Trailways' design in Belgium. Like any bus, though, conventional diesel power



This is the type of thing you see when you attend an auto show preview. They're never ready on time.

makes passengers in the rear feel like they've spent hours riding in an agitator. The turbine should practically eliminate this uncomfortable vibration. Unlike Chrysler, Ford has always believed that the first commercial over-the-road market for turbines will be in trucks and buses and a number of turbine-powered trucks are already being tested in fleet service. Ford is targeting 1972 as the year of commercial availability.



Wolfsburg recently played host to Brazilian Minister of Foreign Affairs Jose Pinto (front left). Driving him in a Cushman cart is VW president Kurt Lotz.

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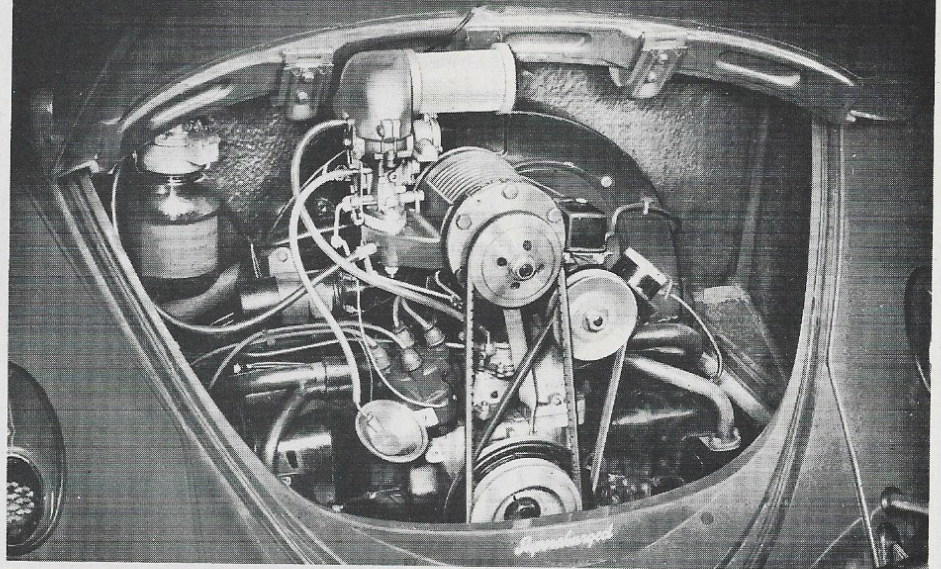
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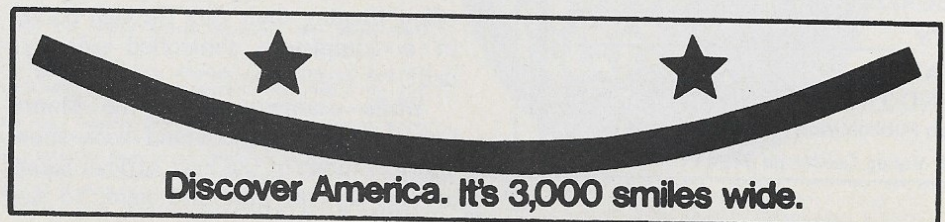


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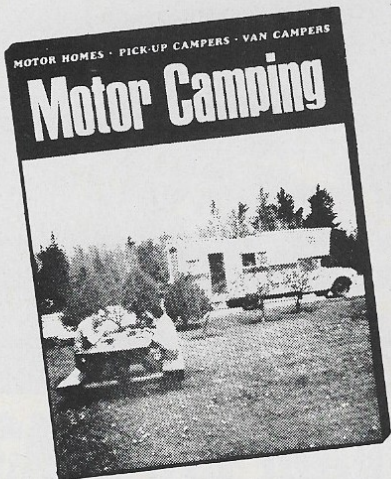


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ROAD RALLY

(Continued from Page 43)



Simo Lampinen, a native of Finland, overcame polio to become one of SAAB's top drivers. Off season, he helps his father run the family ski factory.

work their way along the snow-covered roads in the French Alps to rendezvous at the tiny principality of Monaco. Conditions can be extremely severe. The 35th Monte Carlo Rally, in 1966, began with the continent buried in snow and temperatures several degrees below freezing were common along all routes.

After a night's rest at Monte Carlo, the drivers and navigators begin a very hectic 800 to 900 mile run through the tricky mountain passes to Chambéry and back, with special speed stages thrown in. And, very often, it is the all-out speed in these special stages that determines the winner. The first run is followed by a second mountain test for the top 60 cars remaining, with more special stages over closed roads. It is on these narrow, frozen roads that the Scandinavians really show their stuff, often flinging their cars through curves in a completely controlled sideways drift.

While competitors in the Monte Carlo Rally must contend with snow and ice, those in the East African Safari are faced with dust and mud, to say

nothing of wild animals. Elephants lumber across the road and an angry rhino may actually charge one of the cars. Erik Carlsson once wiped out his car by crashing into an anteater at 100 mph. The natives get into the act, too. Many villagers think it great sport to throw rocks at windshields and even go so far as to block the road with logs.

This, the world's most punishing event, is run on Easter weekend over some 3000 miles of abominable roads in a figure-8 route starting and ending at Nairobi. Temperatures range from the intense heat of the equatorial coast to the penetrating cold near the top of Mount Kilimanjaro. Every year the Safari gets bigger and more prestigious in the spotlight of world publicity, but it is usually won by a local driver who is well acquainted with its treacherous conditions. As an example, in 1968 only 7 out of a field of 91 cars survived the rally.

The weather is always a gamble. Imagine trying to overtake a car in front that is throwing up blinding clouds of dust or finding yourself up to the

fenders in thick, black, oozing mud. Either is possible, because all it takes is a rain storm to change the dry, solid roadbed into a quagmire. So, whatever the Safari provides, with three days of average speeds well up in the sixties, it's no game for the beginner.

Considering the conditions, it's no wonder much careful planning and preparation is involved in getting a rally car ready. The cost of an all-out factory effort in the Monte Carlo Rally, for instance, can add up to as much as \$140,000. In 1968, it was rumored that Lancia wrote off as many as eleven cars in a month of pre-rally training over the mountain sections. They then prepared an additional nine vehicles to take part in the event itself.

The first step in preparing a car for competition is to get rid of all excess weight. Then you rebuild it from the ground up, reinforcing all areas that require additional protection. Brake lines are re-routed or covered with protective armor and the engine oil pan and gas tank must also be shielded to prevent damage. The steel plating used not only fends off rocks and other road hazards, but also serves to distribute the force of a possible collision over a greater area.

For the 1968 RAC Rally, SAAB

took four cars off the assembly line and the mechanics custom-tailored them to suit the individual factory drivers. Standard engines and transmissions were removed and specially geared transmissions were delivered from the factory. Engines came from the competition department's own engine shop. While the RAC Rally doesn't require excess power, it does call for elasticity and durability. The rough British roads require stiffer springs and shocks, too.

While engine modifications are tested on the dynamometer, drivers and navigators are out reconnoitering the course. Each speed stage is run over and over until every curve, bend, brow or problem is noted in the navigator's rally notes. These notes are sometimes all that will guide a driver on treacherous forest roads in the English night.

Choice of tires is a major part of rally planning and at least three complete changes is normal for an RAC event. In rallies that don't allow service crews, spare sets of mud and snow treads, with studs or chains and already mounted on rims, are carried in the trunk, back seat or on the roof. Dunlop SP-44 Weather-masters, somewhat larger than regular SAAB tires, were fitted to allow higher ground clearance and to protect the rims. Racing tires were also required for

the speed stages on race tracks. Team managers say that success or failure depends to a great extent on forecasting the weather and making the correct choice of tires for the conditions expected.

To win an international rally under the extremely difficult conditions involved, you need three things: a top driver, a rugged car that handles well and a strong team organization. Of the three, the car is probably most important. They say that competition improves the breed and this is certainly to the benefit of prospective buyers of the imported cars that test themselves in rally competition. Rallies make an ideal proving ground and it's through trials like this that the average motorist is assured of a stronger, safer car. ●

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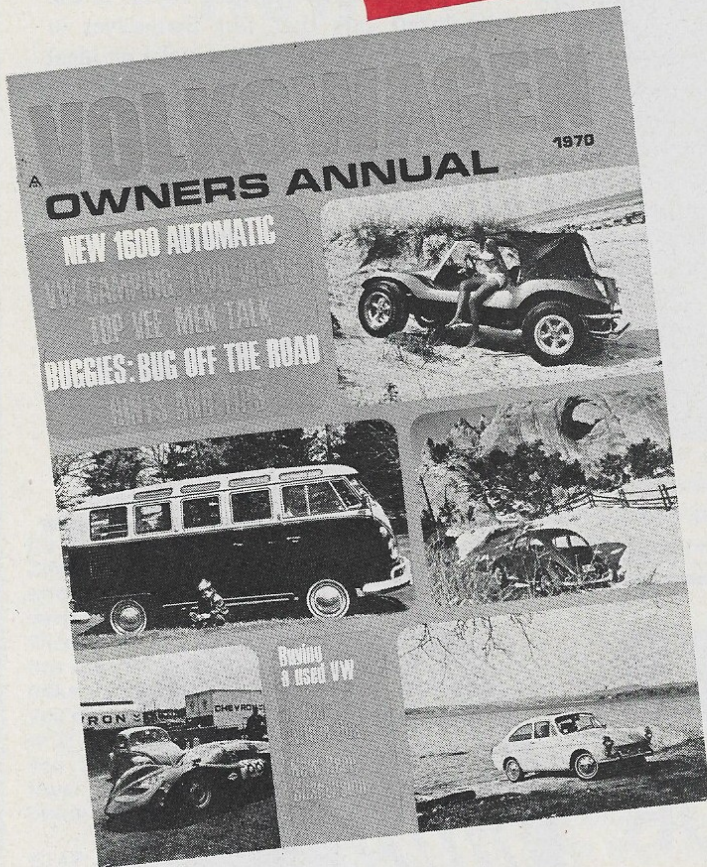
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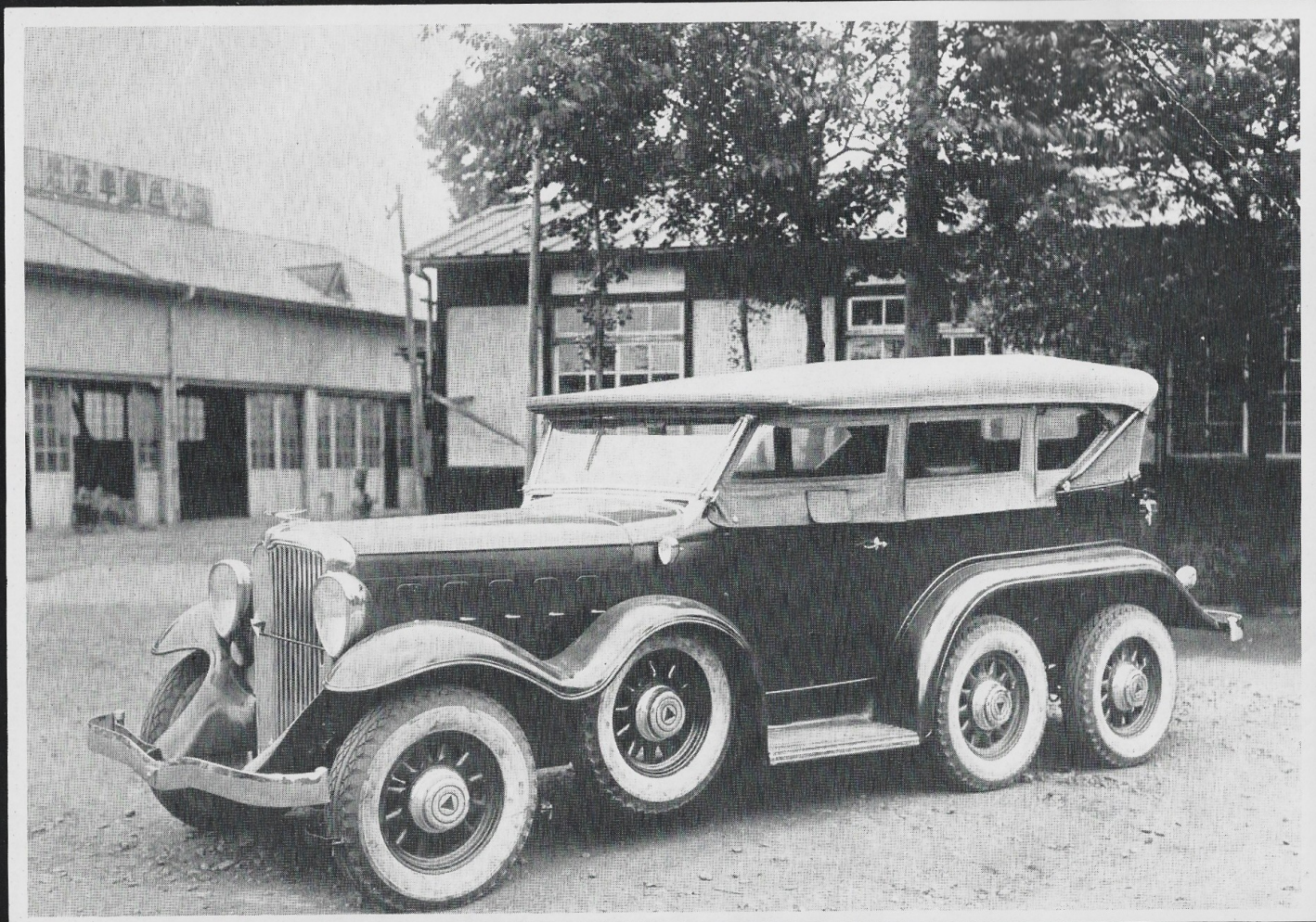
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1204 is 3.3 inches shorter overall than the Beetle, but the Simca's 99.2 inch wheelbase is 4.7 inches longer. The Simca is only 1.5 inches wider on the outside but far wider on the inside than the Beetle."

Car and Driver, June 1969

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Car and Driver, June 1969

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Car and Driver, June 1969

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Car and Driver, June 1969

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Motor Trend, July 1969

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