

TREND BOOK NO. 104

# Speed *and* Sport

BY THE EDITORS OF *Auto* MAGAZINE

160 PAGES! 75¢

OUTSTANDING SPORTS CARS

HOW TO DRIVE A SPORTS CAR

COMPETITION TUNING



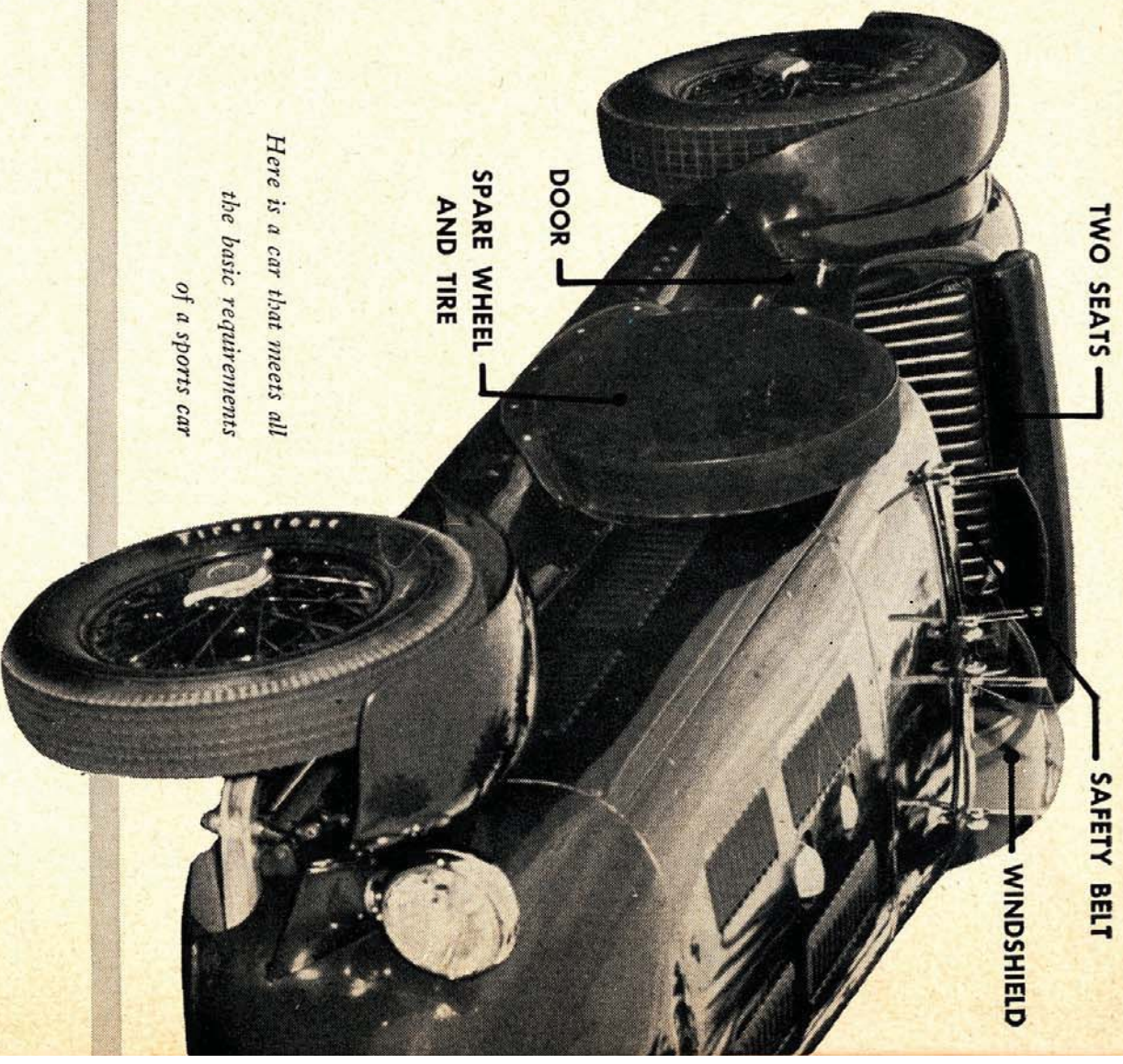
VON NEUMANN COMPETITION MG-TD

## THE SPORTS CAR STORY — BY JOHN BENTLEY



BILL SPEAR'S TWO-LITRE FERRARI





*Here is a car that meets all  
the basic requirements  
of a sports car*

**T**HE TICKLISH question: "What constitutes a sports car?" has been under debate, if not since J. Frank Duryea won the first American road race from Chicago to Evanston and back in 1895, at least since the advent of the beautiful little "Alfonso" Hispano Suiza of 1912 which marked the rift between the pure racing car and the touring automobile and the beginning of another phase in motoring. It was at about this time, too, that the term "sports car" first was coined in England to describe a new and versatile breed, capable of fulfilling in large measure the jobs of both its predecessors—the tourer and the type of machine whose sole purpose was to compete in races.

Today, some 40 years later, a clear-cut

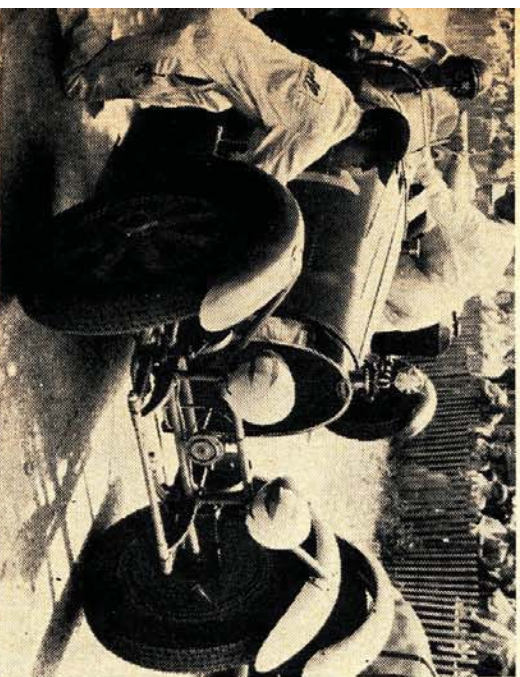
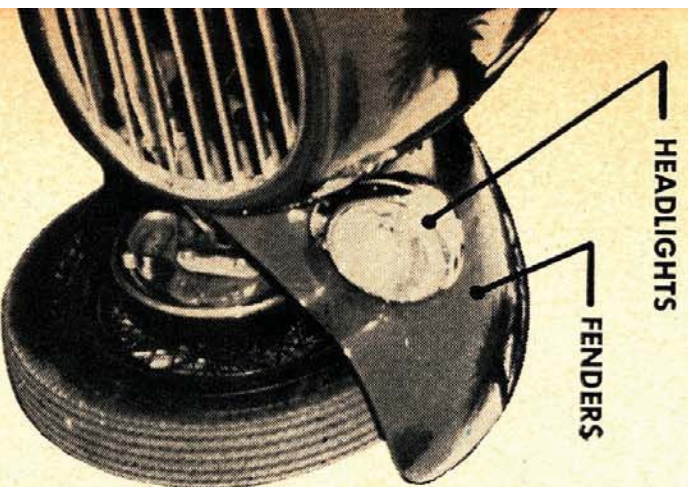
definition of what makes up a sports car has still to be drafted and this provocative riddle is not much nearer solution. The chances are that it never will be, for the simple reason that changes in component design bring about endless new interpretations by enthusiasts as to their uses and limitations, and no two fans seem able to agree.

Let's take suspension as an example. Ten to 15 years ago, it was an accepted thing that any self-respecting, thoroughbred sports machine had to ride like a coal cart. To provide what was considered highly desirable "lateral stability," springs had to be stiff and hard, with no "give" at all and practically no up-and-down wheel movement. To achieve this, the already hard springs were further stiff-



**Do you REALLY know  
what makes a sports  
car? If you do, you're  
one of a select few**

*by John Bentley*



DICK THIERRY

*The sports machine of 15 years ago rode like a coal cart. Springs on this Type 54 Bugatti were stiff and hard, to provide what was considered to be highly desirable "lateral stability."*



tened by enormous friction type shock absorbers that practically locked everything solid, so that every bump, ripple or seam on the highway was transmitted to the driving seat. Rugged enthusiasts who handled these machines laughed scornfully at the notion that maybe a sports car might be made to offer a comfortable ride. Comfort had no place in a sports car, they claimed, and was not to be expected by any but a sissy, who had no business driving that type of machine anyway. Performance was the only thing that counted, even when riding over cobblestones in a blizzard. In justification, the sports car fraternity coined the beautiful term "classical ride," which sounded a lot more appealing than "coal cart ride," although it meant exactly the same thing. If the "classical ride" (preserved with stubborn gallantry in such cars as the MG and HRG until recently) brought you no joy, you simply couldn't own a sports car and you had to be content with a family sedan.

Yet today, practically every sports car in the world has independent front suspension; many have independent suspension on all four wheels, and in America's first true sports car since the Cord—the Cunningham—provision is made for *nine inches* of up and down wheel movement in the pursuit of



*The MG-TD has coil springs and wishbone arms, providing independent front suspension. Today, practically every sports car in the world has independent suspension, many on all four wheels*



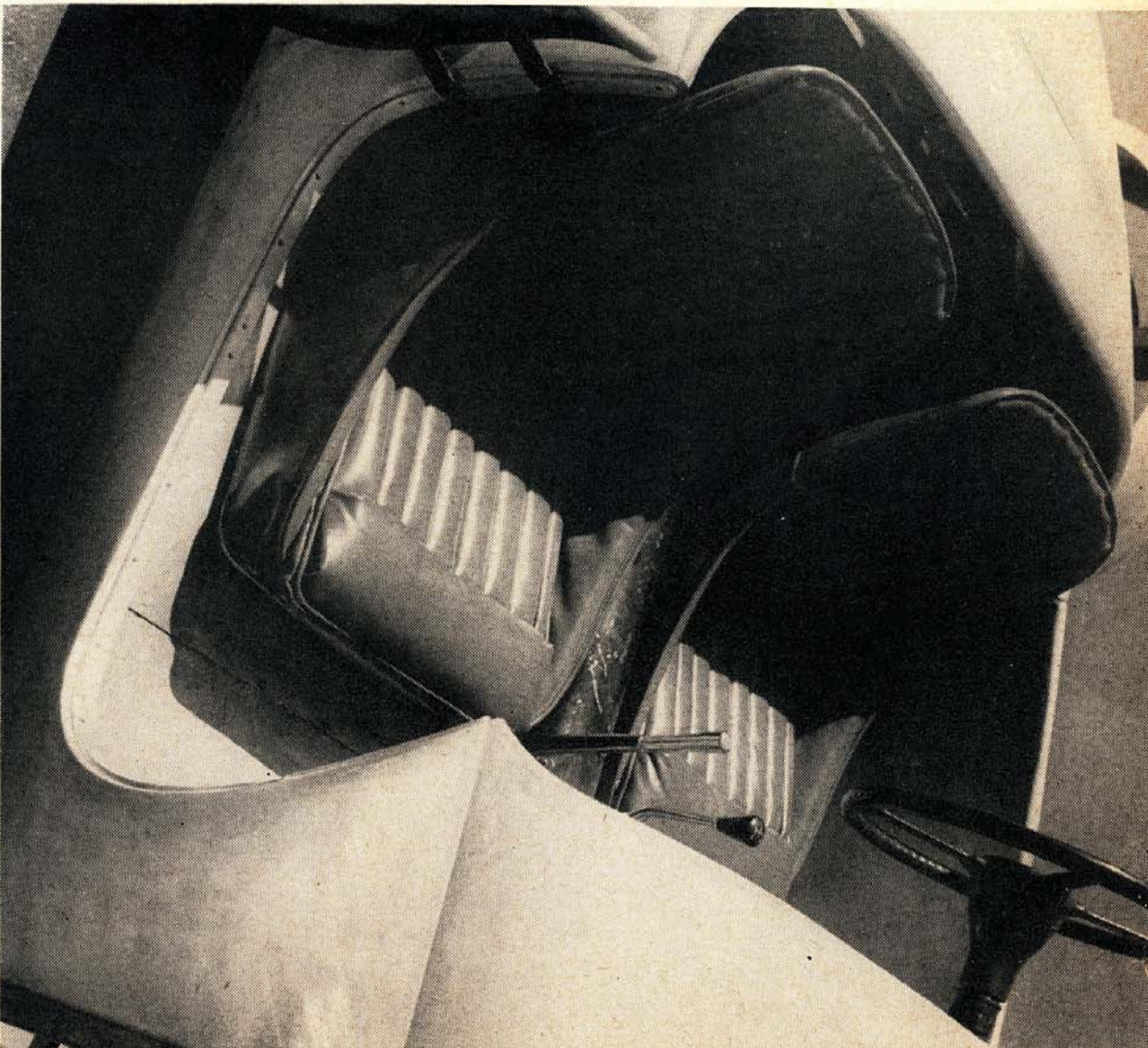
*The front suspension on this MG-TC incorporates parallel springs and a rigid axle*

real comfort. Yet the Cunningham is a road holder with the best of them and has now proved it to the hilt.

The "crash" type gearbox was another feature that the true sports car enthusiast preferred with a jealous insistence, because a special kind of skill was required when shifting, so as to mesh up the straight-cut teeth of the whining transmission. If you didn't time your engine revs right on the nose when shifting down, brother, you not only didn't make it but neighbors could hear the clash of gear-teeth for several blocks down the road. The introduction of the synchromesh gearbox in sports cars brought howls of derision from the die-hard enthusiasts who regarded this innovation as "decadent" and designed to lower the standard of driving skill. They sniffed contemptuously for many years at the very idea, and some of them still do, even though the number of sports machines that still cling to the "crash" gearbox could be counted on the fingers of half a hand.

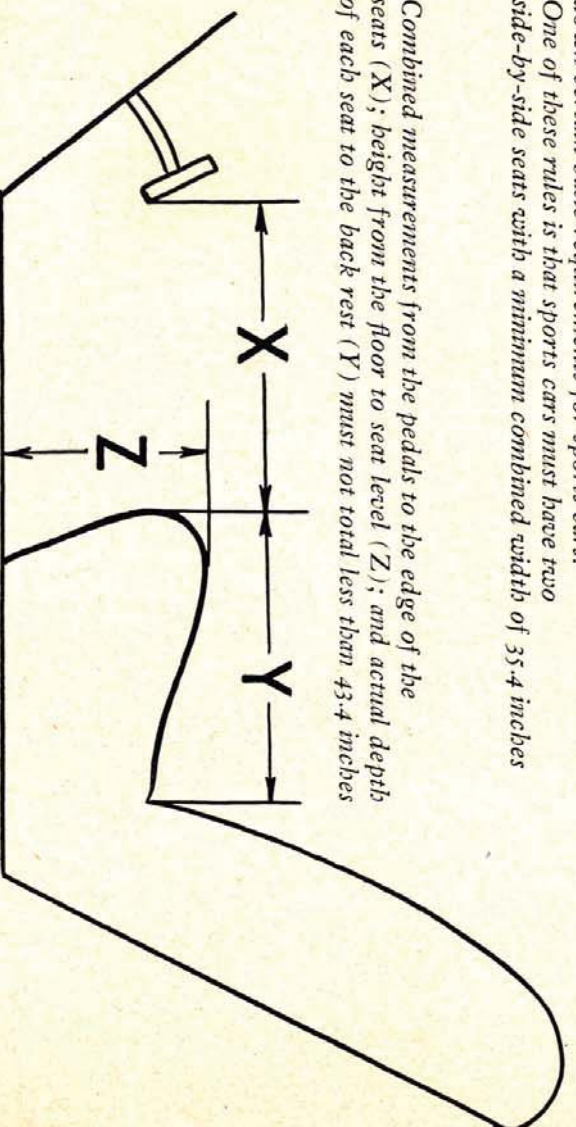
Just recently, the phenomenal improvement in sports car design during the period under review was brought home to me with dazzling clarity when I drove a restored thoroughbred 1936 eight-cylinder sports machine with twin overhead camshafts and a blower, and immediately followed this run by handling a 1951 six-cylinder twin overhead cam unblown sports car. Maybe you've guessed it. The first was the famous 2.3-liter





*The Federation Internationale de L'Automobile long ago laid down certain basic requirements for sports cars. One of these rules is that sports cars must have two side-by-side seats with a minimum combined width of 35.4 inches*

*Combined measurements from the pedals to the edge of the seats (X); height from the floor to seat level (Z); and actual depth of each seat to the back rest (Y) must not total less than 43.4 inches*





Monza Alfa Romeo and the second the Jaguar XK-120. The contrast was simply staggering. The Alfa, which cornered like a dream, stopped on a dime and had brutal acceleration far superior to many present-day sports cars, was a discordant orchestra of roars, howls, whines, shrieks and snarls that enlivened the "classical ride" which also featured a quaint assortment of shudders and tremors. Further to test driving "skill," the clutch was either in or out and if you dared try to slip it on take-off, you found yourself sitting on a minor earthquake that subsided only when the engine stalled. These forfeits were a pretty high price to pay, even for the peerless performance of the Alfa Romeo of yesteryear, yet at the time they were accepted as a necessary—even a stimulating—part of the picture.

By contrast, the XK-120 moved with the deathly hush of a jet-propelled ghost and was in every sense fully as tractable and docile as the Detroit hardware, but with a vital feeling of safety lacking in the former. There was not a whisper from the twin camshafts, the transmission or any other component, and had there been a supercharger, that would have been a lot quieter, too. Nor did the XK concede much in riding comfort to the plushiest family sedan with coil springs made of marshmallow, though where it lost out was in "payload" capacity.

Obviously, comparison between a Monza Alfa Romeo designed for the specific purpose of racing, and an XK-120 created for far more versatile use, is not the fairest that could be made, but it serves to bring out one important point which is the crux of the matter: the modern sports car has com-

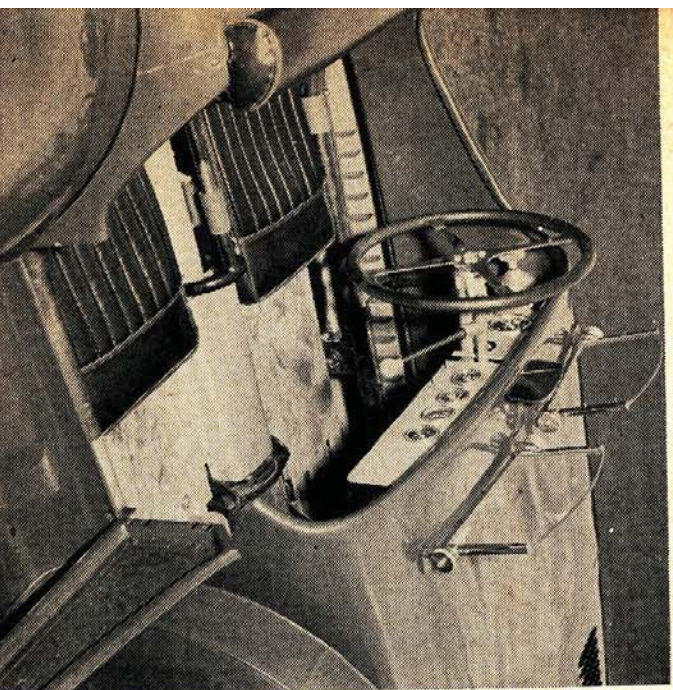
promised extensively with the family sedan and gone more than halfway along to meet it on common ground in terms of smoothness, docility, silence, comfort and easy handling, without sacrifice to the roadability, performance and endurance that are the hallmark of every true sports machine. This, however, still leaves us with the ticklish problem of where the one ends and the other begins.

The French FIA (Federation Internationale de L'Automobile) long ago laid down certain basic requirements in an attempt to define sports cars as distinct from race cars or touring chassis dressed up with sports car bodies (*ie.* what is sometimes known as the custom automobile), but these requirements have plenty of loopholes both ways.

Let's take a look at these rules, largely inspired by the famous French 24-Hour Endurance Grand Prix at Le Mans, now in its 14th year, and run ostensibly for sports cars as distinct from out-and-out race cars.

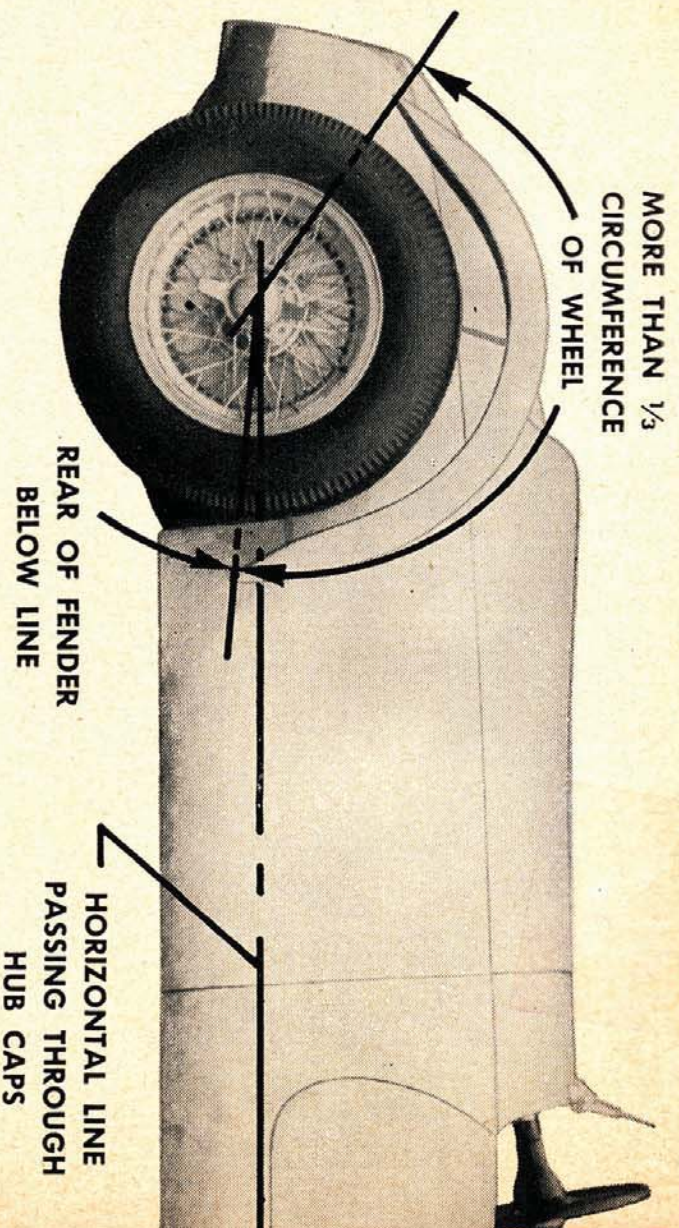
#### 1. BODYWORK:

- (a) Bodies must have two side-by-side seats that can actually be occupied and must be of a minimum combined width of 35.4 inches.
- (b) Combined measurements from the pedals to the edge of the seats; height from the floor to seat level; and actual depth of each seat to the back rest must not total less than 43.4 inches.
- (c) At least one solid door must be provided, equipped with proper fastenings and hinges and measuring a minimum of 15.7 x 7.9 inches.
- (d) Seat measurements must be computed on the assumption that each oc-



*The door on this Seifried Special meets the FIA basic requirements for sports cars. At least one solid door must be provided with minimum measurements of 15.7 x 7.9 inches*





cupant weighs not less than 132 pounds.

(e) Fenders must be provided for all four wheels and must be located exactly above each wheel with at least one third of the circumference effectively surrounded. The rear extremities of front and rear fenders must not be higher from the ground than a horizontal line passing through the center of the hubcap.

(f) When supplementary regulations require that a top be carried (in the case of an open car), a windshield is compulsory and must measure not less than 27.5 x 7.9 inches, though it may

be lowered at the driver's discretion.

(g) In the case of closed cars or convertibles, such windshield is also compulsory.

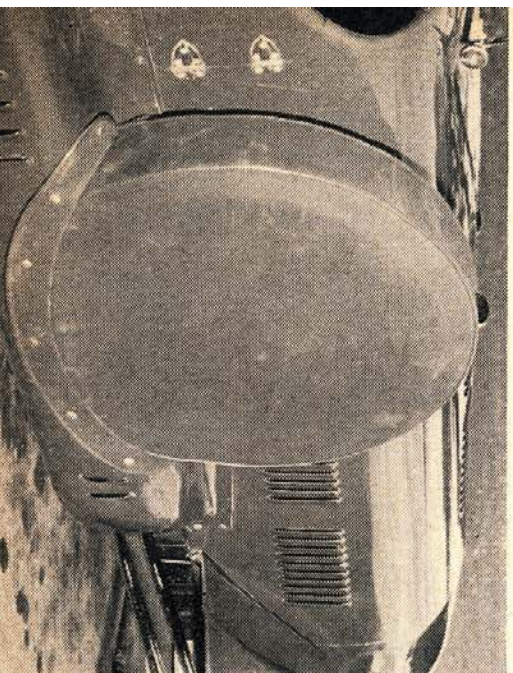
## 2. GENERAL:

(a) Except where this regulation is specifically relaxed by the Race Committee, front and rear tires must be of the same size.

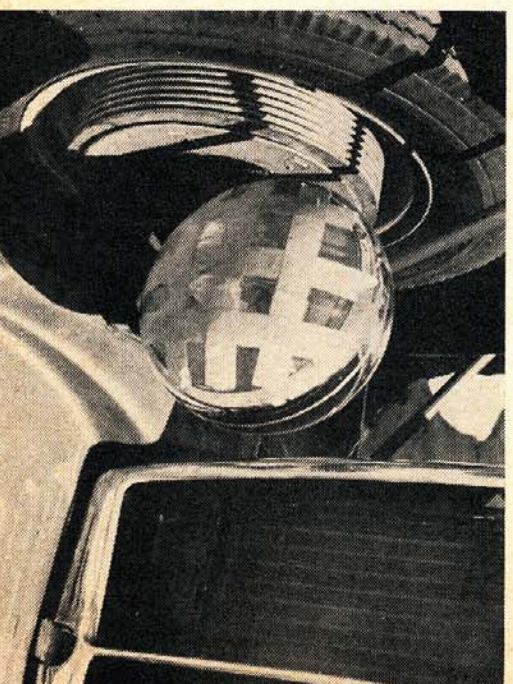
(b) Unless otherwise stated, a spare wheel and tire must be carried on the car and must be mounted in such a position as not to conflict with the space reserved for driver and passenger.

(c) Full electrical equipment, including

*A spare wheel and tire must be carried on the car and must be mounted in such a position as not to conflict with space reserved for driver and passenger*

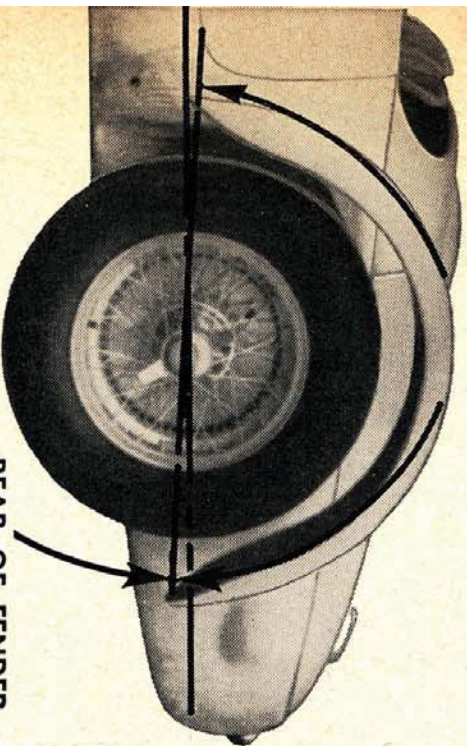


*For racing, the required headlights are taped to eliminate the danger of flying glass in case of an accident. Windshields and taillights are also taped*





MORE THAN  $\frac{1}{3}$   
CIRCUMFERENCE  
OF WHEEL



REAR OF FENDER  
BELOW LINE

Exacting rules are laid down by the FIA for fenders for sports cars. This XK-120, owned by Fitch-Whitmore, easily meets the requirements

STARTER



BATTERY

GENERATOR

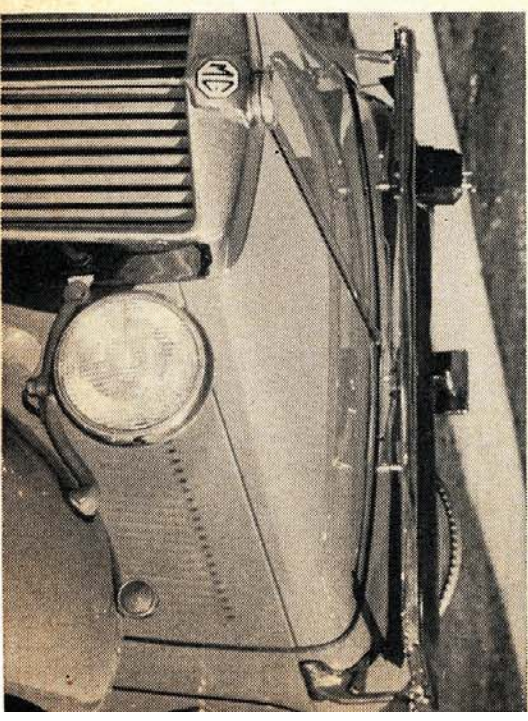
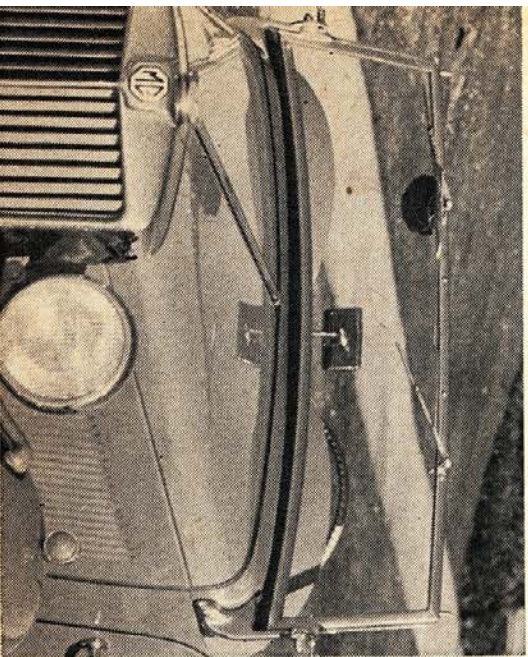


*A sports car must carry full electrical equipment; the self-starter is one*

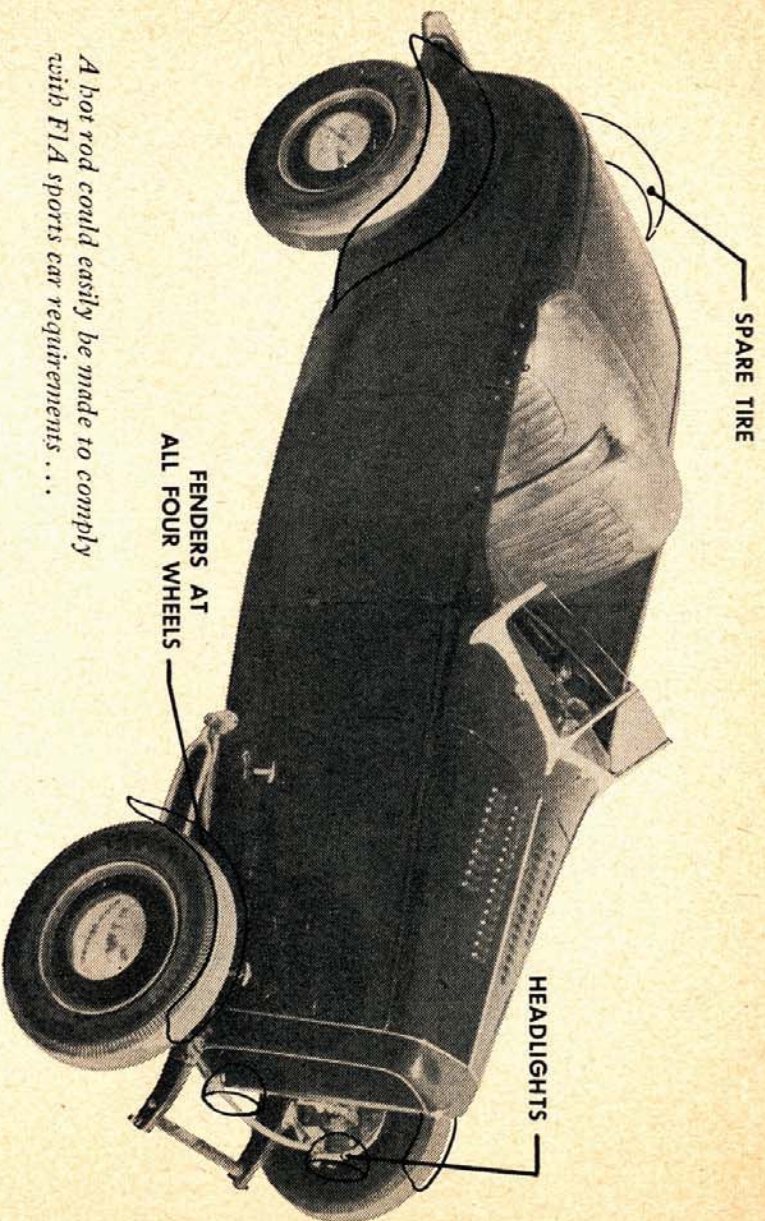
*A windshield is compulsory, measuring not less than 27.5 x 7.9 inches . . .*

Besides the generator and battery shown here, normal car lights must be installed

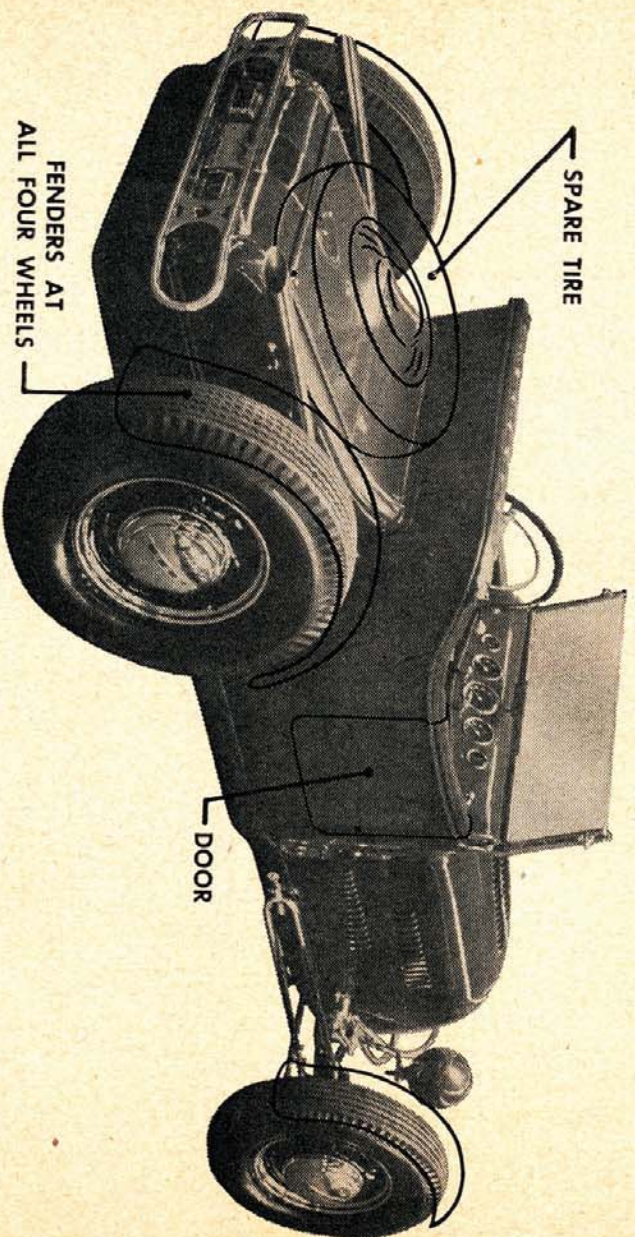
*. . . though it may be lowered at the driver's discretion*







*A hot rod could easily be made to comply with FIA sports car requirements ...*



*... by simply adding fenders, spare wheel and tire, at least one door ...*





*A family car such as this Buick convertible may be a sports car by the broadest definitions of the FIA but handling characteristics would not pass the demands of a real enthusiast*

self-starter, generator, battery, normal road lights and stop lights conforming with catalog specification must be carried on the car and must be in operative condition.

(d) The use of special fuels and fuel mixtures, together with water or alcohol injection and additives of any kind other than upper cylinder lubricants, is prohibited.

(e) Where a manufacturer has not ac-

tually built, sold and delivered 10 examples of what may appear in his catalog as a "production sports car," he may, at the discretion of the Race Committee, be allowed to compete with the specimen entered, provided he can produce bona fide evidence of *intent* to manufacture, sell and deliver at least 10 of these machines.

All this is great stuff, but where does it get off in defining what constitutes a genuine

*Compare the heeling characteristics of this SS100 with the Buick convertible on the same corner in the above photo. Lateral stability on turns is a "must" for the true sports car*





sports car? A hot rod could easily be made to comply with all these requirements; so could a gingered up family chassis with a lightweight "competition" body; so could an outright Grand Prix machine equipped with fenders, spare wheel, top, lights, and two seats. Indeed it may be asked: what are the successful 4½-liter Talbots which compete at Le Mans, year after year, if not thinly disguised Formula I Grand Prix cars running with a low enough compression to accommodate the poor octane rating of the fuel supplied by the race authorities?

In its attempt to nail down those factors which might be said to constitute a sports car, the International Sporting Code covers only the broadest definition, and this, obviously, is about as watertight as a sieve. Some attempt might have been made, for instance, to sift out the pseudo sports machines by requiring a minimum number of brake lining square inches for a given weight; a minimum power-weight ratio; a maximum steering ratio and a basic requirement in luggage space, however small. Further, it could be specified that the engine, as well as the chassis, be built by the manufacturer, thus prohibiting the adoption of power units originally designed and manufactured a thousand miles away for an entirely different purpose.

There are probably many reasons why regulations are not tighter, some of them good and others not so logical; but the overall reasoning is doubtless that they can be dispensed with because competition itself, if nothing else, forces entrant and driver to come to the starting line with the most efficient equipment that can be obtained for the job. That is, if he wants to give himself a chance of finishing "in the money."

At this point we may have reached first base in identifying a sports car, but we haven't gone any further. Joe Blow, new to all this, and rightly puzzled, may well ask: "How come that some convertibles rate as sports cars while others do not?" Or, "Why is it that some sedans are considered sports cars and some open roadsters are not?"

The answer, of course, is that despite accepted international road racing rules, bodywork has nothing to do with the matter. It's the chassis alone that counts. Back in the Mid-Twenties, mechanics at the old Bentley Motors firm in London had built up a highly tuned three-liter "Red Label" chassis from parts in their spare time and equipped it with a light platform-type truck body. Even

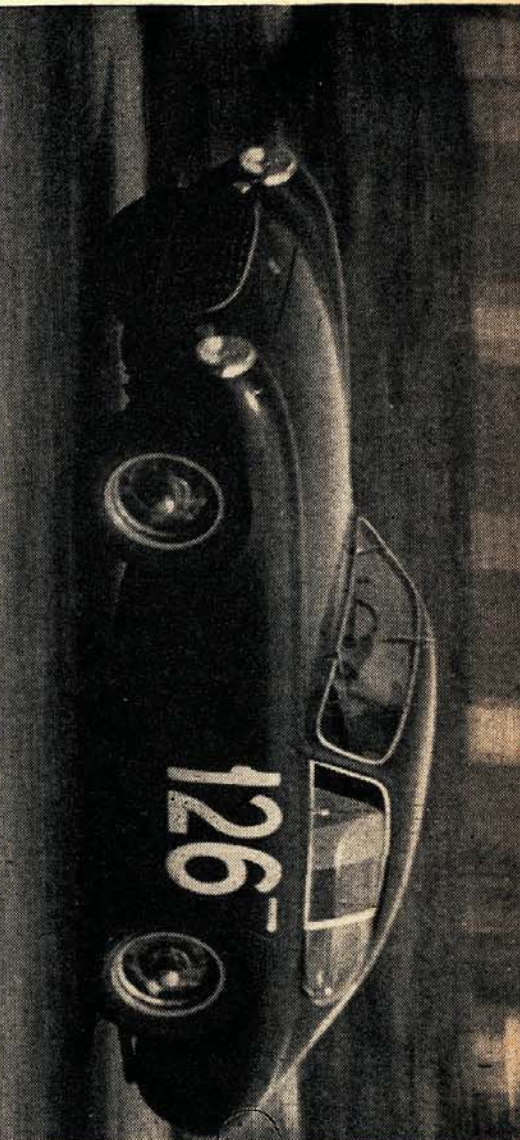
so dressed, this car would better go mph and had terrific acceleration, wonderful brakes and roadability of the highest order. Time and again it trimmed the pants off regular sports cars with conventional bodies, whose drivers were lured to certain defeat by this truck's innocent appearance.

Attempting a definition of a sports car acceptable to the majority of enthusiasts is a tough job, but there's no harm in trying. It can be said without fear of too much contradiction that a genuine sports car is a machine designed primarily with an eye to competition (racing and hillclimbs), yet readily capable of daily usage under normal traffic conditions. Obviously, such a machine must have built into it the ruggedness, lightweight strength, top-notch roadability and high performance relative to size found in the race car; yet be reasonably docile, comfortable, practical, weatherproof, dependable and simple to drive.

As in everything else mechanical, the best all-round results can only be achieved by skillful compromise, but regardless of other considerations, the following requirements are a "must":

1. Light but positive steering which allows for quick correction in case of a skid, without having to crank the steering wheel through five or more complete turns from lock to lock.
2. Smooth yet firm suspension providing reasonable lateral stability on turns with freedom from dangerous "kneeling" action when the brakes are applied hard, and from "horseback" ride on washboard roads.
3. A favorable power-weight ratio designed to give each hp developed by the engine as little work as possible to do in lugging useless deadweight around. As a rough guide, anything below 25 lbs./bhp is fairly good, and anything below 20 lbs./bhp very good. The average family sedan's engine has to haul about 35 lbs./bhp around, much of it cumbersome sheet iron. This means poor acceleration and high gas consumption resulting from a needlessly large engine. Under-gearing, a universal compromise, is not the answer.
4. Proper weight distribution fore and aft, with freedom from dangerous overhang.
5. A good wheelbase-to-tread ratio and a low center of gravity with the mass of weight located no more than a few



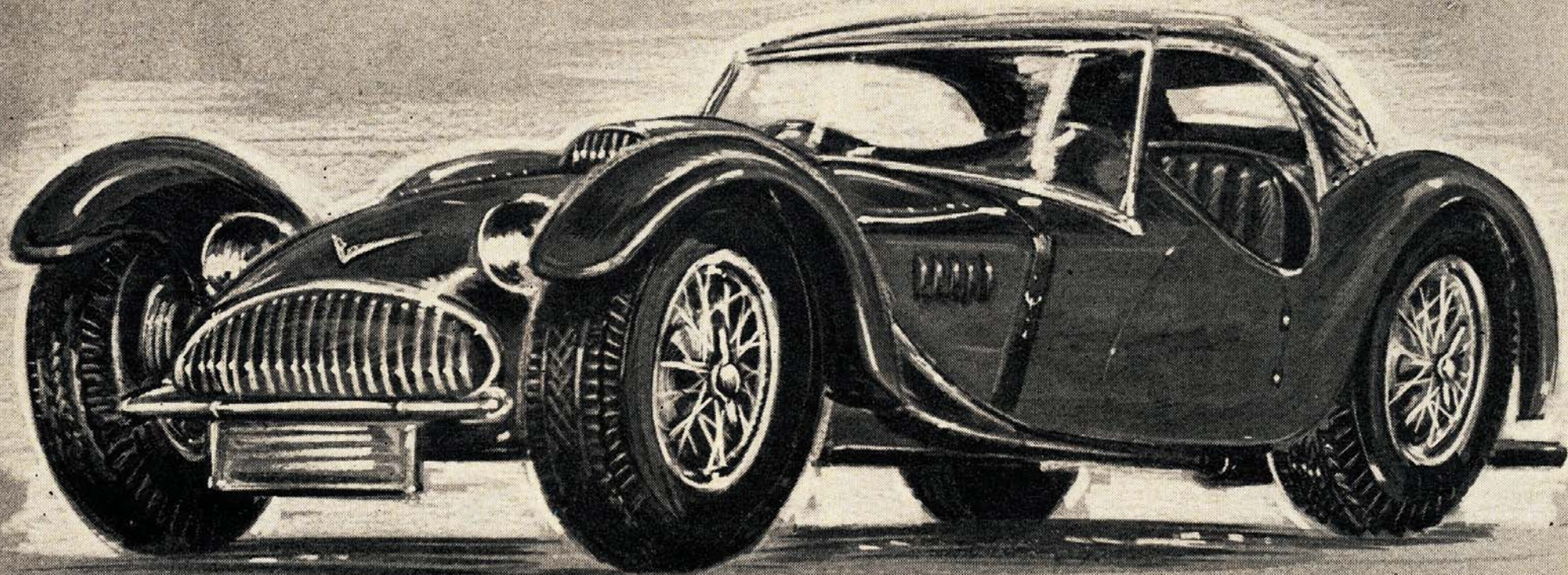


RODOLFO MAILANDER

*The top car in the sports car world today is generally conceded to be the Ferrari. In this mechanical masterpiece, the builders have achieved something close to the ultimate—the enthusiasts' dream car*

- inches above the hubline. (A chopped-down, low-looking body does *not* necessarily mean a low center of gravity.)
6. A minimum of "unsprung" weight, carried *below* the suspension where it does more harm than good. In this connection, if in no other, the rear or front drive car without a driveshaft, scores heavily. The use of a swing-type rear axle with the brake drums carried in-board and bolted to the chassis (such as on the Allard) is another big improvement.
  7. Brakes with an *ample* lining area in relation to the load that may have to be stopped in a hurry, and with lightweight aluminum drums, properly cooled by the airstream and inherently capable of dissipating heat at a rapid rate. Quick stops are little use if you can't go on making them, and under hard racing conditions poor heat dissipation always results in fading brakes after a short time.
  8. Preferably a four-speed transmission (there isn't an engine so big that it can't use an additional speed with benefit) that has carefully chosen ratios with an eye on the best possible performance through the intermediate gears.
  9. An engine with a bore and stroke of about the same measurement, limiting destructively high piston speeds which cause vibration and rapid wear while subjecting the rod bearings to unnecessary loads. The "square" engine is theoretically ideal in this respect. Any en-
- gine that can cruise a sports car at, say, 70 mph, without exceeding a piston speed of 2,500 ft. per min. is generally a good one. Given proper dynamic balance, high rpms are far less destructive than high piston speeds.
10. A compression ratio capable of absorbing pump gasoline without undue "pinging"—which with today's octane ratings sets a limit of about 8 to 1 with an L-head, proportionately higher with overhead-valve engines.
- The body can be of any kind—open, closed or convertible, so long as it's reasonably light, presents a low frontal area and induces a minimum amount of wind-drag.
- Very few imported sports cars, unless in the \$10,000 bracket such as the Ferrari, combine all these characteristics; but quite a few, more moderately priced, feature enough of them to deserve classification as genuine sports machines.
- As practical proof of what a genuine sports car can and should be able to do, last year I drove my Jaguar XK-120 from New York to Elkhart Lake, Wisconsin, about 1,000 miles; changed the plugs, removed the windshield and competed without preparation in a 200-mile road race. The car gave no trouble, made only one pit stop for routine refueling and finished in perfect shape, about halfway through the field. After the race, the normal plugs were put back, the windshield replaced and the car driven 1000 miles home to New York, without so much as a screwdriver being used on it.
- That's what the enthusiast means by a real sports car.





*The above design is Artist John Burton's conception of a sports car with the following desirable features:*

- |  |                                      |  |
|--|--------------------------------------|--|
| 1. Engine that will cruise the car at 70 mph at less than 2500 fpm piston speed and using pump gas | 3. Four-speed transmission           | 8. Proper weight distribution front & rear |
| 2. Power/weight ratio less than 25 lbs per bhp   | 4. Light, positive steering          | 9. Low center of gravity                   |
|  | 5. Open, closed, or convertible body | 10. Ample brake lining area                |
|  | 6. Proper fenders                    | 11. Spare tire                             |
|  | 7. Smooth, yet firm suspension       | 12. Minimum amount of overhang             |