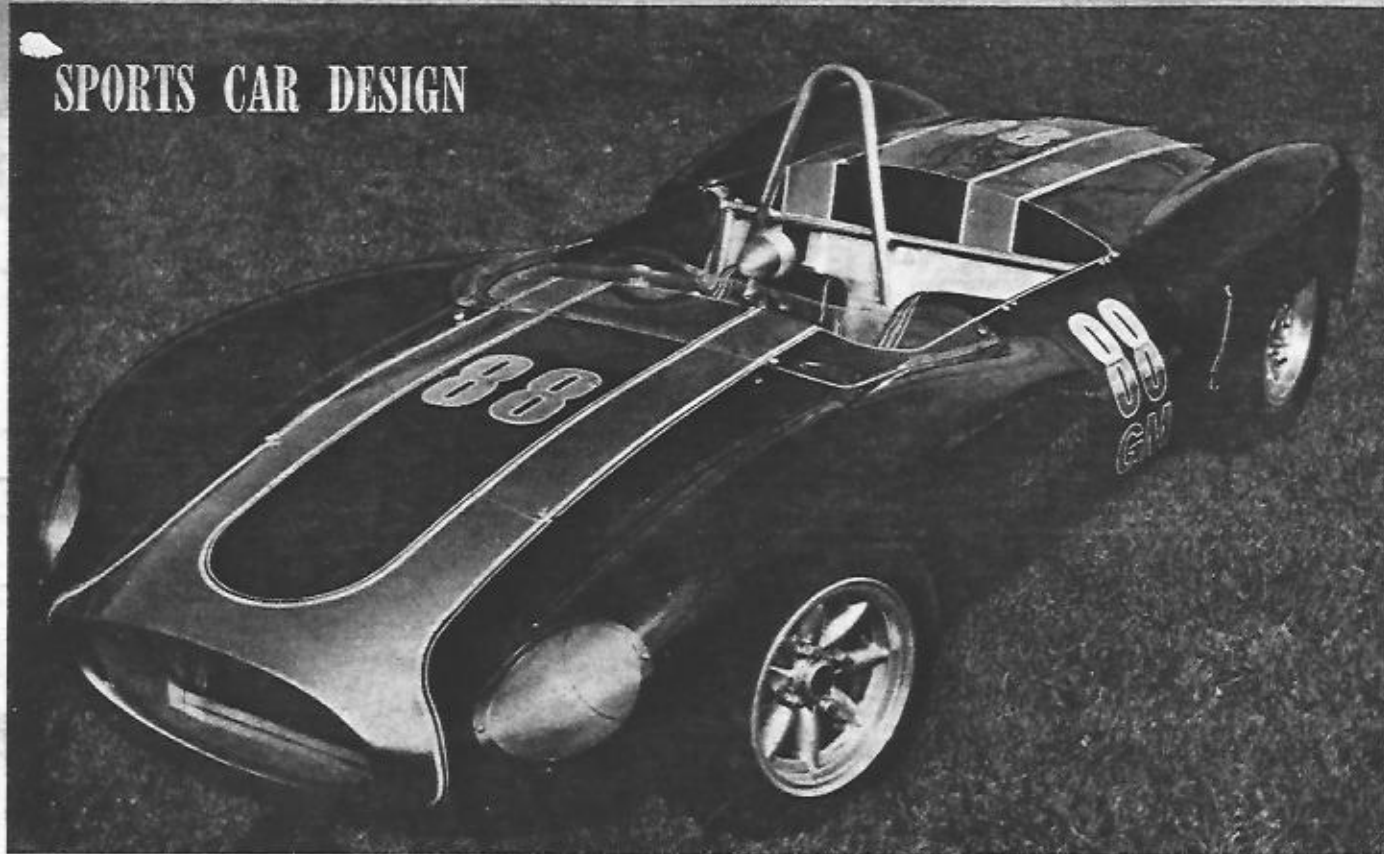


SPORTS CAR DESIGN



BOBSY II

*Sports/racing challenger
from the Midwest*

BY TONY HOGG

A RECENT ARRIVAL in sports car racing is the Bobsy II, manufactured by the Bobsy Division of the C. W. Smith Engineering Co., Medina, Ohio. In the hands of driver Chuck Dietrich, the car was a success in its first full season and won the SCCA national championship in Class G modified.

The driving force behind the Bobsy is Detroit sportsman C. W. Smith, owner of the C. W. Smith Engineering Co., which has government contracts and also does engineering work for both Ford and General Motors. With this kind of backing, the Bobsy has been professionally constructed by full time workers rather than on the weekend and evening schedule that brings many competition cars into being. Actually, the parent company's relationship is mainly one of financial backing and counsel and the Bobsy Division is a completely separate operation.

In charge of design and construction is Gerald "Jerry" Mong, who is C. W. Smith's nephew. He is assisted by Ronald Bachman. At the present time two cars are being constructed in a new shop of 1500 sq ft, which is in the process of being set up for limited production.

Preceding the Bobsy II were two other cars, constructed

in 1962. However, these were specials built more for fun than profit. Their chassis construction was all aluminum, as in the Bobsy II, so in effect they were test beds for the more serious effort in 1963. These cars were powered by DKW and Saab engines and they were run in a total of 18 events. Because both power units were run in stock form, their successes were not particularly stunning, although no failures were experienced in the aluminum construction.

When plans were made for the 1963 season, it was decided to build a car to run in class G that would be strong enough to take engines up to two liters, but light enough for class H. With this in mind, it was decided to continue using aluminum ➡



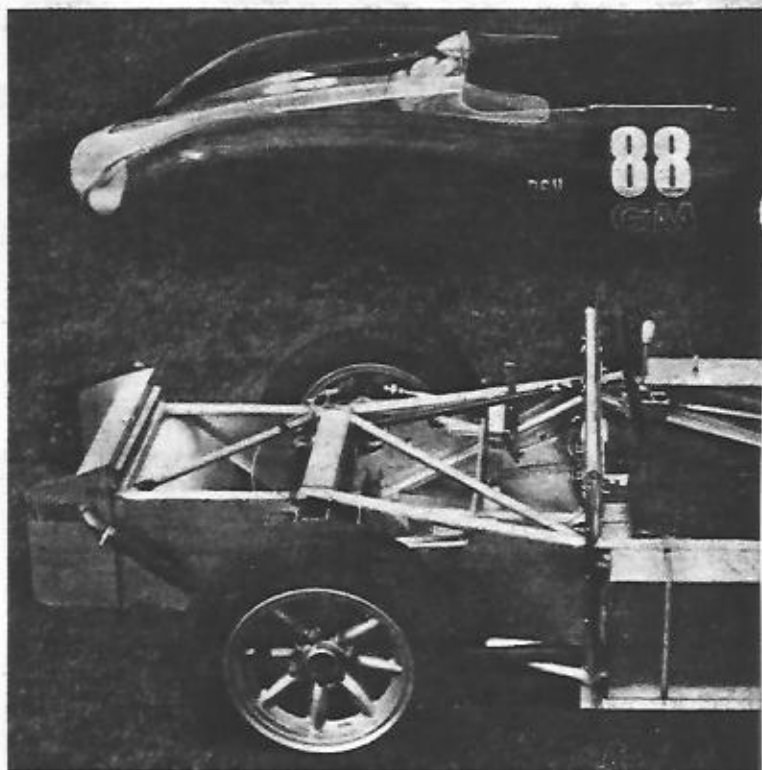
BOBSY II

alloy for as many chassis parts as possible, and this is where the car's most interesting features lie.

The space-type frame is constructed from aluminum alloy tubing in three different sizes: 0.75, 1.0 and 1.25-in. outside diameter, with thicknesses of 0.083, 0.065, and 0.049, and there are four aluminum alloy bulkheads to increase torsional rigidity. The method of construction and the materials used have resulted in a frame weight of 44 lb including the bulkheads.

There are a good many pros and cons involved in the use of aluminum tube for chassis construction, and mild steel is the choice of the great majority of constructors because much the same results can be achieved and it is far easier to work. Aluminum is admittedly lighter, but to obtain the same strength and rigidity larger diameter tubes must be used (or, alternatively, more of them) so that the benefits of the light weight are to a certain extent lost. Furthermore, the welding of aluminum presents a problem because the metal must be shielded from the atmosphere with an inert gas by some such specialized method as Heliarc. Thus, in the event of a fracture at a critical time one cannot just dash to the end of the pits and get to work with the torch. These are some of the reasons aluminum is not usually selected as the material for frames in competition cars.

In common with other sports/racing cars, the space frame of the Bobsy is of necessity a compromise because a true space frame is almost impossible to achieve, although this is considerably easier where single-seaters are concerned. An additional "Y" section to provide triangulation is bolted in

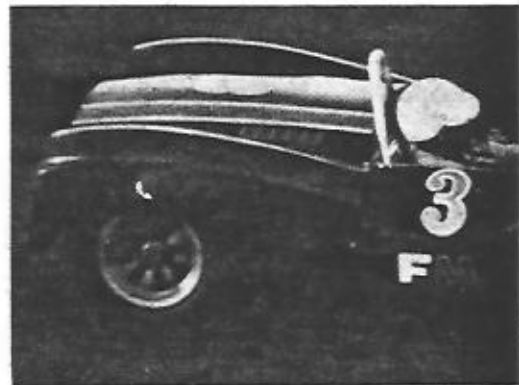
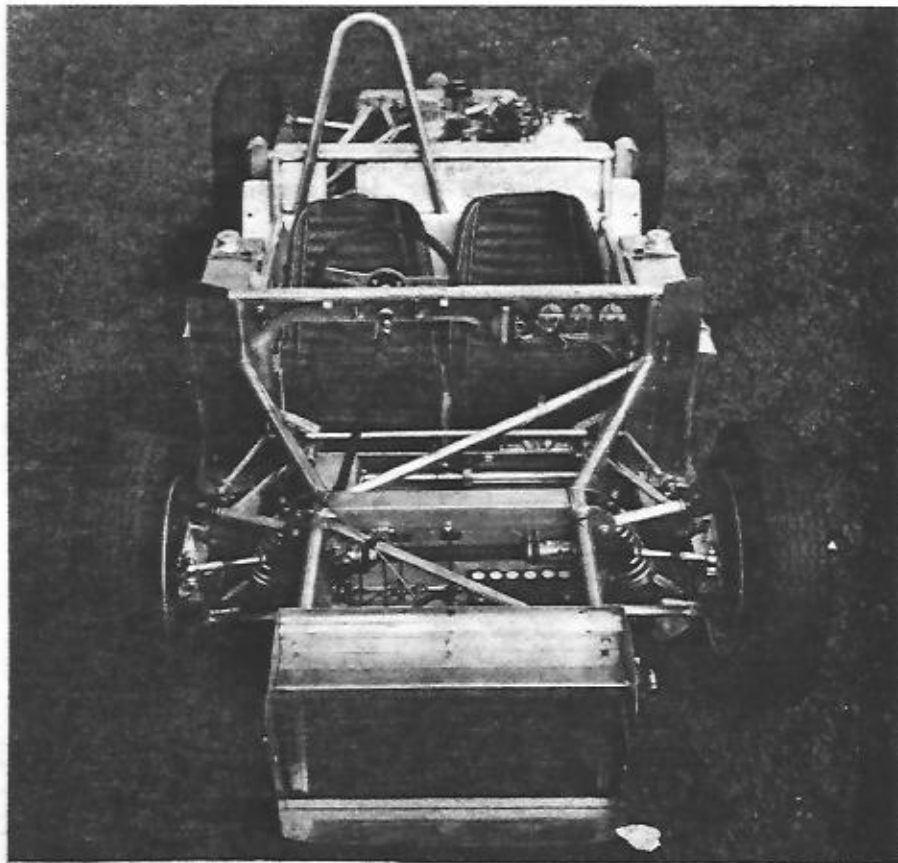


Two-piece fiberglass body is quickly removable.

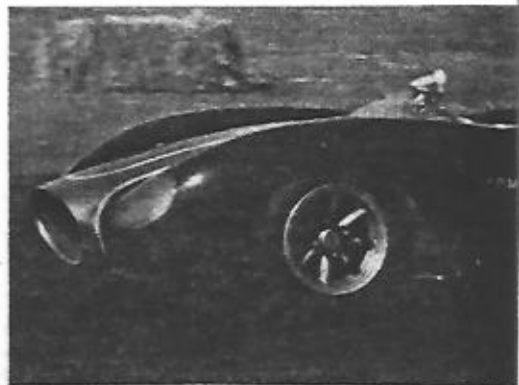
over the engine compartment so that it can be removed for accessibility, and this is now fairly common practice among constructors.

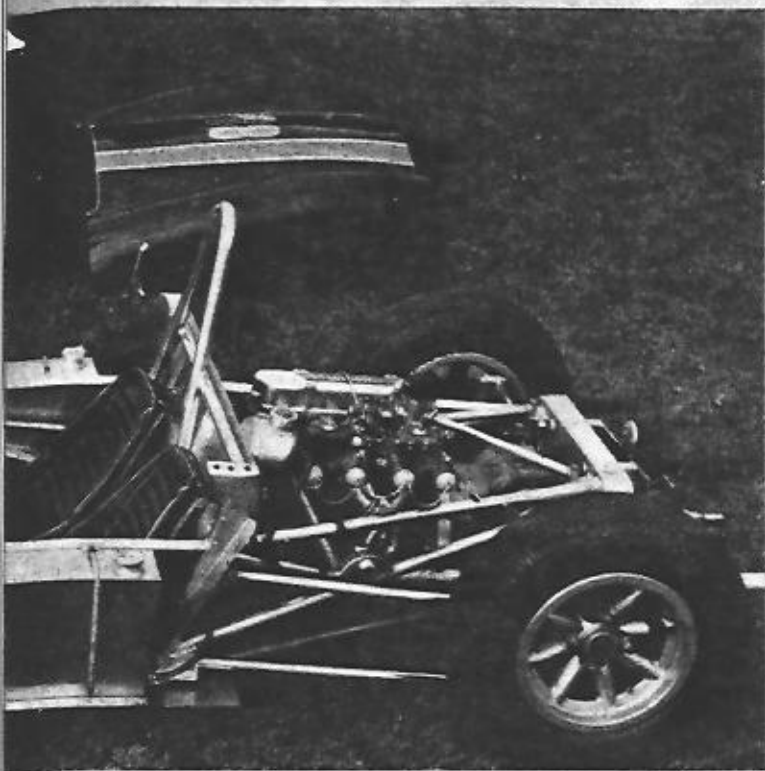
The layout of the car follows the current generally ac-

Frame and many other components are fabricated from aluminum alloy.



General layout of the car follows current sports racing practice.





cepted lines for sports racing machinery. Suspension is independent at all four wheels, the engine is in the rear with the transmission behind it, disc brakes are used all around, and two side-mounted fuel tanks are installed.

At the rear, the magnesium hub carriers are supported at the top by a single aluminum control arm, and at the bottom by an inverted A-arm with parallel trailing arms to take care of braking torque. The top control arm is adjustable for camber, and provision is made for altering the height of the roll center to 4, 4.5 or 5 in. by relocating the inboard mounting of the lower A-frame. At the same time, alignment can be adjusted by means of a Heim joint on the outside front corner of the lower A-arm. In this manner, the rear suspension is made fully adjustable for all conditions.

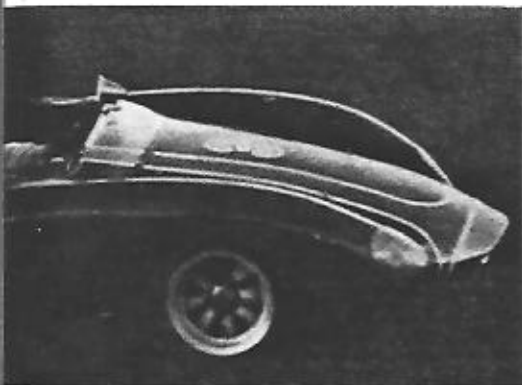
A novel feature is the Metalastic universal joints used both inboard and outboard on the axle shafts. Bobsy claims to be the first to use these joints on a competition car and, if this is so, Colin Chapman was not slow to follow suit. It is likely that this type of joint will become considerably more common in the future because it performs the additional function of absorbing some of the shock of sudden braking and acceleration.

The disc brakes are mounted outboard at the rear, more for convenience than for any other reason. Various factors affect the location of rear brakes, and one of them is the necessity for transferring the braking torque to the frame, which can usually be accomplished more efficiently when the brakes are situated at the transmission rather than at the ends of the axles. However, an outboard mounting does overcome the problems of brake heat being dissipated into the transmission, but at the expense of an increase in unsprung weight. This is not a very critical factor, because the surface of most courses in use today is generally smooth.

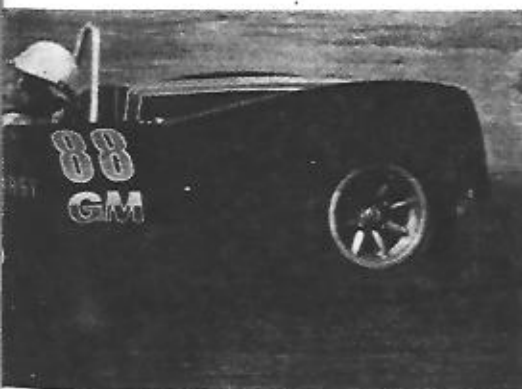
During the 1963 season Cooper Formula Junior wheels were used, fitted with 4.50 x 13 tires at the front and 5.30 x 13 at the rear. However, Bobsy is having its own wheels made up and these will be fitted to future cars.

The braking system used is Lockheed, although the discs are made up by Bobsy from Meehanite castings, and the front diameter is 9.5 in., with 9 in. at the rear. Considerable

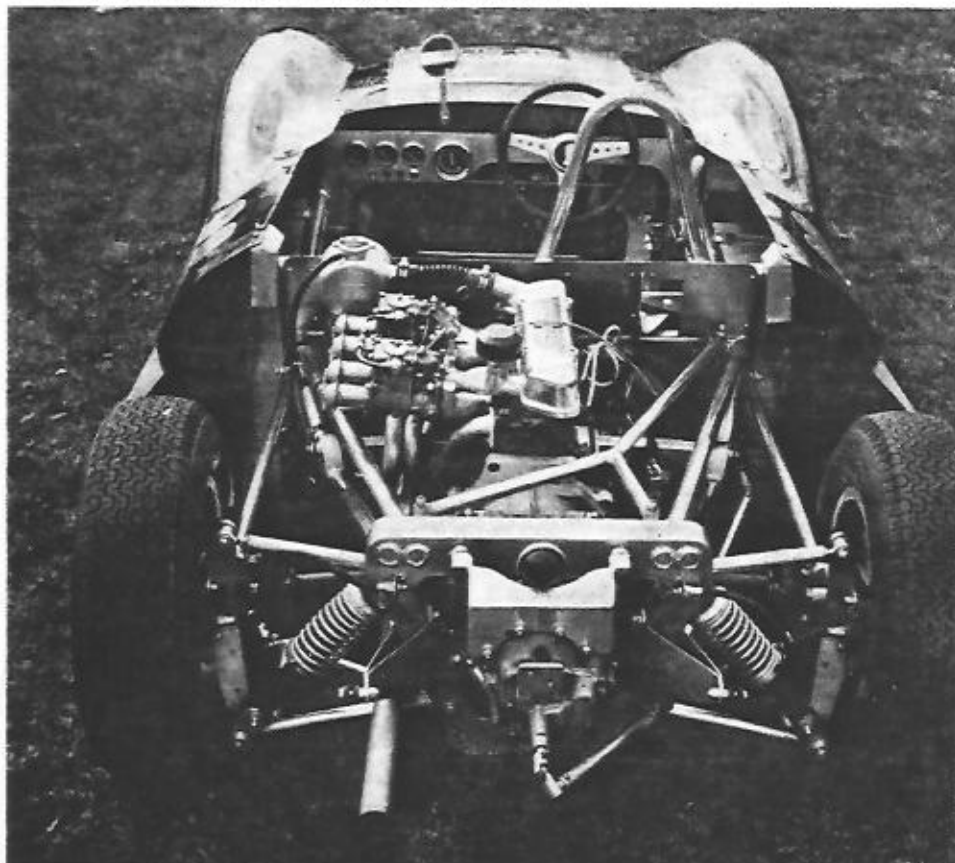
Car is designed for engines between 850 and 2000 cc.



Bobsy won SCCA National Championship in Class GM, driven by Chuck Dietrich.



PHOTOS BY JOHN HOLMES



BOBSY II

testing was done with Airheart single and double spot calipers, and the single-spot type were found to be more than adequate, although the double spots do give an additional margin and are still about 2 lb per caliper lighter than Lockheed. Dual master cylinders are used with an adjustable balance bar, so that the braking effect can be regulated front and rear.

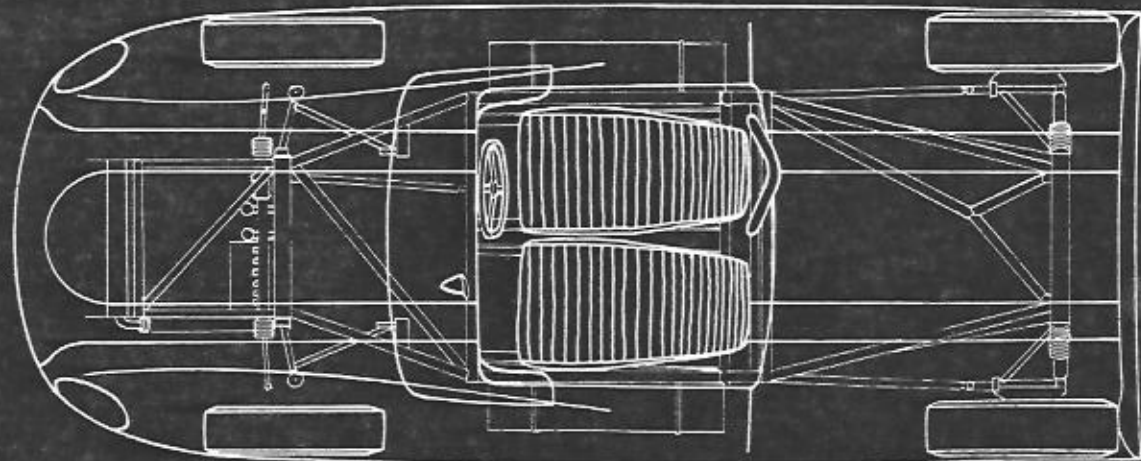
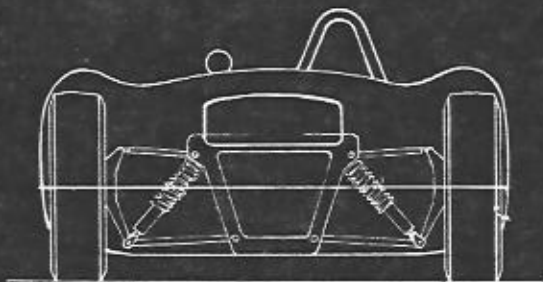
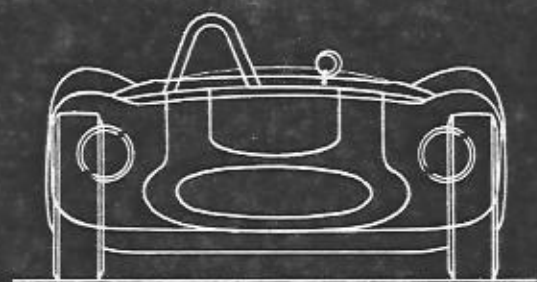
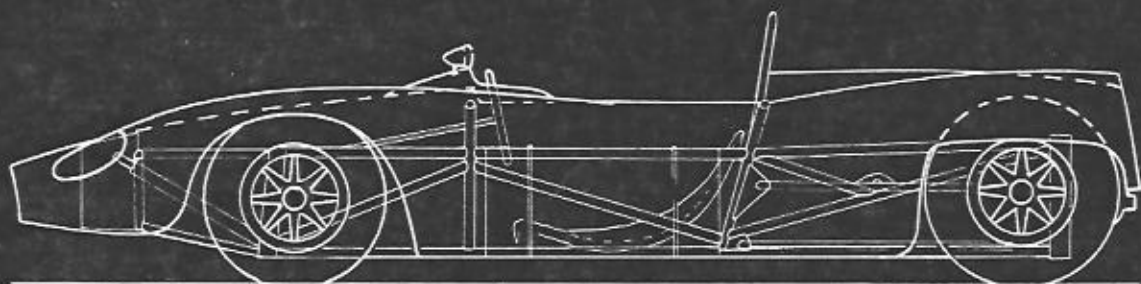
As far as the front suspension is concerned, unequal-length aluminum A-arms are used with Triumph Herald uprights, although these uprights are to be replaced by others of Bobsy manufacture, because they force a compromise in the geometry. The front and rear suspension units incorporate Gabriel shock absorbers, which are adjustable in three positions, and Bobsy has its own springs specially wound.

An adjustable anti-roll bar is used, and the steering is managed by a rack and pinion with 2.25 turns from lock to lock.

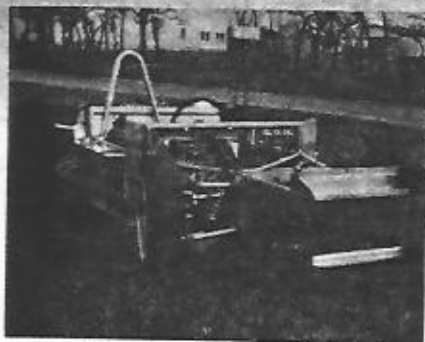
A fiberglass body in two sections envelopes the car. The rear half can be removed instantly and the front half in about three minutes by releasing 24 Vibrex fasteners.

For the 1963 season the car was powered by an 1100-cc Holbay-tuned Ford engine coupled to a 5-speed Hewland VW transmission, and on certain occasions was run in a larger class using a 1500-cc version of the same engine. At the present time, cars are being offered for sale at \$3995 less engine and transmission, or at \$4995 ready to go in classes F, G or H. The latter price includes Webers for the engine and a 4-speed transmission but, as with all competition cars, a variety of options can be specified which will raise or lower these prices, and Bobsy is willing to undertake special installations such as Alfa or Climax engines. Another feature of the Bobsy service is that a small stock of the more vulnerable and fast-wearing parts will be maintained so that there will be no delay in supplying replacements.

Current sports racing cars bear a very marked resemblance to each other and, from casual inspection, do not appear to



SCALE: 1/2 INCH EQUALS 1 FOOT

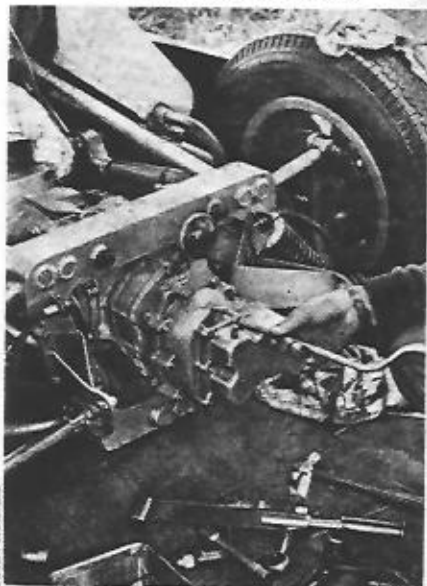


Suspension uses aluminum A-arms.

differ in other than small detail. However, it is the variation in design of many detail items that can make the difference between a successful and an unsuccessful car. This situation has arisen in part from the tendency in England to run short sprint races on circuits with near-perfect racing surfaces, and incorporating a series of fast turns which put a premium on high speed road holding. The resulting car is a far cry from the D-type Jaguar or DB-3-S Aston Martin of only a few years ago, which were true sports racing cars in the best sense of the term.

In the case of the Bobsy II, it is evident that the right combinations have been found in both design and construction. The result is a car that can be purchased at a reasonable price and is competitive with anything in its class. Admittedly, it was driven throughout the 1963 season by Chuck Dietrich, who is a very skillful and experienced driver, and undoubtedly his skill was a factor in winning the SCCA national championship in class G. But, however the car's success was achieved, the fact remains that you can't knock it, and we can look for a considerable expansion in Bobsy activities during the 1964 season.

Transmission is Hewland 5-speed.



JOHN HOLLANDS

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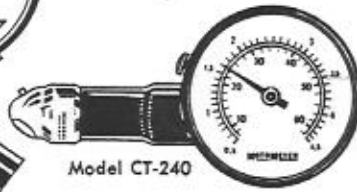
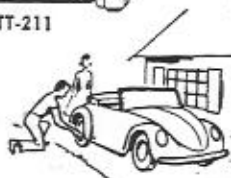
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