FUNDAMENTALS OF THE MODERN AUTOMOBILE: FIRST OF A SERIES

ROAD & TRACK

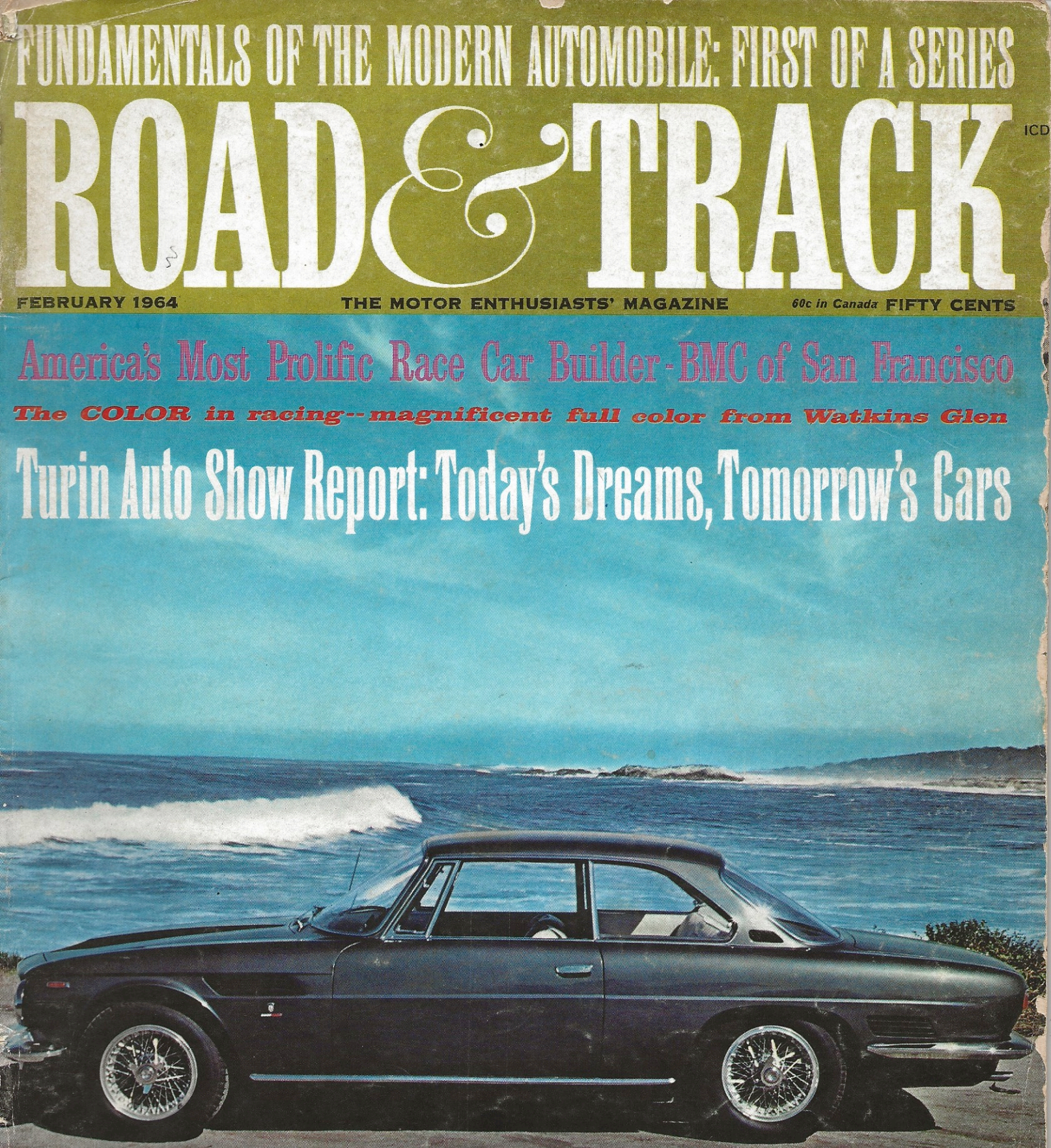
ICD

FEBRUARY 1964 THE MOTOR ENTHUSIASTS' MAGAZINE 60c in Canada FIFTY CENTS

America's Most Prolific Race Car Builder - BMC of San Francisco

The COLOR in racing -- magnificent full color from Watkins Glen

Turin Auto Show Report: Today's Dreams, Tomorrow's Cars



Road test of a new 2+2 you'll wish you owned

THE ISO...CORVETTE ENGINE PLUS ITALIAN COACHWORK

BMC of San Francisco

America's most prolific builder of road racing cars

BY TONY HOGG

THE CONSTRUCTION OF competition cars on a commercial scale is a hazardous and difficult undertaking if one expects a reasonable financial return. However, British Motor Car Distributors of San Francisco, through its Competition Department, has successfully built and sold over 50 race cars in the last four years and currently has orders on the books for at least half a dozen more.

The driving force behind this operation is Kjell Qvale, president of British Motor Car Distributors (see Page 74), who has been active in the sport since the earliest post-war days. Qvale's right-hand man is Joe Huffaker, a veteran race car constructor who runs the Competition Department and is responsible for all design and construction work. Assisting him is a full-time staff of five, including specialists in machining, welding, and engine preparation.

At 35, Joe Huffaker is a burly and genial fellow, married, with three children, who is in the fortunate position of working at a job that gives him infinite pleasure and a great sense of achievement. Before joining Qvale, he had an appliance repair business and also ran a small sports car shop at his home. However, his main experience stems back to the days when he built roadsters for track racing and it is a tribute to his skill that such "names" as Bob Sweikert and Bob Veith drove his cars.

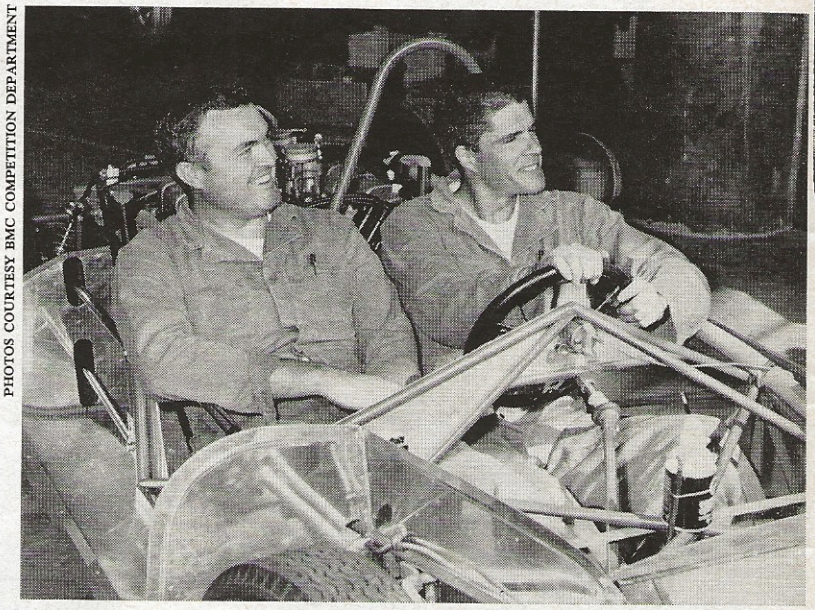
In common with a number of other specialist car builders, Huffaker has had no formal engineering training and, strangely enough, the empirical approach seems to pay off in this particular field of endeavor. A possible exception is Colin Chapman, who apparently has achieved a nice balance between theory and practice and doesn't allow himself to get bogged down under a lot of science.

Huffaker's association with Qvale first started when Qvale was entering a Lister-Jaguar in local events and Huffaker was asked to undertake the preparation of the car on a part-time basis. Before long, the racing activities had expanded to the point where Huffaker found himself hired away from the appliance business and set up in a separate shop to devote his time to the construction and preparation of race cars. In this way, the Competition Department at British Motor Car Distributors was conceived.

The first car that Huffaker built for Qvale was the MK I BMC Formula Junior. This car was constructed in the true spirit of Formula Junior, as set down by Count Lurani, and if it wasn't instrumental in producing any budding Phil Hills or Dan Gurneys, it certainly wasn't the fault of the car.

Because Qvale is a BMC distributor, nearly all the components were of BMC origin. The car was front-engined, using a BMC power unit coupled to a BMC transmission incorporating Sprite close-ratio gears, although Elva gears were used in later editions, and the result was a fast, good-looking and comparatively simple car that started winning races almost from the first appearance of the prototype.

PHOTOS COURTESY BMC COMPETITION DEPARTMENT

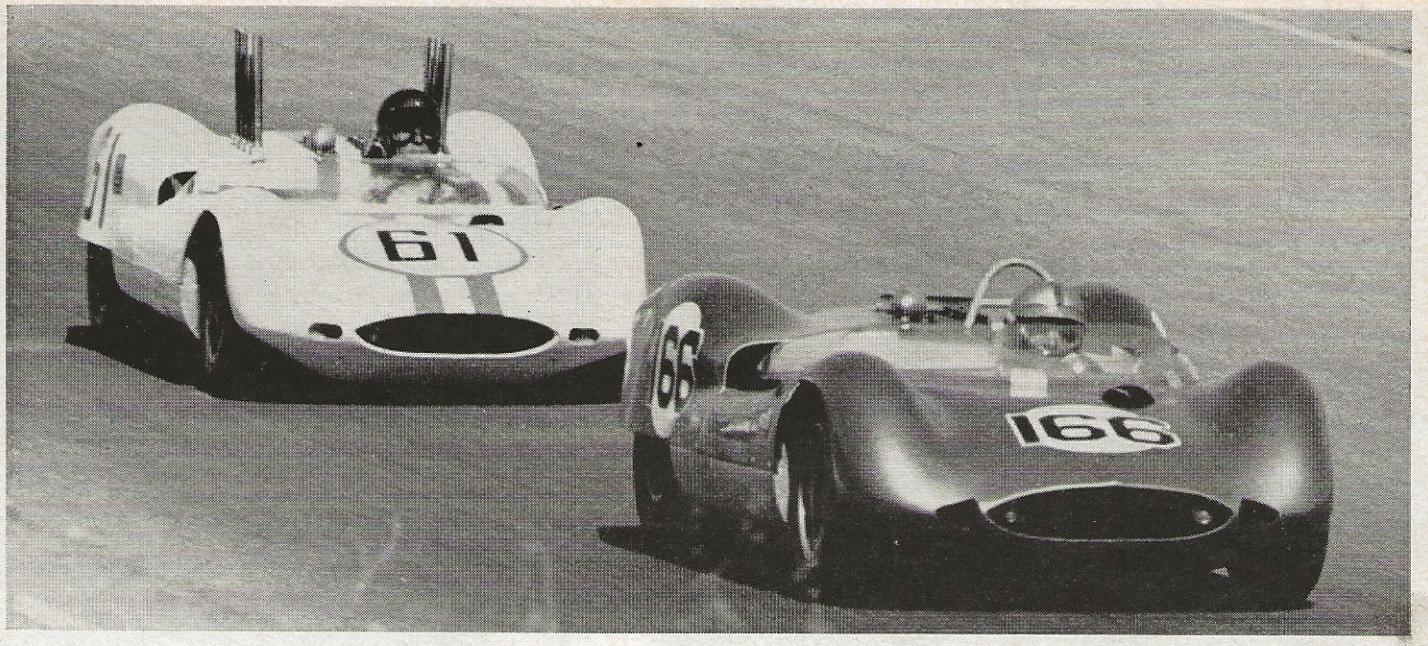


Joe Huffaker and Frank Morrill try the Genie on for size.

A total of 23 MK Is were built and sold for $3900 each and this output established Kjell Qvale as a race car constructor in his own right. However, the whole conception of Junior racing was soon changed radically by Colin Chapman and John Cooper and it was not long before the Lotus 18s appeared on the scene. Returning to the drawing board, Huffaker came up with the MK 2, which followed the trend to rear engines although the power unit remained BMC. However, the transmission was of necessity a Volkswagen case with special gears. Once again the car went into limited production, and fourteen were sold.

With the rapid changes in Formula Junior racing, a MK 3 soon became necessary, although it was the basic MK 2 updated with some detail modifications, with the most major change being the inclusion of a fifth speed in the Volkswagen case. Six MK 3s were sold, and the last one off the line was an all-out effort powered by a Cosworth Ford designed to do battle with the latest Chapman products.

Decreasing interest in Junior racing coupled with a satu-



Dan Gurney chases Pedro Rodriguez, both Genie-Ford mounted, during the Times Grand Prix at Riverside.

rated market caused Huffaker and Qvale to turn their attention to the sports car market. Their next effort was the Genie rear-engined sports racing car. The Genie was designed originally for an 1100cc power unit although it can handle up to two liters without strain and eight have been sold in this size so far. However, in sports car racing the contest is always in the big modified class, so a decision was made to produce a beefed-up version of the car which would handle such power units as the Chevy, Ford or aluminum Buick.

The bigger version of the Genie has met with such instant success that it has caused a production problem in the already overloaded Competition Department. Eight have already been sold, including one to Briggs Cunningham, and a further six are on order. The car sells for $9700, less engine but including transmission, and a complete car ready to race can be obtained for about $11,500, depending on the power unit and the number of Webers involved.

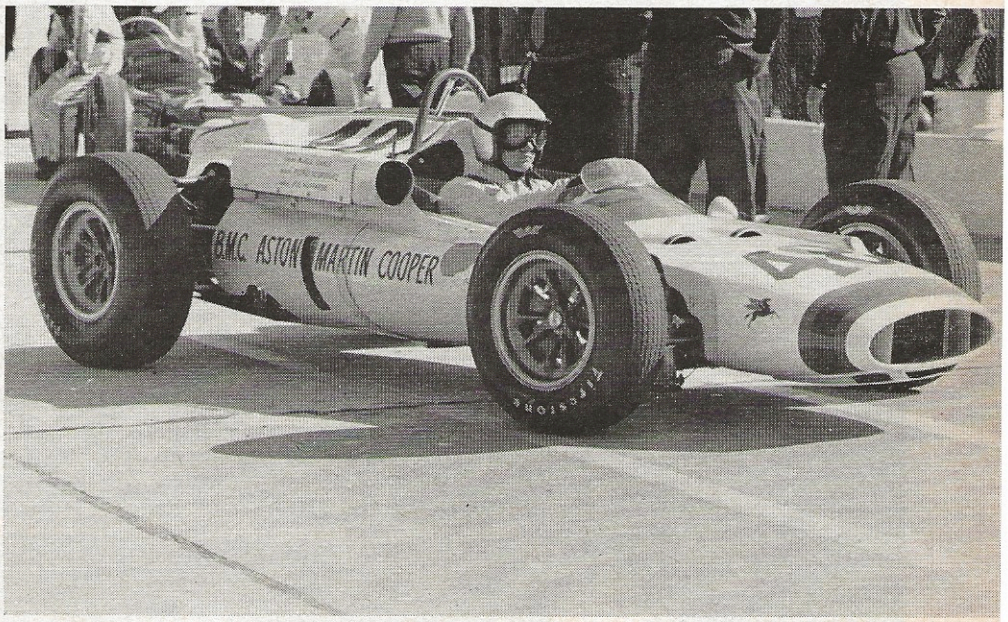
In appearance, the Genie follows the general lines of the Lotus and Cooper, but in no respect is it a copy and it incorporates remarkably few European components. In fact, these are confined to the Dunlop disc brakes, the Armstrong suspension units (although Huffaker has his own springs made up), and the steering rack, which comes from a Min. Perhaps the most interesting part of the whole car is the transmission differential unit, which is pure Competition Department and uses as many Detroit components as possible to hold down the cost.

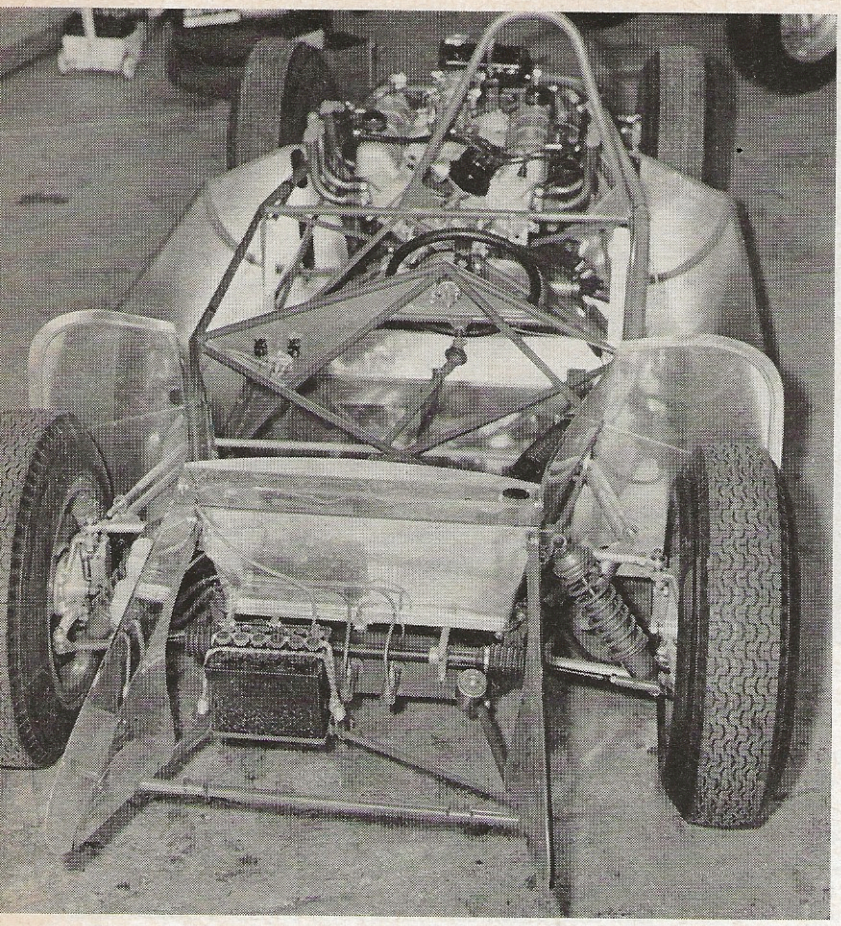
This transmission is housed in three castings, which are machined in the Competition Department. The first one holds the Ford ring and pinion and the Powr Lok differential. The second houses the transmission itself, which uses Chevy gears and special shafts. The third is a small casting on the end to hold a pair of Halibrand quick-change gears. The complete unit is most impressive, and also very robust so that it will handle the torque of the Cobra-version Ford power unit without complaint.

Transmissions present a difficult and expensive problem to the constructor of race cars, particularly when high power outputs are involved. This particular unit can be purchased complete for $1725, which may appear to be a lot of money, but the box is cheap compared with either the type 37 or type 27 Colottis, which sell for around $3000. Furthermore, the Colotti does not have the quick-change feature that is such a time-saver during a busy racing season, nor can you dash into the nearest Chevy dealer for gears when things go wrong. Although 5- and even 6-speed transmissions are currently the height of fashion, the Genie needs no more than four because the torque curves of the various Detroit engines used are by no means radical.

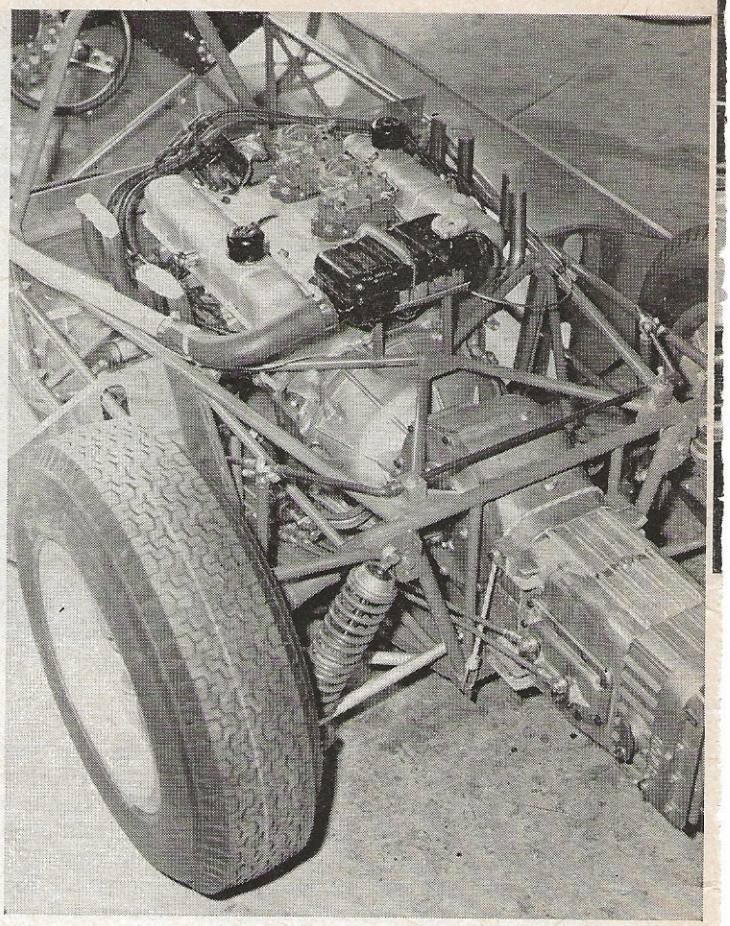
In the series of fall professional races on the West Coast, the Genie, in the hands of Dan Gurney and Pedro Rodriguez, has proved itself the equal of anything on the track in events that have attracted the cream of the world's drivers. Basic reliability has been a strong point, although with all ⟶

Pedro Rodriguez qualified the Cooper-Aston Martin at Indianapolis at 146.8 mph.





The Genie sells for $9700 complete, less engine.



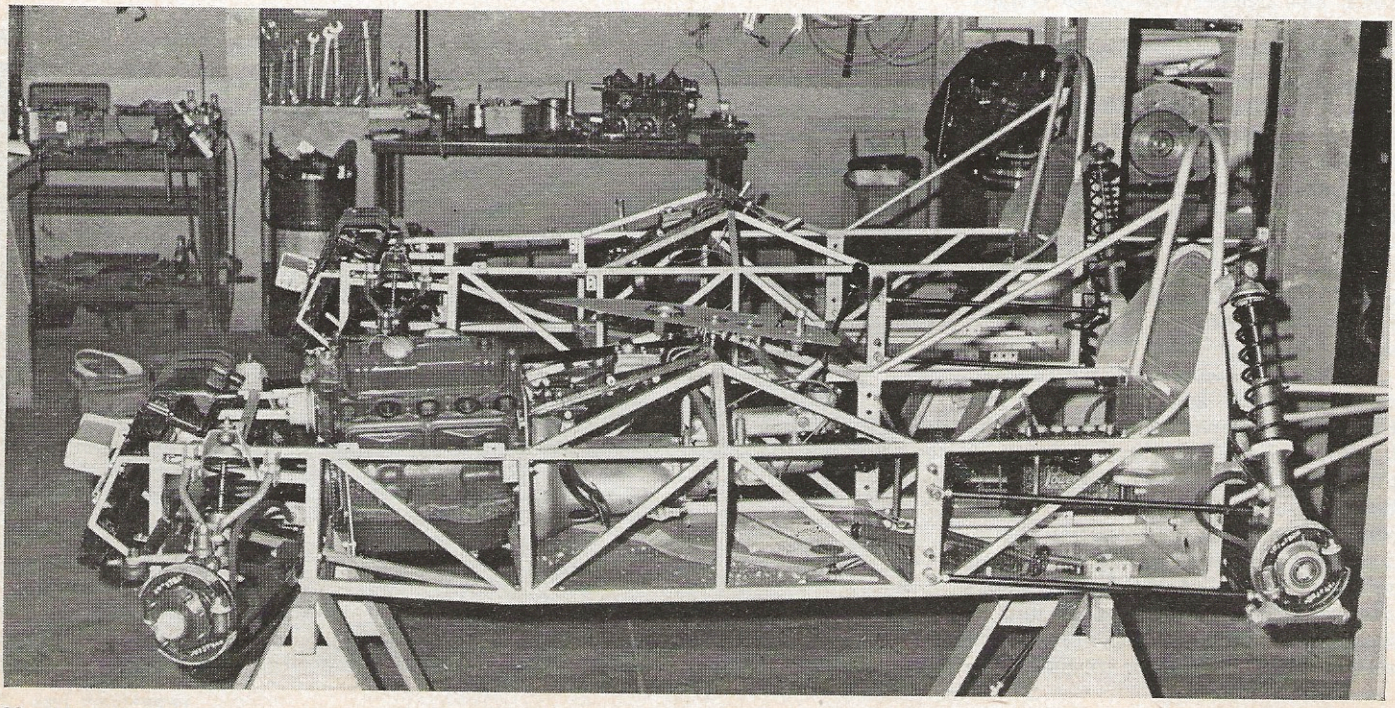
Transaxle is built by the BMC Competition Department.

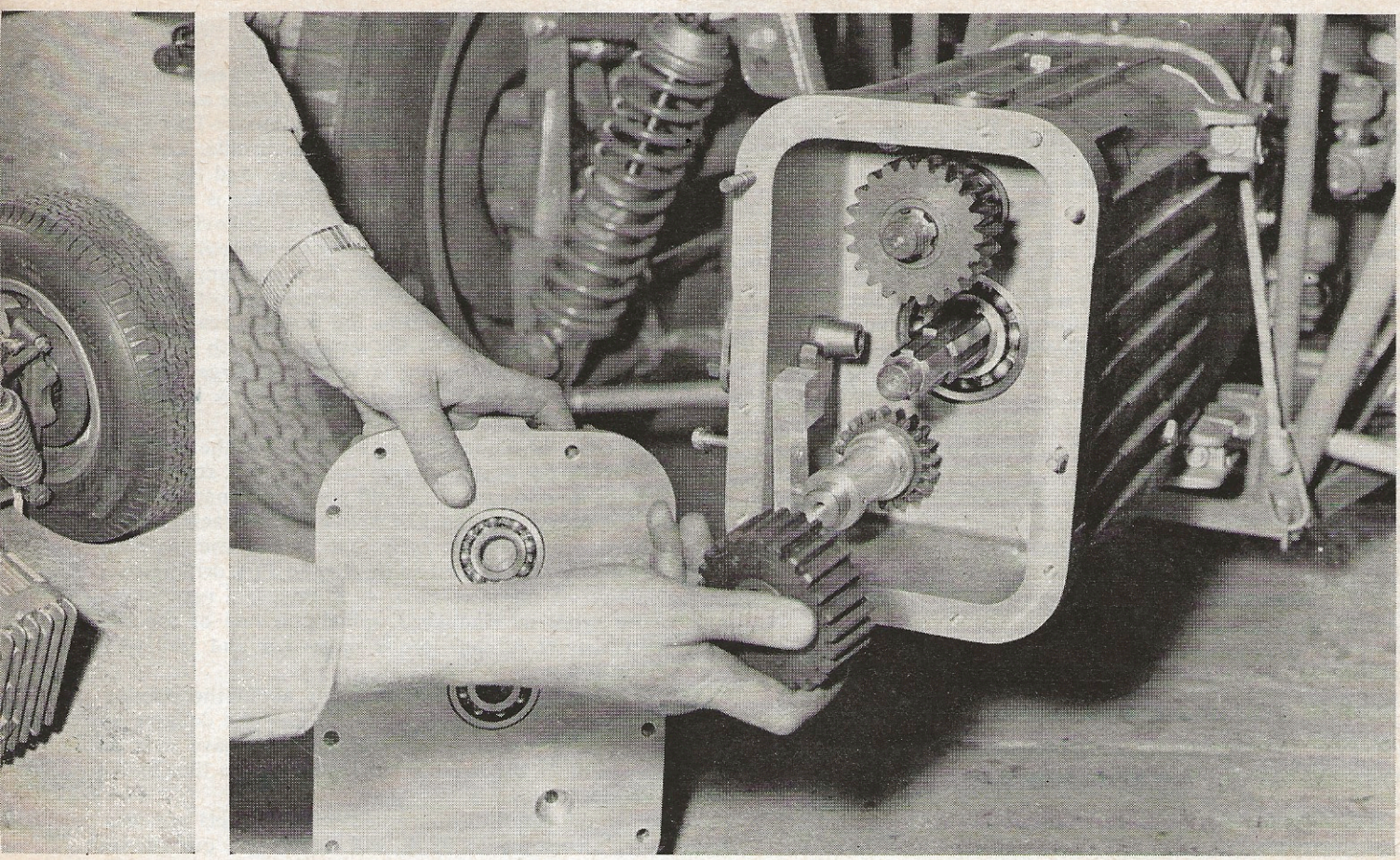
BMC of San Francisco

new competition cars, continual minor modifications and changes have to be made.

A good example is the water pump for the Cobra Ford, which is mounted separately on the frame and driven by a timing belt. During a professional race at Kent, Wash., Dan Gurney was enjoying a 36-sec lead when the belt stripped, allowing the engine to overheat. The cure was to increase

The "production line" for the original front-engined BMC Mk I Formula Junior car.



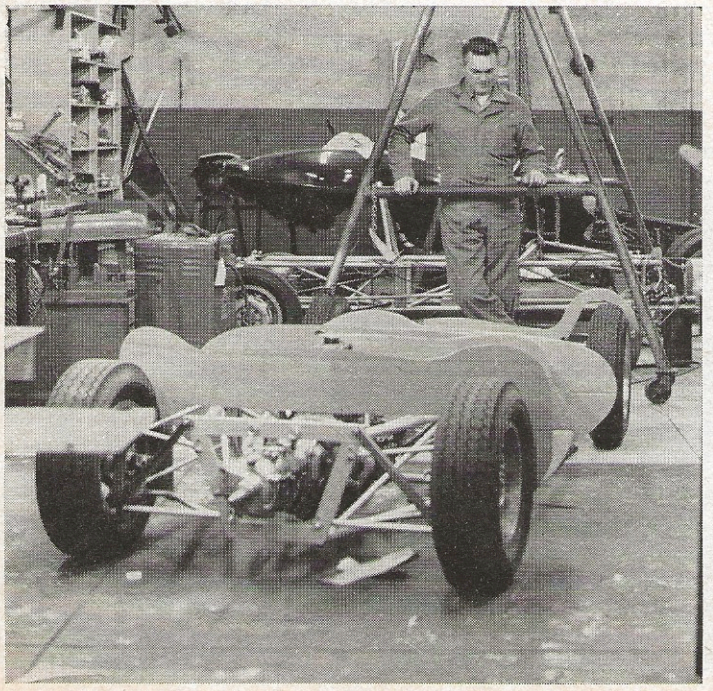


Quick-change gears are a great time-saving feature during a busy racing season.

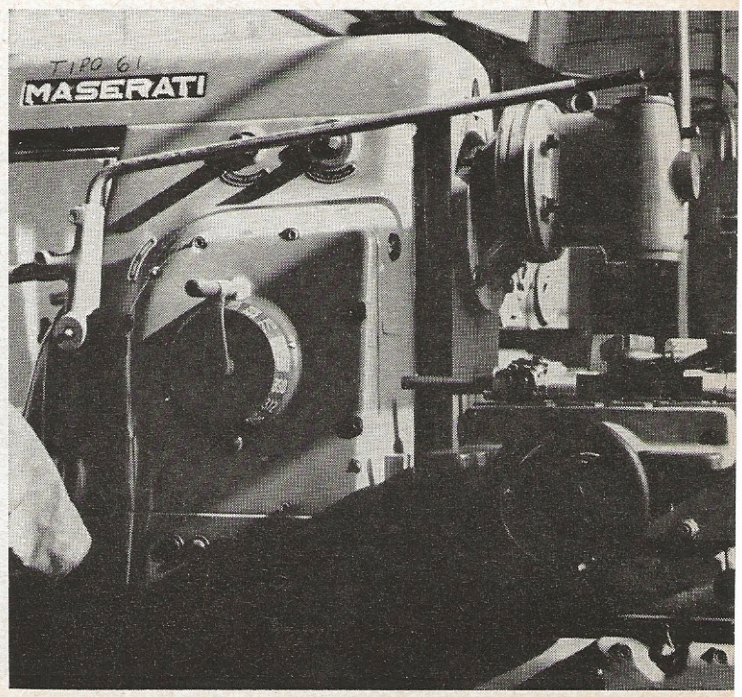
the tension of the belt, because it seems that these belts are designed for constant speed use and the recommended tension does not take into account the continual increases and decreases in engine speed during racing. The offending belt now hangs in shame on the wall of the shop alongside a little notice saying that it cost $7400 in prize money.

The function of the Competition Department is not only to design and build cars but also to make up various items of speed equipment for sale, which are offered in a small catalog, and to prepare customers' cars for competition. Furthermore, it has always been Qvale's policy to race the cars he sells. At the present time a Sprite and an MG-B are entered in production events, and a lightweight E-type Jaguar is being run in GT races. The E-type ran at Sebring ➳

Joe Huffaker relaxes while constructing the prototype Genie.



Maserati milling machine is part of BMC equipment.



BMC of San Francisco

in 1963, where it won its class in the hands of Ed Leslie and Frank Morrill and might have finished several places further up the ladder if a tire hadn't blown in the early stages of the race, knocking the suspension out of line.

All this activity requires considerable tools and equipment but on the other hand the budget is not unlimited, and at the present time about $40,000 is so invested. Perhaps the biggest single piece of equipment is a horizontal milling machine, appropriately enough of Maserati manufacture. A surprisingly large number of operations can be carried out in the shop although, in certain cases, it is more economical to farm the work out to a jobbing shop where more specialized equipment is available. This is particularly true when anything approaching a production run is involved, such as the shafts for the Genie transmission. Furthermore, it permits ace machinist Larry Bruno to employ his talents in less routine directions.

In the last three years Kjell Qvale has become absorbed by the challenge of Indianapolis. His first move was to buy the Cooper that finished ninth in the 1961 event in the hands of Jack Brabham, with the intention of entering it in 1962. However, the car could not be prepared in time so the attempt was put off until 1963, when Aston Martin offered to provide an engine.

The plan for 1963 was for Aston Martin to send over a standard GT unit to be fitted to the chassis, and then to follow up with a special racing unit as soon as it could be prepared. The installation required considerable lengthening and modification to the Cooper chassis and, due to other more pressing work in the middle of the racing season, the car had to be rushed to completion. The racing engine did not arrive until the team was already at Indianapolis, and when it was installed it didn't appear to propel the car noticeably faster than the standard GT.

Partly due to insufficient engine power and partly due to the idiosyncrasies of the qualifying system at Indy, driver Pedro Rodriguez was able to attain only 146.8 mph in qualifying and was promptly bumped although he had managed 148 mph in practice. However, the car handled well, the turn speeds were good and a lot of useful information was obtained at first hand. As far as the lack of engine power is concerned, this is thought to have been caused by the scavenger pump for the dry sump system, which is situated on the left of the Aston engine, permitting a build-up of oil in the crankcase during the long 90-degree turns.

The plans for 1964 are most ambitious. Two entirely new cars are to be built; one to be entered by Qvale and driven by Rodriguez, and the other to be sold to Ansted-Thompson Racing Inc., for their driver A. J. Foyt to handle. The cars are to be lightweight rear-engined machines, and the power units will be tried and true Offys. Joe Huffaker is aiming at 1200 lb, which would give a startling power-to-weight ratio, and among his plans is an idea for experimenting with a gasoline-alcohol blend to decrease fuel consumption and eliminate the excessive fuel load. The whole project has been carefully planned and, as soon as the cars are ready, a trip will be made to Indianapolis for testing by both Foyt and Rodriguez. Also in on the act is veteran George Bignotti, who prepares the Ansted-Thompson cars and is something of a whiz where Offenhausers are concerned.

The selection of Rodriguez as a driver for the Indy car follows Qvale's policy of offering the job to a road-racing driver rather than to one of the old guard Indianapolis men, because not only would he like to see a road-racing driver win the event but also he feels that the lightweight rear-engined cars are more suited to the Grand Prix driving style as it is today. At the same time, A. J. Foyt is a very adaptable driver who, in Huffaker's opinion, is one of the few oval track drivers to step into a sports car and take to it like a duck to water.

Qvale has some fairly firm opinions about the employment of drivers and he is very conscious of the dangers involved. For this reason, he does not like to have married men with families driving for him, nor does he like to use one of his employees.

As far as the future is concerned, the prospects are rosy. Continuing development work will be carried out on the Genie, a lot of time will be devoted to the Indianapolis project and, meanwhile, the normal routine of race preparation and the manufacture of speed equipment will continue. Space has already become a problem in the shop and, although there is work for another pair of hands, lack of space prohibits hiring another man. A move to bigger premises will have to be made soon, and when this comes about Huffaker plans to reorganize so that the frame shop is separated from the engine shop.

Although the Competition Department at British Motor Car Distributors in San Francisco is sometimes referred to as "Kjell Qvale's hobby shop," it is certainly not just a rich man's toy. This is proved by the racing successes it has enjoyed, and the number of people who have bought its products. Furthermore, it is no mean feat to take on Colin Chapman and John Cooper and sometimes beat them at their own game.

MK 2 Formula Junior used BMC A engine, coupled to a VW transmission incorporating special gears.