TESTS: NEW MG-B, 1963 AUSTIN-HEALEY, CARAVELLE S

NOVEMBER 1962
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ROAD & TRACK

ICD

THE MOTOR ENTHUSIASTS' MAGAZINE

COMPETITION: TOURIST TROPHY

SALON: PEGASO Z-102

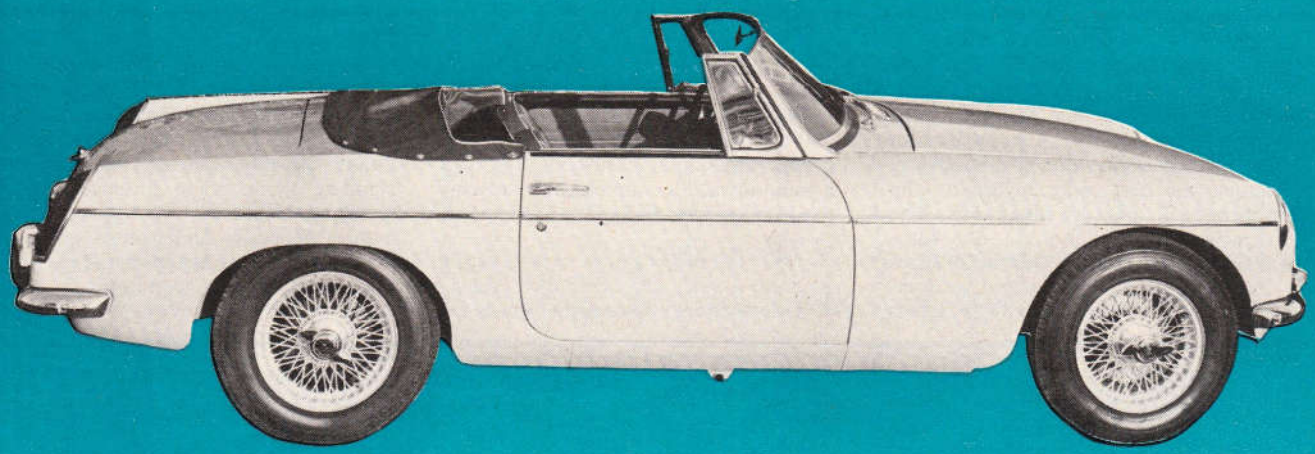
DRIVING THE EXPERIMENTAL CORVAIR SPRINT

THE NEW MG-B

FORD'S REAR-ENGINE SPORTS CAR

FORMULA I COOPER TECHNICAL REPORT & CUTAWAY DRAWING

Improvements in the Breed... MG for 1963



BMC makes spectacular advances on two fronts

IN NOVEMBER of 1955 the MG division of British Motors Corp. announced a completely new car, the MG-A. Only the TD-TF front suspension, slightly modified, carried over: the "A" had a new frame, new bodies, new engine, new transmission and new rear axle.

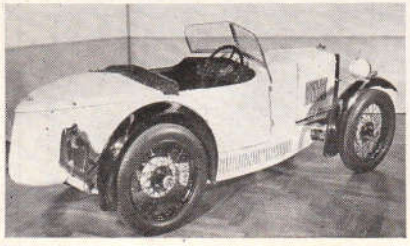
Now we have the MG-B-1800, replacing the MG-A-1600 Mark II. This time there is an all-new body, and with unit construction. Therefore, of course, no frame. Mechanical changes are minor; principally, the engine size has been increased from 1622 to 1798 cc, a gain of 11%.

It is interesting to note that the new MG-B is 3 in. shorter in wheelbase and overall length, and 2-in. wider than before. As a matter of fact, the box volume in cubic feet works out as exactly the same, at 262, while the frontal area is increased fractionally—by 2%.

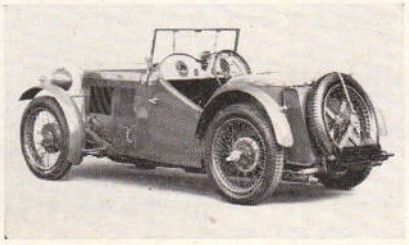
The tabulation shows that the change to unit construction hasn't saved any weight (weights are with full tank, disc wheels, no accessories). However, we must remember that the "B" has wind-up windows, a much roomier cockpit, etc. Also, the overall torsional rigidity is improved by unit construction and, though open-car cowl-shake was never a serious problem with the A, the net result is an even sturdier chassis, obtained with no increase in weight.

Unlike the Austin-Healey Sprite, which pioneered unit construction in BMC sports cars, the MG approach is entirely different. To explain a bit, the Sprite and its newer twin, the MG Midget, employ fairly simple flat section members wherever possible in order to simplify the tooling problem of (relatively) low volume production. But there is no sign of this type of economy in the MG-B. There are double rocker-panel sections under the doors. This member is straight and has overall dimensions of about 5.5-in. square—a generous size for what might be described as a frame rail. But in front there is a very elaborate sub-frame assembly designed to feed

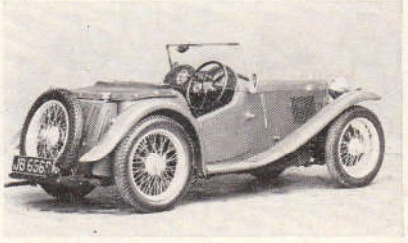
EVOLUTION OF THE MG



M, 1929–32



J2, 1932–34



PB, 1935–36

front suspension loads into the ample cowl structure.

A somewhat similar sub-frame provides the rear kick-up, and supports the luggage compartment and the rear bumper brackets. The tunnel structure which surrounds the transmission and propelled shaft acts as a central backbone and contributes to the overall strength and rigidity. Outside sheet metal, particularly the front and rear fenders, also is stressed and therefore contributes its share towards overall stiffness. This entire structure is all-steel, but the engine hood is aluminum because it is rather large and lifts up (from the front) without the aid of helper springs. The luggage lid, being small, is steel, as are the doors.

While the tooling cost for such a structure is obviously high, the ultra-modern styling would seem to assure the continuance of this model for several years—perhaps even for the 7-year duration of the MG-A. In any case, the price is expected to be little more than before.

Mechanically, there are few changes. But the designers have somehow found room for yet another increase in cylinder bore. Remember, the BMC "B-type" engine started out in 1948 with the Austin A-40 and a cylinder bore of only 2.58 in. (1200 cc). Late in 1955 the bore was increased to 2.875 in., giving 1489 cc. With this change the block was completely redesigned and all crankshaft bearings were enlarged in diameter. When the twin-cam engine came along, the bore was increased to 2.96875 in. (1588 cc) and, more important, the crankshaft was redesigned to give thicker crank checks—necessary with the horsepower jump to 108 at 6700 rpm.

Then, in 1961 the ohv B-block got another bore-increase, this time to an even 3 in. and 1622 cc. This engine produced 90 bhp and it got the sturdier crankshaft from the twin-cam powerplant. (The stroke of this engine was 3.50 in. from the very beginning, and still is in all applications of the unit.)

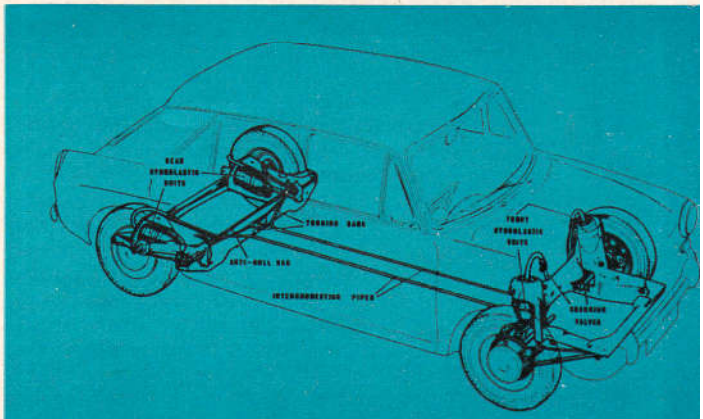
For 1963 the designers have miraculously achieved what must surely be the last and largest possible bore change—an increase of $\frac{5}{32}$ of an inch, or 3.15625 in. to be exact (MG rounds it off to 3.16 in.). This gives 109.5488 cu. in. or 1795.87 cc by our calculations, though the catalog says 1798 cc and the above assumption may not be correct down to the last decimal place.

Whenever you increase the cylinder bore of a basic block from 2.48 to 3.16 in., something has to give. Obviously the cylinder bores in the casting are siamesed in pairs. This simply means that there is no water space between cylinders 1 and 2, and between 3 and 4 (i.e., the space where there are no main bearings, below). But some 3 million Model A Fords were built in this fashion and they certainly enjoyed an excellent reputation. And that was before the advent of cam-ground pistons. This type of piston makes the siamesed cylinder bores even more practical though it may be significant that the compression ratio has been reduced slightly on the B.

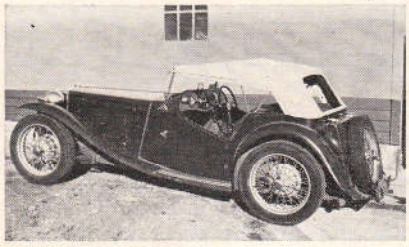
The transmission and rear axle are unchanged except that the synchro mechanism has been improved and the axle ratio has been dropped from 4.100 to 3.909:1. However, engine revolutions per mile are essentially the same as with the 1622-cc engine because 14-in. wheels replace the former 15-in. size.

There is an interesting change in the front suspension though essentially this assembly stems from the MG-Y sedan and the TD roadster of many years back. This i.f.s. scheme features a long steering-pivot with threaded bronze fittings on each end to allow steering movement. Suspension movement is obtained via cross-holes at 90° to the threaded axis—a sort of universal joint which has a great deal of merit and is still used on our Rambler. The upper bronze fitting on the MG-B is unchanged but the lower assembly has been redesigned

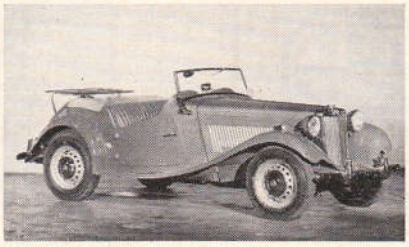
The advanced MG-1100.



A remarkably clever and effective suspension.



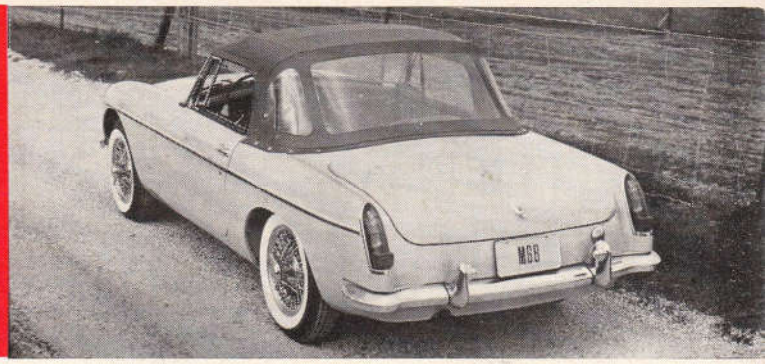
TA/TB/TC, 1936–49



TD, 1950–53

TF, 1953–55

Improvements in the Breed... MG for 1963



to give better ground clearance; a valuable improvement.

Further details on the new MG-B will be found in the road test beginning on page 26 of this issue.

The MG-1100 Sedan

Also new is an MG sedan from BMC, designed for the U.S. market. Essentially, this is an Americanized version of the Morris Minor 1100 announced recently in England.

What BMC's chief engineer, Alec Issigonis, has done is to merely take his successful formula for the ADO-15 (code name for the Austin 850 and Mini-Minor) and scale it up. ADO-16, or the Morris Minor-1100, becomes the MG-1100 for export to America. This export version differs from the Morris in that it has higher horsepower, more luxurious interiors and, of course, an MG grille and name plate.

ADO-16 is not a car that can be ignored. While the smaller ADO-15 hasn't had much of a reception in the form of sales in this country, the new 1100 is something entirely different.

Here is one of the most clever, astute, interesting and practical new cars ever announced. It is still small (just over 12 ft long) and photos are deceptive in that they tend to make the car look larger than it actually is. The respected firm of Pininfarina is responsible for the styling and, considering the fact that they were handed a box with a snub-nose for the engine compartment, the job is very well done.

As a matter of fact, it is the sensible, practical package design which intrigues us even more than the engineering features—the latter being, as might be expected, a further development of the Mini. The seats are designed to seat two in front and three in the rear with a little squeezing. If we take the dimension from the pedals to the top of the back seat (parallel to the ground) it measures a very generous 75 in., or 80% of the wheelbase. Nothing is skimped or squeezed; there is ample leg room in front and knee room at the rear, even for over-six-footers. Efficient space utilization is also well illustrated by the overall length of only 146.8 in. with very moderate overhang at each end. Yet the luggage space at 9.5 cu ft is generous. In essence this seating package is approximately the equal of the average 1500–1600 cc car, yet the overall size and weight have been kept so low that an economical 1100-cc engine gives approximately the same acceleration and top speed as a more powerful vehicle.

One reason for the extra interior room can be found by examining the doors. The window glass is curved—this allows thinner doors and particularly enhances shoulder room, where about 2.5 in. of extra width is secured by this means alone. The rear seat hip room is 52 in., wider than the track and equal to 86% of the overall vehicle width.

Now for the mechanical features. First, it is not correct to say that the MG-1100 sedan is nothing but a larger Mini. While it does have a transverse engine, front wheel drive and rubber suspension, the only parts in common are most of the gearbox, the i.f.s. ball joints and the steering rack.

Without a doubt, the most interesting new development found on ADO-16 is "Hydrolastic" independent suspension at all 4 wheels. While design work on the actual car began 3½ years ago, the suspension development work began in 1955! Briefly, the rubber cone springs are of the same general type used for 3 years in ADO-15 but with an additional feature. A mixture of water and alcohol is contained in each rubber cone and a flexible hose provides an inter-connection from front to rear, but not from side to side. The reasons for this, and the results, are substantally identical to those found necessary on the big Citroens, the spring-loaded fore and aft mechanical hook-up used on the Citroen 2-CV and the torsion-bar Packard arrangement. When a front wheel hits a bump and moves up, the fluid pressure increases and, because of the hose-line, the rear end of the car raises a fraction of a second later, and not quite so far as in front. When the rear wheel reaches the obstruction, the front end of the car reacts in the same fashion. Obviously, this reduces the tendency of a short car to pitch, fore and aft. But there's much more to it than that. First, the rubber suspension alone gives a very desirable variable rate, soft for a good boulevard ride, firmer as the wheel moves up toward the bump stops. But the hydraulic feature allows still lower (softer) ride rates because cornering roll is reduced—even though there are no transverse connections! In a corner the two outside wheels get more than their normal share of the load and because they are connected, hydraulically, the initial tendency to roll raises the pressure on the spring cones and gives the effect of stiffer springs, temporarily and just when needed. Thus the ADO-16 has relatively soft suspension with no pitching tendency and almost no roll. This system also allows a very simple damping action via in-built rubber valves. No shock absorbers are necessary.

The designers of ADO-16 have chosen excellent handling as their goal rather than going all-out for a soft ride. The true measure of ride softness is not ride-rate but bounce-frequency. This frequency is given as 97 per minute, which is very high by U.S. standards where 75 is typical and some cars are approaching 60 per minute. The ADO-16 ride will be firm, and MG sports car owners should love this new 1100 sedan.

MG-A, 1955–62

The ADO-16 designers also wanted neutral steering, to make this car the fastest sedan in the world—around a corner. The Mini, with its preponderance of weight on the front wheels and f.w.d., is a strong under-steerer. To avoid this limitation, the ADO-16 has an anti-roll bar at the rear only. This and more weight on the rear tires (but still under 50% of the total) tends toward oversteer and the result is a car which is said to be as near neutral steering as any you can find. Front tire wear rate is also more normal with this design.

The tires, incidentally, are a new size, 5.50-12. And the larger wheels are also more deeply dished, so that they now have true center-point steering. This tire size compares to the 5.20-10 roller-skates used on the ADO-15 and 6.00-13 used on the lightest American car (2500 lb). Disc/drum brakes are used and they are 1-in. larger than on the Mini-Cooper.

Although the 1100-cc engine stems from the "A" series units first used in the Austin A-35, there are very few parts in common with the current variants. The cylinder bore is 2.542 in., the same as used on the 995-cc Mini-Cooper and larger than found in the 948-cc Sprite engine. At 3.296 in., the stroke is the longest yet used in this basic unit and both the cylinder block and crankshaft are completely new. The new crank has thicker checks and narrower bearings to improve rigidity. It also has a harmonic crankshaft balancer for quietness and further insurance. The bearing shells are lined with lead-indium (instead of babbitt) and the wrist pins float instead of being pinched by a bolt in the rod.

The cylinder head is not new—it is the same as used on the Cooper, Midget and Sprite engines. This uses larger 1.156-in. intake valves but standard 1.0-in. exhausts. While the Morris 1100 has one carburetor and develops 50 bhp gross, the MG-1100 version will have two SU carburetors and a rating of 60 bhp.

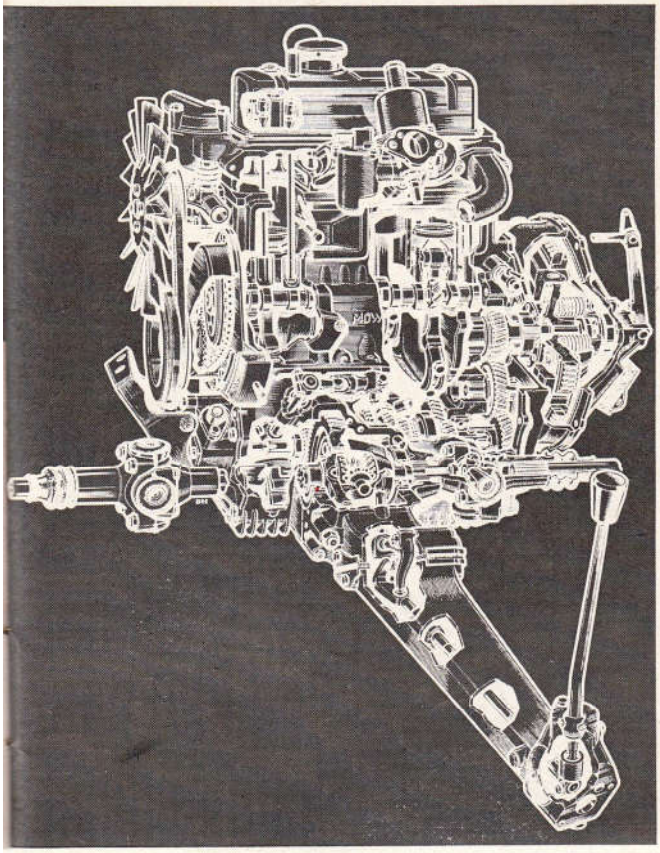
A unique switch is bolted-on to the oil-filter mounting. The filter is the full-flow type and if it becomes clogged a by-pass valve opens at 12–14 psi. The switch is actuated when the differential pressure reaches 7/9 psi: i.e., some time before clogging of the filter element. The switch, in turn, activates a green light on the instrument panel. Extensive test experience with this warning light shows that it will indicate "time to change" at very close to 6000-mile intervals, exactly as recommended.

A 7.125-in. clutch is continued but with heavier springs to take the higher torque. There are a number of changes in the transmission. The baulking-type synchronizers are of a new design (1st is non-synchro) and this and special surface treatments for certain sliding parts make shifting gears much easier, even when the car is new. Gear ratios in the box are unchanged but overall ratios have been adjusted to compensate for the larger tires. These are 4.133, 5.837, 8.976 and 14.993.

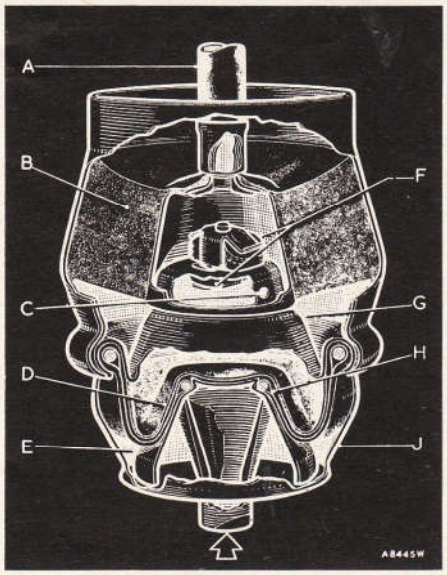
Service and maintenance are at an absolute minimum. The unique rubber-water suspension is completely sealed and the only lubrication required is for the 4 ball joints of the i.f.s.—once every 3000 miles. The radiator is sealed and is good for 2 years before draining.

Performance of the MG-1100 was quoted to us as 0 to 60 in 21 sec, 0–70 in 31, cruise at 70 mph (4650 rpm) and a top speed of about 82 mph. These figures seem conservative, as British tests for top speed show 76–78 mph for the 50-bhp Morris model.

This very advanced economy-type car will soon be available in the United States. No prices have been announced but it should be close to $2000. We look forward to driving one for the first time. In spite of the success of MG sports cars in the U.S., this company's sedans have never caught on. Perhaps this new car will turn the trick—at any rate it is one of the most interesting family car solutions we've ever seen.

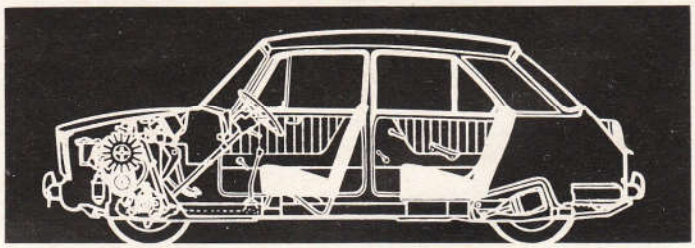


The ADO 16 power unit and transmission, which (with two carburetors) propels the MG-1100.



The Hydrolastic unit's elements are: A. Interconnecting pipe; B. Rubber spring; C. Damper bleed; D. Butyl liner; E. Taper piston; F. Damper valves; G. Fluid separating member; H. Rubber and nylon diaphragm; J. Taper cylinder.

No space is wasted in the MG-1100 sedan.



Civilization has come to Abingdon-on-Thames

THE LOUDEST WAILS in the land were heard back in 1955 when MG made two shattering announcements: 1) the semi-classic TF was being dropped in favor of aerodynamics, and 2) the sturdy XPEG engine was to be replaced by an Austin "B" type. The body change was inevitable and was expected, we think, by most MG owners.

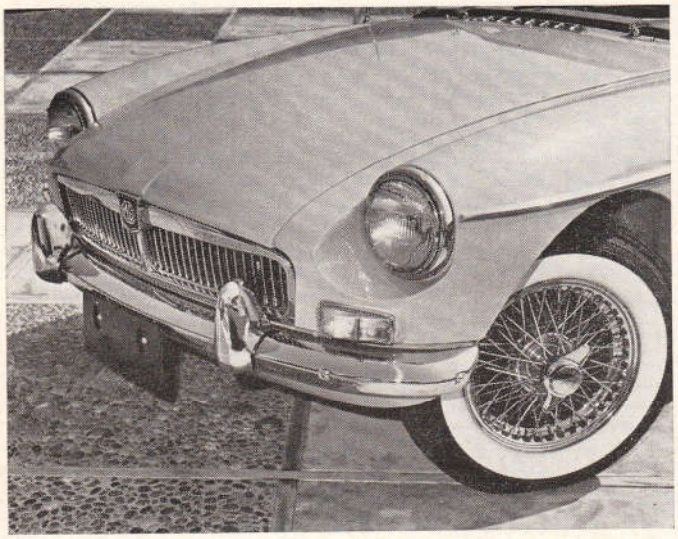
But for 7 years the streamlined MG-A consistently broke all previous sales records and proved in competition that it was faster and at least as durable as any of the good old T-series.

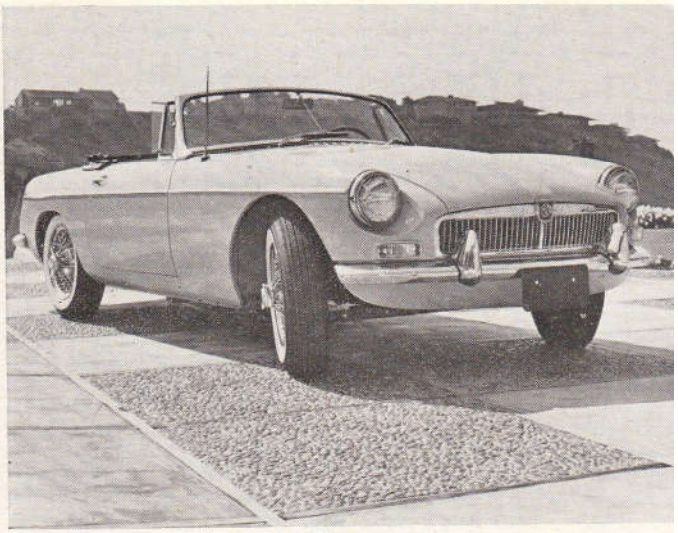
The new "B" isn't quite as much of a change as the "A" and no wails have been heard around our office. Our styling experts (who really are) never had much good to say about the lines of the A. It was "corny, out-of-date in 1955, had poor surface development, etc." But there's no complaint over the fresh new look for the B. The worst we heard was that it's good but not very advanced or exciting. Perhaps this is true if you're comparing it to, say, an Avanti, but everyone on our staff was enthusiastic over the appearance of the B, consultants notwithstanding.

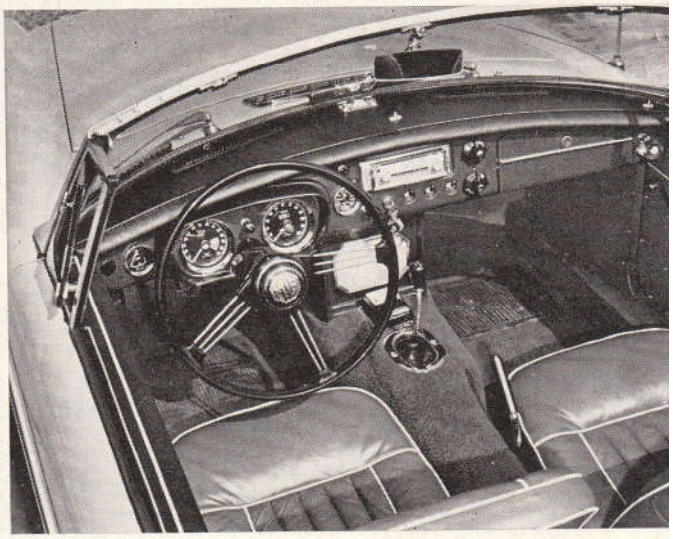
Our enthusiasm did not wane during 700 miles of driving. In fact, it grew stronger, and frankly this is the first British car in several years which created no arguments among the staff—even the Italian and German sports car owners forgot their private battle and admitted they liked to drive this new English job.

The ride seems to be unchanged and this is both a fault and a virtue. There's no doubt about it, the ride begins to feel firm after an hour or two, yet it is this taut feel which gives the car its typical good handling in sharp corners or in fast bends. The steering characteristic is very close to being neutral at all times and when we weighed the car with full tank and driver aboard we found out why. The front wheels carried 1130 lb, the rears carried 1130 lb. (Actual curb weight was 2080 lb with wire wheels and radio.) The steering ratio is just a fraction slower and, we think, the better for it. The feel was a little less trigger-happy and more relaxing at high speed (2.9 turns lock to lock; formerly 2.6).

The larger 1796-cc engine feels happier too. Though the axle ratio has been dropped from 4.100 to 3.909 the new 14-in.







wheels negate any effect and 3340 engine revs are churning at 60 mph. Still, the engine seems smoother and quieter than the 1622-cc unit we tested two years ago. Part of this improvement may be attributable to the slightly lower compression ratio but we believe more efficient silencing is a more important factor. The 4 cylinders run like clockwork up to about 4000 rpm—above that there is a harsher note—but no vibration all the way up to the red line at 5500 rpm.

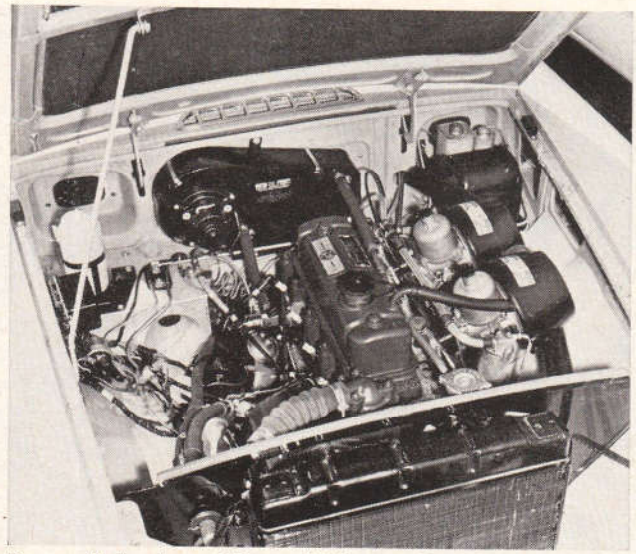
Performance recorded during the acceleration tests needs no apology—the B goes fractionally better than the A Mark II but there are only 4 more horses and the larger engine is obviously detuned slightly because an 11% increase in piston displacement gives only 4.5% more power. This may also be a factor in the smoother running mentioned earlier.

Incidentally, during the test runs it was very hot and the engine was barely broken in. We used 5500–5600 rpm as an absolute limit though 6000 can be used occasionally and such a speed would probably knock a tenth or two off the times we recorded. At any rate, and despite the above, the engine temperature never went above 170° F and at steady cruising the needle held 160–165° F, during both day and night.

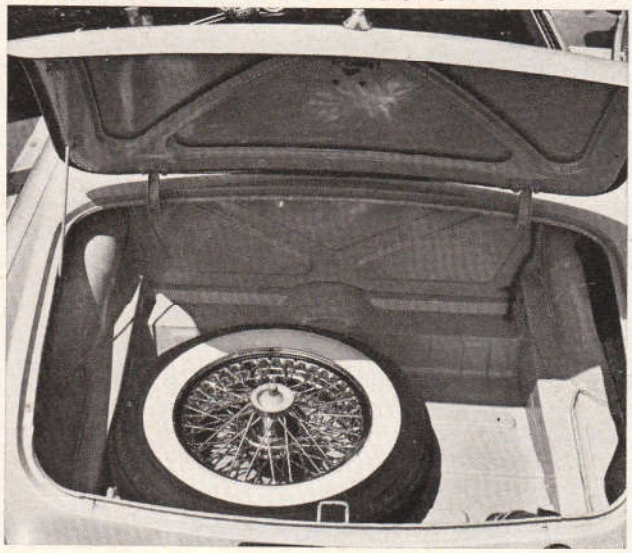
Fuel consumption worked out at 24 mpg around town and averaged 27 mpg on one 300-mile trip—a trip that was about evenly divided between slow traffic and fast freeway driving.

A big improvement was noted in the transmission. The A-types had good but rather stubborn synchronizers. The B, even with very few miles on it, shifted perfectly and noticeably easier. The shift lever seems to be a little higher than before—or actually the seats are just a little lower. A really worthwhile cockpit change comes via the new unit-construction which dispenses with the frame. There is, at last, ample pedal spacing for the average American shoe (foot?). The clutch and brake pedal pads are a little small (1.75 in. wide) but are spaced on 4.7-in. centers. Biggest improvement is accelerator pedal room—the space between the tunnel and the edge of the brake pad measures 6.1 in. The pedals didn't satisfy some of our drivers; either the brake was too high or the accelerator too low; in any case it was impossible to heel-and-toe, which is unfortunate but could easily be corrected.

The disc/drum brakes were absolutely without fault and despite



Removable hardtop will be available soon. Dished floor would allow inversion of spare, increasing luggage space.



MG-B 1800

there being no booster the pedal pressure was very moderate. Furthermore, there were no signs of some of the faults we often encounter. The action was progressive and produced no lurching as the car came to a dead stop. Of course, there is no fade either and we were surprised at finding none of the disc brake squeal which is all too common. The handbrake was adequate though it has a very short travel.

The instruments look to be the same but there is a cowl over the speedo and tach. The seats are now much better contoured and we got a surprise when we moved them all the way back. An average-height driver couldn't reach the pedals at all from this position and the critical pedal to seat back dimension is the longest we've ever encountered: 45.0 in. to the last hole setting and an inch more available past the last latching point. Two 6 ft 4 types did not need the seat all the way back and they still had headroom. Behind the seats is a carpeted shelf upon which an average size adult or two children can perch without too much discomfort.

The new doors measure 36.5 in. wide, making it easier to get into the car. The top isn't quite so convenient. It folds neatly and flush into the well but the number of hinge points and top bows is confusing and it's easy to get pinched in the process. The wind-up windows (for the first time) are a great boon. They fit well, crank up or down with just over 2 turns and had a tendency to rattle on rough roads.

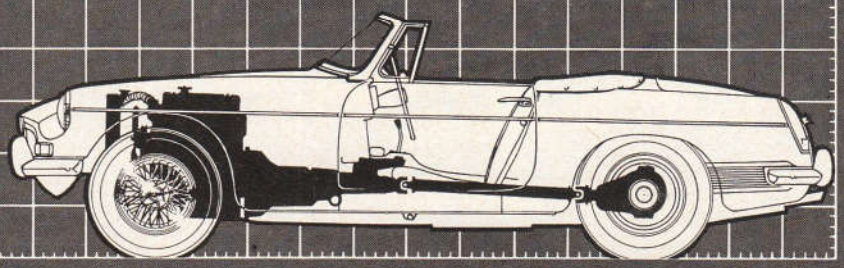
Our test car had a heater but there was no opportunity to use it. We were impressed with its neat and accessible installation with the business part on a shelf just behind the engine. The entire engine compartment is also well planned and the only tight spot we could find was the steering shaft coupling (at the pinion) where dual exhaust pipes, engine mounts, etc., preclude even finding it—let alone working on it.

Moving back to the rear, the higher rear fenders should give more trunk space, but volume is still skimpy and marred by the spare wheel and tire being smack in the middle. Our thinking is that the gas tank really should go somewhere else (maybe in the fender skirts like a Jaguar Mk X) and at least the wire wheel could be flopped over for more room.

Our test car was a very early production model and yet, when we went over every square inch, the quality of workmanship and lack of flaws were remarkable. This is the best engineered, the best put-together MG we've ever seen.

ROAD TEST

MG-B 1800



SCALE: 10" DIVISIONS

DIMENSIONS

Wheelbase, in.	91.0
Tread, f and r	49.2
Over-all length, in.	153.2
width	59.9
height	49.4
equivalent vol, cu ft.	262
Frontal area, sq ft.	16.4
Ground clearance, in.	4.2
Steering ratio, o/a	n.a.
turns, lock to lock	2.9
turning circle, ft.	32.0
Hip room, front	2 x 18.5
Hip room, rear	n.a.
Pedal to seat back	45.0
Floor to ground	9.1

CALCULATED DATA

Lb/hp (test wt)	25.6
Cu ft/ton mile	88.4
Mph/1000 rpm (4th)	17.9
Engine revs/mile	3340
Piston travel, ft/mile	1950
Rpm @ 2500 ft/min	4290
equivalent mph	77.0
R&T wear index	65.1

SPECIFICATIONS

List price	n.a.
Curb weight, lb	2080
Test weight	2400
distribution, %	50/50
Tire size	5.60-14
Brake swept area	350
Engine type	4-cyl, ohv
Bore & stroke	3.16 x 3.50
Displacement, cc	1796
cu in	109.6
Compression ratio	8.75
Bhp @ rpm	94 @ 5500
equivalent mph	99
Torque, lb-ft	107 @ 3500
equivalent mph	62.8

GEAR RATIOS

4th (1.00)	3.91
3rd (1.37)	5.37
2nd (2.21)	8.66
1st (3.64)	14.2

SPEEDOMETER ERROR

30 mph	actual, 29.8
60 mph	58.5

PERFORMANCE

Top speed (5900), mph.	106
best timed run	n.a.
3rd (5600)	73
2nd (5650)	46
1st (5650)	28

FUEL CONSUMPTION

Normal range, mpg	24/29

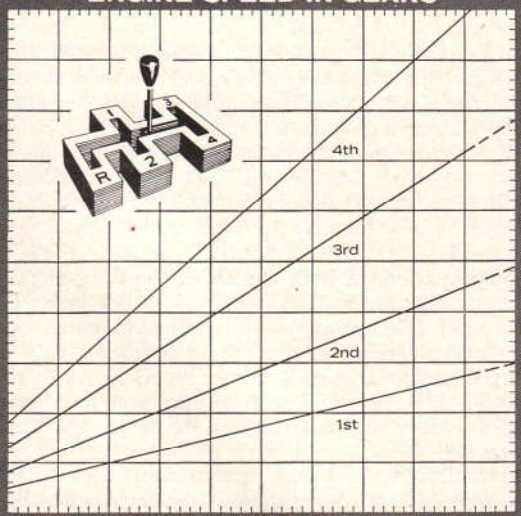
ACCELERATION

0-30 mph, sec.	3.9
0-40	5.9
0-50	9.0
0-60	12.5
0-70	17.7
0-80	25.0
0-90	34.5
Standing ¼ mile	18.5
speed at end	72

TAPLEY DATA

4th, lb/ton @ mph	210 @ 58
3rd	300 @ 48
2nd	450 @ 35
Total drag at 60 mph, lb.	105

ENGINE SPEED IN GEARS



ACCELERATION & COASTING