MG-1100

Watch out, Wolfsburg, here's a new one out to pass you in your sales curve's corners

"THIS," said the man showing us to our test car, "is the car that is going to clean Volkswagen out of this market." Said with a straight face by an executive for the importer of the MG-1100 sedan, the statement carried the weight of company policy. Therefore, we felt this challenger had a lot to live up to in matching the well known capabilities of Wolfsburg's waterless wonder.

Then, a funny thing happened on the way to the road test . . . we grew quite fond of this small car with the big interior. Why is it that the "silly little cars" are oftimes the most fun? Driving the MG-1100 constantly reminded us of the delights of driving some of the early (before soft suspensions) VWs to hit these shores.

Contrary to a trend in recent European small car design, MG keeps its 4-cyl. inline engine in front. It is, however, mounted transversely across the chassis and incorporates the 4-speed gearbox in the oil sump below the crankshaft. And it drives the front pair of smallish, 12-in. wheels.

This design, developed by Alec Issigonis, technical director for British Motor Corp., first appeared as the Mini-Minor and Austin 850. The concept is a good deal expanded upon for the MG-1100 (as well as the near-identical Morris 1100), and is an effective example of the alternative to the rear-engine, rear-drive layout illustrated by VW, Renault, etc., for providing maximum passenger space in the minimum room.

An overflow of engineering innovations are incorporated in the car, and yet we found it almost entirely debugged. Basic design simplicity (although at first glance it appears rather complex) and prior proving out with the Minis are probably the primary reason for this.

Perhaps the most interesting of these innovations is the Hydrolastic suspension system, developed and patented by Moulton Developments Ltd., in cooperation with BMC. This system eliminates steel as a suspension medium and carries the use of rubber to a new level. The suspension units are basically glorified shock absorbers, interconnected between front and rear on each side, which have the appearance of miniature butter churns. A near half-and-half mixture of water and alcohol (with a dash of distasteful dye to satisfy customs and discourage tipplers) is used to transfer the car's weight to the main rubber suspension components and to act as the damping (no pun intended) medium.

Tapered pistons, connected to the corresponding suspension arm, move a rolling rubber diaphragm in the bottom of the Hydrolastic unit's metal case. This flexible diaphragm, nylon reinforced and lined with butyl inside where it contacts the working fluid, puts the pressure on the fluid in the lower portion of the unit. This forces

the fluid through flexible rubber flap valves located in the unit's central divider, to the upper chamber where it acts against a circular rubber doughnut "spring" at the top of the unit. During rebound, the fluid's forces are reversed and effectively keep the wheel in continual rolling contact with the ground.

By connecting front and rear units on each side by small diameter tubes for the fluid, a great degree of pitch control is maintained. As front wheels hit a bump, fluid is forced to the rear units to "raise" that end in anticipation of the bump. In addition, the interconnection puts the outer wheels in dynamic balance during cornering, thereby increasing adhesion.

Fluid is displaced in greater volume than that caused by the linear stroke of the piston by virtue of the shapes of both the piston and the rubber spring. With the mechanical geometry of the suspension, this gives what is in effect a variable rate suspension system. Combining the front-rear interconnection with the variable rate results in a theoretically "shorter wheelbase" for pitch conditions. During cornering, the opposed fluid forces support the rising rate of the rubber springs and increase roll stiffness. All of these factors also add up to another feature: the car's attitude is little affected by widely varying loads which might be carried.

The hydraulic circuit is self-contained and factory sealed at a pressure of 275 psi. Provision has been made for dealers to service the units with special equipment, if the need should arise, but a hydraulic breakdown won't put the car completely out of action. It can be driven to the shop at slow speeds suspended on the bump stops.

To complete the necessary pitch and roll control requirements, a pair of steel torsion bars connect the rear trailing arms to the chassis for stiffening and an anti-roll bar connects the two arms to reduce roll understeer. Suspension components, both front and rear, are built up as sub-frames which attach to the car's unitized body at five semi-shear type, rubber-padded mounting points on each.

Use of water as the damping medium, it might be mentioned, results in more constant viscosity (than oil) throughout the temperature ranges likely to be encountered and provides better heat dissipation for a hard-working suspension. The alcohol in the fluid functions only as an anti-freeze.

The bump-sopping capacity of this suspension, we discovered, borders on the fantastic. Over any irregular road surface at virtually any speed, the 1100 carries its passengers along with the minimum of discomfort. The occupants are aware that the wheels are going through a lot of gyrations, but the jolts and jars rarely get past the water and rubber barrier. Body lean during cornering is negligible, but centrifugal force will gently slide the rear passengers across the somewhat slick seats.

Changes have been made in the front end geometry from that of the Minis to provide more inherent stability and to limit the change from under- to over-steer when backing off the throttle during cornering. These include a 6° caster angle, a 10° swivel pin angle, deeper dished wheels and a slight toe-out for the rear wheels. The rack and pinion steering assembly is attached to trailing steering arms and a road shock damper is incorporated.

Unequal length arms locate the front wheels, with a small torque rod from the lower arm fastened forward to the sub frame and making, in effect, a wide-base wishbone. The suspension canister is mounted above and connected to the upper arm near the inner pivot point. Inner universal joints have bonded rubber bushings for cushioning while constant velocity universal joints with sliding splines are fitted at the wheel ends of the half-shafts.

Most drivers are unaware of the ▶

DARKER DASH wood is fitted to later instrument panels.

TRANSVERSE ENGINE has radiator exhausting air into fender.

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front-wheel-drive in the 1100, so effectively have the design goals been met. The steering wheel does shake when the hands are momentarily lifted at speed, but the vibration isn't noticeable when the wheel is gripped. The car is so neutral in handling that most of the time you just steer and drive, with little thought to cornering technique. Its basic understeering nature is apparent only at slow speeds when the weight of that mass of machinery over the front wheels can be felt in the steering.

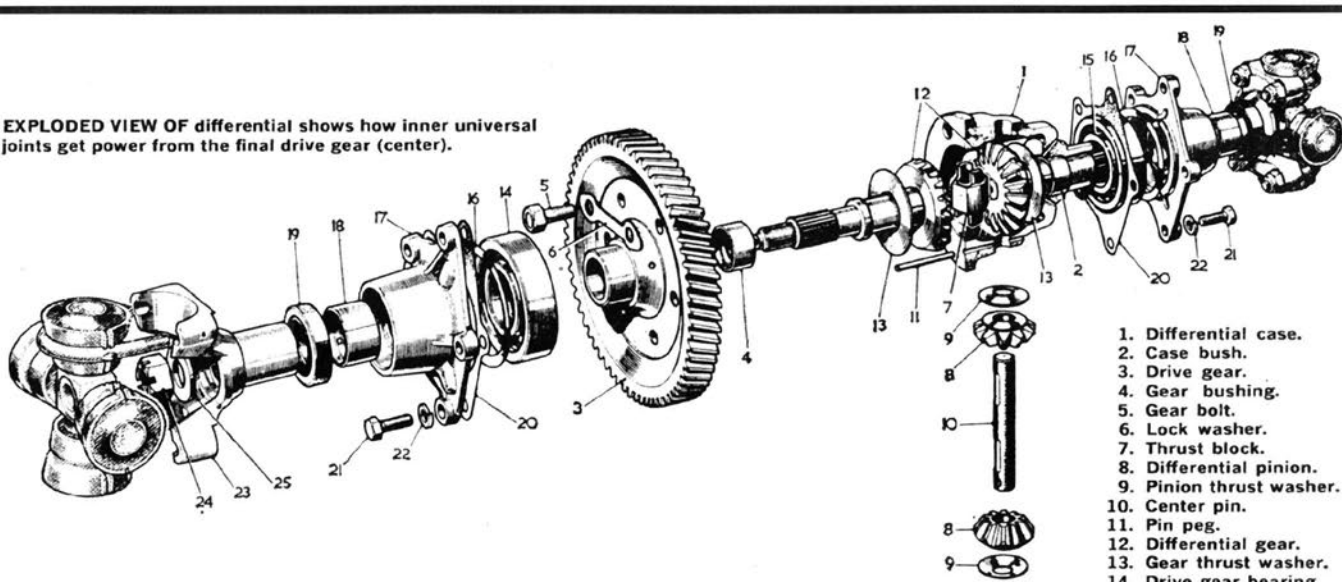
The front-wheel-drive is detected only during brisk acceleration through the gears or in climbing hills. In these situations, there is the definite impression of being pulled along, rather than propelled. Flexibility in the gearshift lever mounting causes the stick to twist slightly from torque forces building in the engine, and this heightens the pulling effect.

The 1100 uses the BMC A-block engine, bored out and stroked to just about its limit. The same block is used in the Minis, Austin-Healey Sprite, and MG Midget, although it is in its most powerful form in the 1100. In "standard" form for the Mini, it develops 37 bhp from 51.7 cu. in. (2.48 x 2.69 bore and stroke). In the twin carburetor Sprite version, stroking to 3.0 in. increases capacity to 57.8 cu. in. and bhp to 50. For the 1100, stroke is lengthened another 0.3 in. and the bores are increased to 2.54 in. for the 67-cu. in. capacity. A pair of SU HS-2 carburetors supplies the fuel mixture.

The transverse mounting of the engine under the hood places the radiator on the left, where it is well shrouded into the fender well. A 16-blade fan expels engine heat out through the radiator onto the road behind the front wheel. An expansion tank is incorporated into the cooling system. All ignition wiring and the spark plugs are on the front side of the engine, where they are readily reachable for periodic service. Although there is little splash protection given by the grille, waterproofing is such that the engine never missed a beat even during quite heavy rains that fell while we had the car.

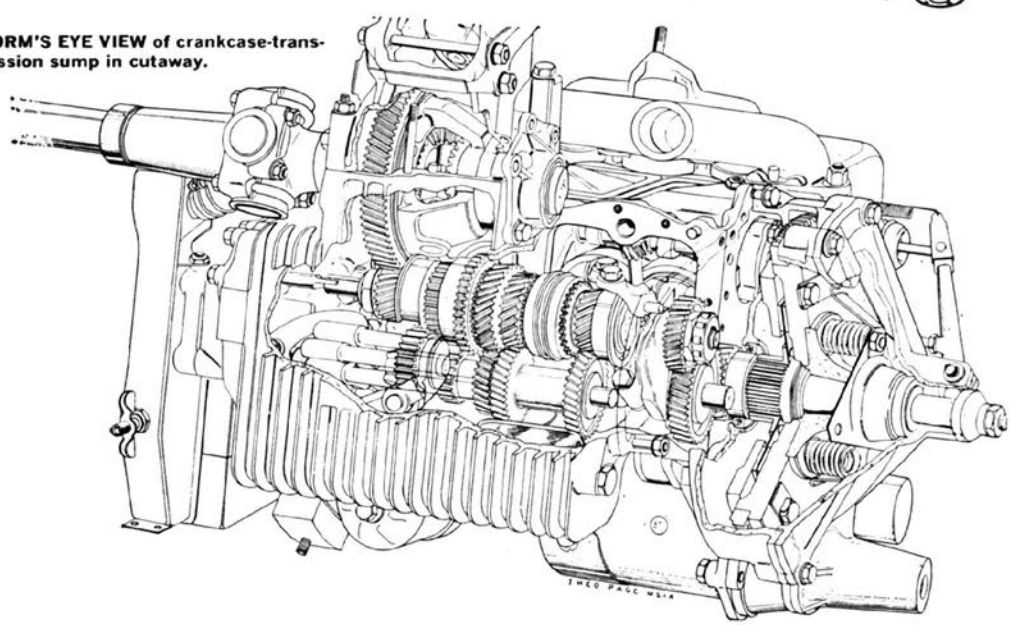
Intake and exhaust manifolding is all on the firewall side of the engine, and the carburetor mounting angles upward enough to permit fairly easy

EXPLODED VIEW OF differential shows how inner universal joints get power from the final drive gear (center).



1. Differential case.
2. Case bush.
3. Drive gear.
4. Gear bushing.
5. Gear bolt.
6. Lock washer.
7. Thrust block.
8. Differential pinion.
9. Pinion thrust washer.
10. Center pin.
11. Pin peg.
12. Differential gear.
13. Gear thrust washer.
14. Drive gear bearing.
15. Case bearing.
16. Bearing shim.
17. End cover.
18. Cover bushing.
19. Oil seal.
20. Cover joint.
21. End cover screw.
22. Washer.
23. Driving flange.
24. Flange nut.
25. Washer.

WORM'S EYE VIEW of crankcase-transmission sump in cutaway.



THE GEAR and final driveshafts have axes in the same plane as the half-shafts that drive the front wheels. They are driven via an intermediate gear from a crankshaft mounted above them.

servicing of these—an excellent idea in view of the SU tendency to need attention. The battery is mounted forward over the right tire. Hydraulic reservoirs for the brakes and clutch are mounted on the firewall within easy reach.

The drive train is taken through a 7.25-in. hydraulically operated single dry plate clutch, mounted outboard of the cantilevered flywheel. This location, it might be noted, makes it easy to service the clutch without disturbing the rest of the transmission parts. A torsional vibration damper is fitted to the crankshaft to increase smoothness, in compensation for the overhung location of the flywheel.

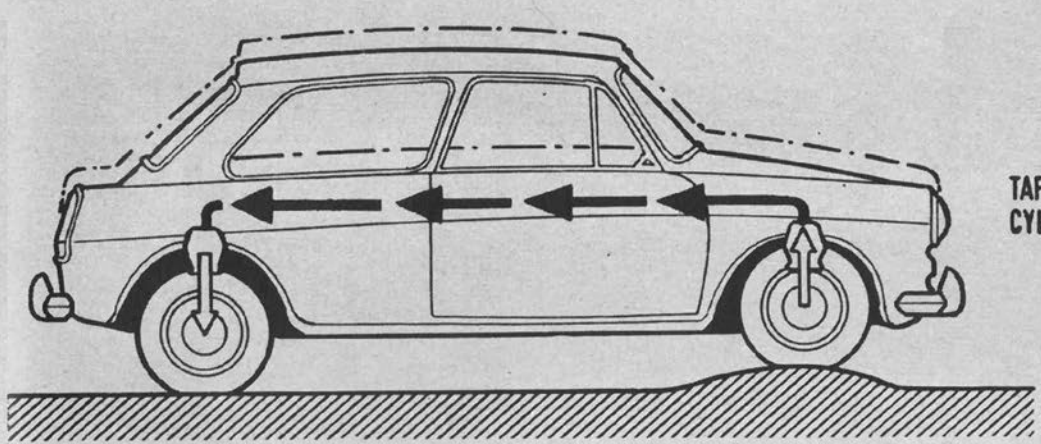
From a primary gear on the crankshaft, the drive is taken through an idler gear to a 24-tooth gear on the end of the first shaft of the normal gear cluster. A helical spur pinion on the end of the third motion shaft meshes with the gear connected to the differential bevel pinions and exposed driveshafts take it from there to the front wheels. A newly developed balkring type of synchromesh, which has lighter operating loads than earlier synchro-rings, improves shifting ease on the top three gears. While the transmission is completely foolproof on these gears, low is still, unfortunately, unsynchronized.

The floor shift lever, in addition, follows a pattern that is angled slightly to the left and missed shifts can be a definite problem until the driver gets fairly well acquainted with the car. During acceleration tests, the snap shift from 2nd to 3rd as often as not went up the blind gate for reverse; to avoid that, a definite guiding pressure was used on the shift lever, but the shift clashed its way back into 1st gear instead. Yet, in slightly less "all-out" driving situations, shifting is as effortless as any we've ever tried. The lever stands tall beside the driver's knee and shifts are accomplished in a finger flick.

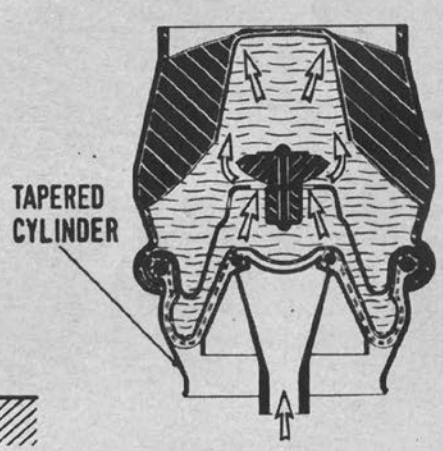
The engine-drive combination, we found, was more than adequate. Final drive ratio is 4.13:1, compared with the 3.77:1 installed on the Minis. This change was made to compensate for the larger wheels and tires, thereby keeping the mph/1000 rpm figure the same (15.0). Acceleration was certainly brisk enough with this gearing and, so long as there was traction for the front wheels, there wasn't a grade which the car didn't master. Open highway speeds of 75 mph were easily maintained, although accompanied by a quickly tiresome engine roar drumming off the broad flat roof (despite padded insulation behind the headliner).

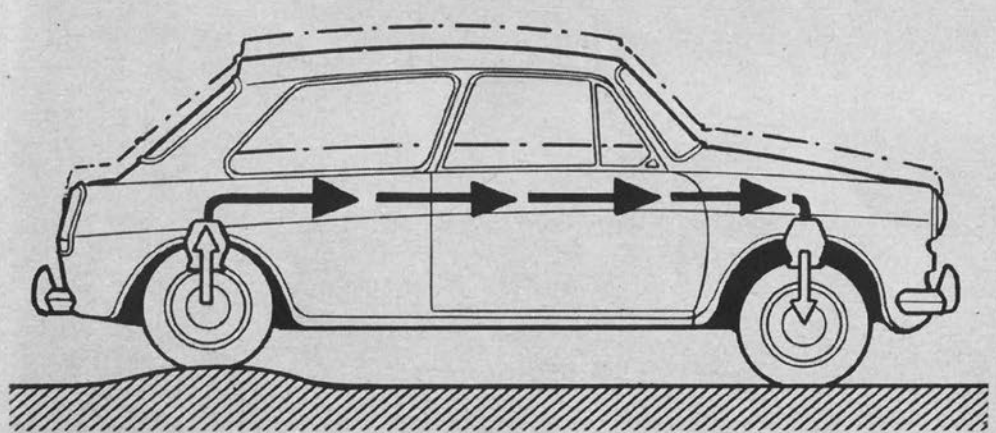
This is the one area where we questioned the 1100 design. Had BMC retained the Mini final drive, the engine would have worked somewhat less hard at highway speeds and longevity would ▶

ACTION OF HYDROLASTIC suspension is shown in simplified diagram showing response to pitch and bounce. Cross-section of suspension canister depicts fluid's reaction to wheel jolts.

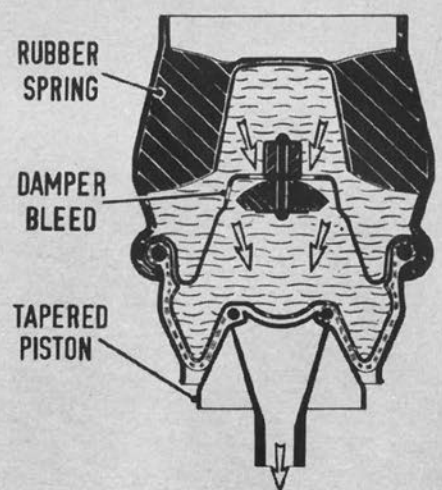


TAIL RISES IN RESPONSE TO UPWARD MOTION OF FRONT WHEELS





NOSE RISES IN RESPONSE TO UPWARD MOTION OF REAR WHEELS



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have benefitted. Acceleration would hardly have been affected, since the lower (numerical) gearing could make better use of the 2400 rpm torque peak. Fewer engine revs per highway mile would also reduce the operating roar to a more liveable hum.

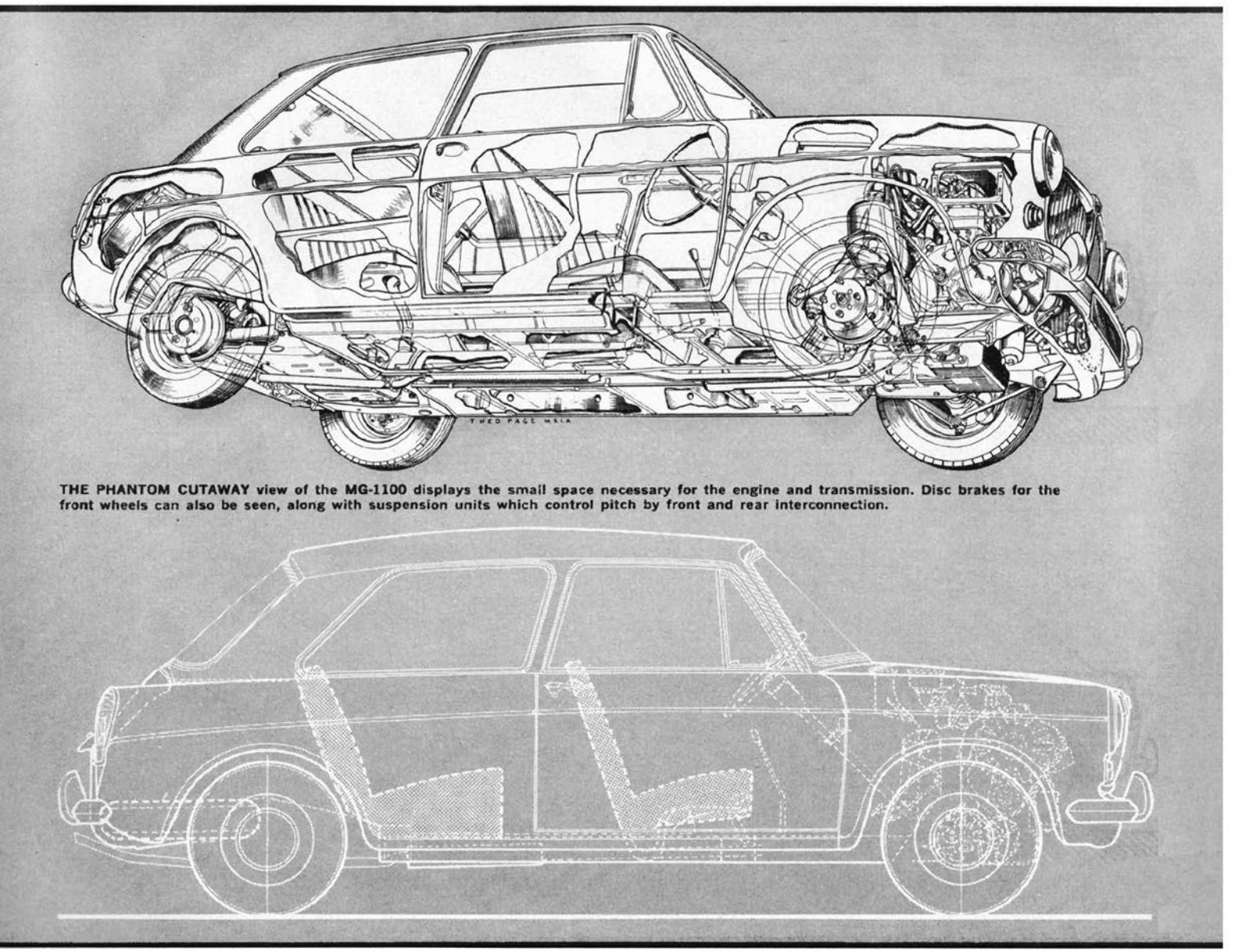
It might be noted here that the VW, which this car is challenging, has a final drive that permits 18.7 mph/1000 rpm and much more pleasant highway speeds. This is coupled with an easy-going square engine design that pushes pistons only 1340 ft./mi. (compared to the tightly-wound MG engine figure of 2200). The ideal is somewhere between these two extremes, where long grades won't haul down the cruising speed, yet engine revolutions are more reasonable.

Despite itself, the BMC engine has a history of good reliability and our concern may be academic. It does provide 15 more bhp (than VW) for the 119-lb. heavier 1100 for a 31.1 lb./bhp ratio, compared to the competitor's 50.8. This is in an up-to-date Pininfarina-styled package that also has space advantages over the Wolfsburg product.

Wheelbase on the MG is 1 in. shorter and overall length is 13.3 in. less. It is 6.4 in. lower, although tread and width are within tenths of inches of VW measurements. Frontal area is 1.9 cu. ft. less and turning circle (in spite of front-wheel-drive) is reduced 1.8 ft. Yet, in this smaller package, there is still 2 in. greater leg room in front, 2 in. wider front seats and 2 in. greater knee room in the back seat. Usable rear seat width, however, is 2 in. less because of the intrusion of arm rests jutting over the cushion.

There is also an advantage in luggage space, with a trunk measuring 32 in. deep, 42 in. wide and 14 in. high in the MG. But where the biggest difference will be felt, as far as most buyers are concerned, is in price. The VW has an advantage of at least $248, in spite of the MG pricing of $1898, regardless of port of entry.

Close examination of the interior of our test car once again emphasized the fact that British trimwork leaves something to be desired, at least in mass-produced cars. Poor glue, an almost typical BMC characteristic, was evident where the vinyl trim was attached to metal. Gaps were evident in



THE PHANTOM CUTAWAY view of the MG-1100 displays the small space necessary for the engine and transmission. Disc brakes for the front wheels can also be seen, along with suspension units which control pitch by front and rear interconnection.

the trim material, particularly at the corners of the dash padding. The instrument panel was a veneered plywood, but unfortunately its appearance was more cheap kitchen cabinetry than mahogany paneling. However, examination of several later production models revealed that a better finished, darker (and more luxurious) dash panel is now being installed and more care is being used in applying the vinyl trim.

Almost half of the panel serves as a glove box door, which fastens by a jamproof magnetic latch. The compartment behind this door is, however, quite narrow, although adequate for the maps, sun glasses, pocket expense booklets and other such trivia that usually inhabit such places. It might be noted here that the owner's manual, quite complete and information-packed in the European tradition, is too wide to lie flat in the compartment with the door closed.

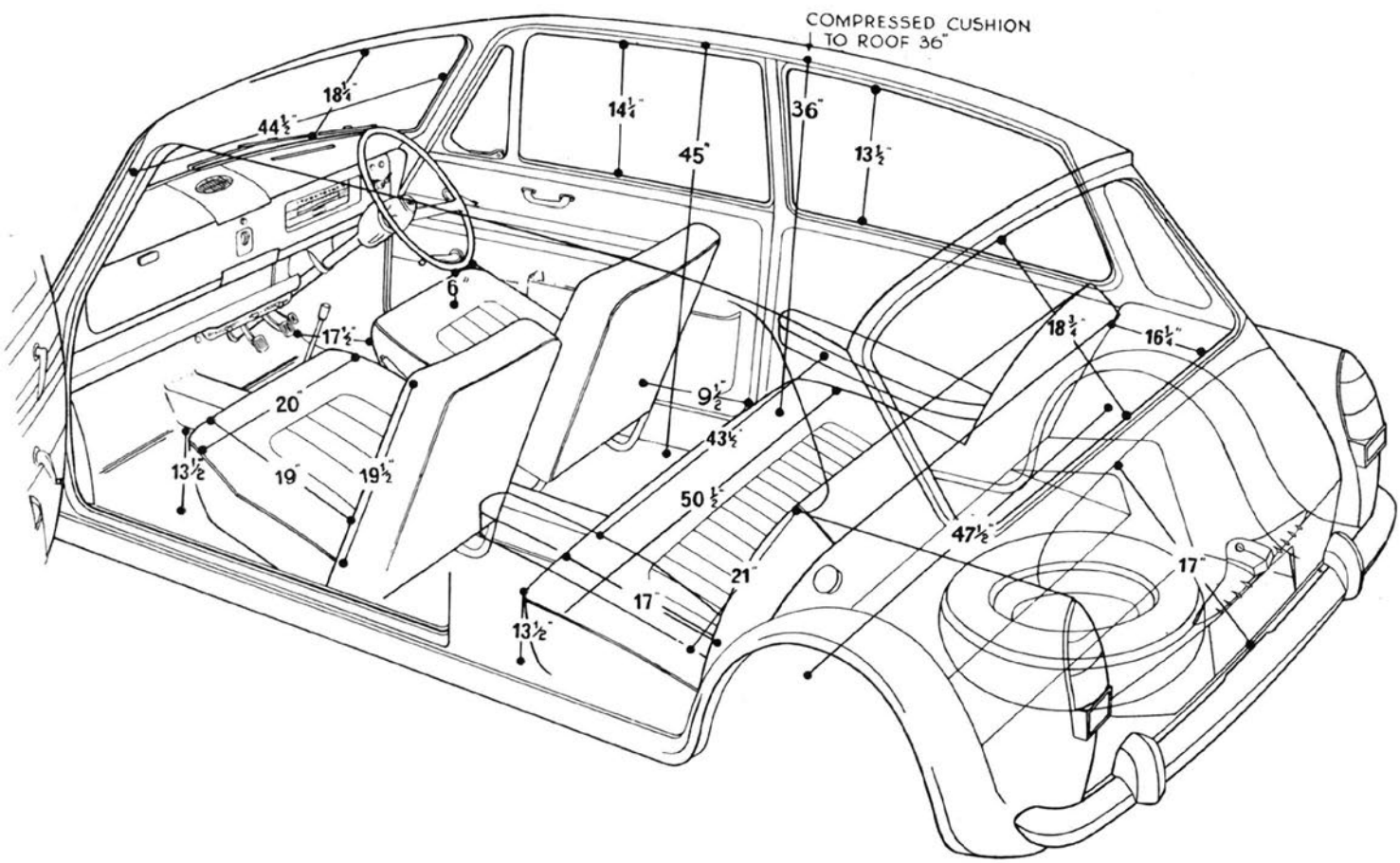
Supplementing the glove box for odds and ends stowage are bins built into each door and behind the arm rests for the rear seats, and a narrow padding-edged ledge underneath the dashboard. Integration of such handy stowage pockets into the bodywork could well be copied by domestic car makers.

The instrument panel consists of a red ribbon speedometer, such as Buick formerly used, flanked by a fuel gauge and a temperature gauge. Once the driver gets accustomed to the spreading red line, the speedometer presents no problems in reading. It was, by the way, extremely accurate throughout the speed range on our test car. Assorted blink lights, toggle switches and knobs are grouped in three rows at the far left of the panel, while heater controls are fastened to the underdash shelf—a location that incidentally takes quite a stretch to reach.

Of the blink lights, the red one which signals oil pressure (or lack thereof) is connected to a switch that senses a pressure drop across the oil filter. If the drop is too great, as when the filter has become clogged, the switch closes and the red light glows to remind the driver that it's time for a replacement filter—this in addition to the more usual function of signifying low oil level and/ or pressure. Of the other lights, two green ones are turn signal indicators, the purple one indicates high headlight beams and an orange one indicates that the generator isn't charging. Another light isn't apparent, but glows through the blue plastic behind the ashtray when the headlights are on; this outlines that receptacle at night and improves a smoker's accuracy of aim.

Toggle switches control headlights, dash lights and windshield wipers. A manual choke control knob and windshield washer knob complete the panel.

One of the best features of the MG ▶



INTERIOR SPACE is measured in this sketch. Front seats adjust on the mounting by 4 in., and mountings in turn can be moved 3.5 in.

NOT TO SCALE

BODY REMAINS LEVEL although far side rear wheel is on curb and near wheel is in gutter.

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is the seating. The individual front bucket seats are foam rubber padded, fabric reinforced molded plastic, with polyvinyl plastic of a leather-like texture bonded to the foam. The whole structure is lightweight and comfortably contoured, providing good lateral support when cornering. A full 7.5-in. fore-and-aft adjustment is available, made possible by three locating positions on the floorboard in conjunction with the sliding adjustment. While the bench-type rear seat isn't sitter-shaped, it does have a comfortably raked back and a cushion that is deep enough to give full under-thigh support (in contrast to shelf-like perches installed in some small cars). All of this in a compartment of such unbelievable spaciousness that it must be experienced to be believed.

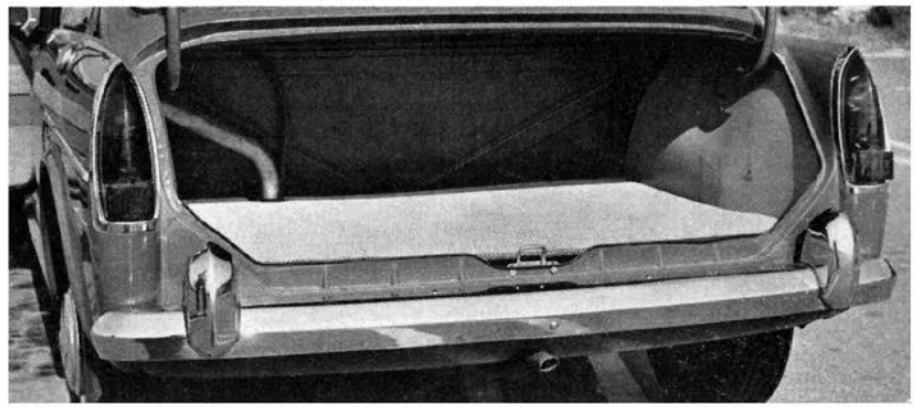
Because of the closeness to the front axle line, the steering wheel is almost bus-like in angle. Drivers with short arms and long legs might find this a problem, but steering quickness is such (3.2 turns lock to lock) that full swings of the wheel are made only when parking.

The suspended pedals are small by American standards, but are wide-spaced enough for broadfooted drivers wearing overshoes. The distance between accelerator and brake is so wide, in fact, that heel-and-toe footwork—

although encouraged by the car's sportiness—cannot be accomplished.

Brakes on the 1100 are superb, pulling the car to a rapid halt from any speed without weaving or fading. Disc brakes 8 in. in diameter are fitted to the front while 8-in. drums (to more easily accommodate a hand brake) are installed at the rear. A pressure-limiting valve between the master cylinder and the rear brakes prevents the lightly-loaded back wheels from locking up during hard stops.

The car is a perfect stablemate for the MG Midget, using as it does the same basic engine and such trim items as the taillights. It is, in addition, a fine sedan for the sports car devotee to graduate to as his family grows beyond the capacity of a roadster. One staff member observed that it is one of the very few cars in the world today worthy of the title "sports sedan" and its impeccable road manners and sheer delightfulness to drive do make it just exactly that sort of car.



FOR SEDAN THIS small, trunk capacity of MG is quite large, adequate for vacations.

After driving the 1100 for almost 2000 miles before regretfully returning it, we concluded that here indeed was a car that might have given VW a race for 1st place in import sales. It has more useful room, is delightful to drive, has better (although different) handling characteristics and more modern styling. If only the Germans had built it (improving the interior trim) and the price were a little less, such a sales goal would have been easily within reach. ■

CAR LIFE ROAD TEST

1963 MG-1100
2-Door Sedan

SPECIFICATIONS

List price	$1898
Price, as tested	2072
Curb weight, lb	1822
Test weight	2154
distribution, %	61/39
Tire size	5.50-12
Tire capacity, lb @ 24 psi	2640 (est.)
Brake swept area	159
Engine type	4-cyl., ohv
Bore & stroke	2.54 x 3.30
Displacement, cu in	67
Compression ratio	8.9
Carburetion	2 x 1
Bhp @ rpm	55 @ 5500
equivalent mph	82
Torque, lb-ft.	61 @ 2500
equivalent mph	37

DIMENSIONS

Wheelbase, in	93.5
Tread, f and r	51.5/50.9
Over-all length, in	146.7
width	60.4
height	52.7
equivalent vol, cu ft	271
Frontal area, sq ft	17.7
Ground clearance, in	6.0
Steering ratio, o/a	n.a.
turns, lock to lock	3.3
turning circle, ft	34.7
Hip room, front	2 x 20.5
Hip room, rear	50.5
Pedal to seat back, max	38.2
Floor to ground	8.0
Luggage vol, cu ft	n.a.
Fuel tank capacity, gal	10.0

EXTRA-COST OPTIONS

Radio, heater, seat belts, outside mirrors.

GEAR RATIOS

4th (1.00), overall	4.13
3rd (1.41)	5.83
2nd (2.17)	8.98
1st (3.63)	15.0

PERFORMANCE

Top speed (5350), mph	80
Shifts, rpm–mph (manual)	
3rd (5500)	58
2nd (5500)	38
1st (5500)	23

ACCELERATION

0-30 mph, sec	5.4
0-40	9.1
0-50	14.3
0-60	22.8
0-70	38.0
0-80	
0-100	
Standing ¼ mile	22.2
speed at end	59.0

FUEL CONSUMPTION

Normal range, mpg	30-35

SPEEDOMETER ERROR

30 mph, actual	31.8
60 mph	60.0
80 mph	79.0

CALCULATED DATA

Lb/hp (test wt)	39.2
Cu ft/ton mile	72.1
Mph/1000 rpm	15.0
Engine revs/mile	4000
Piston travel, ft/mile	2200
Car Life wear index	88.0

PULLING POWER

4th, maximum gradient, %	7.5
3rd	13.2
2nd	17.4
Total drag at 60 mph, lb	115