

THE STIRLING MOSS ERA

12 APRIL 1963

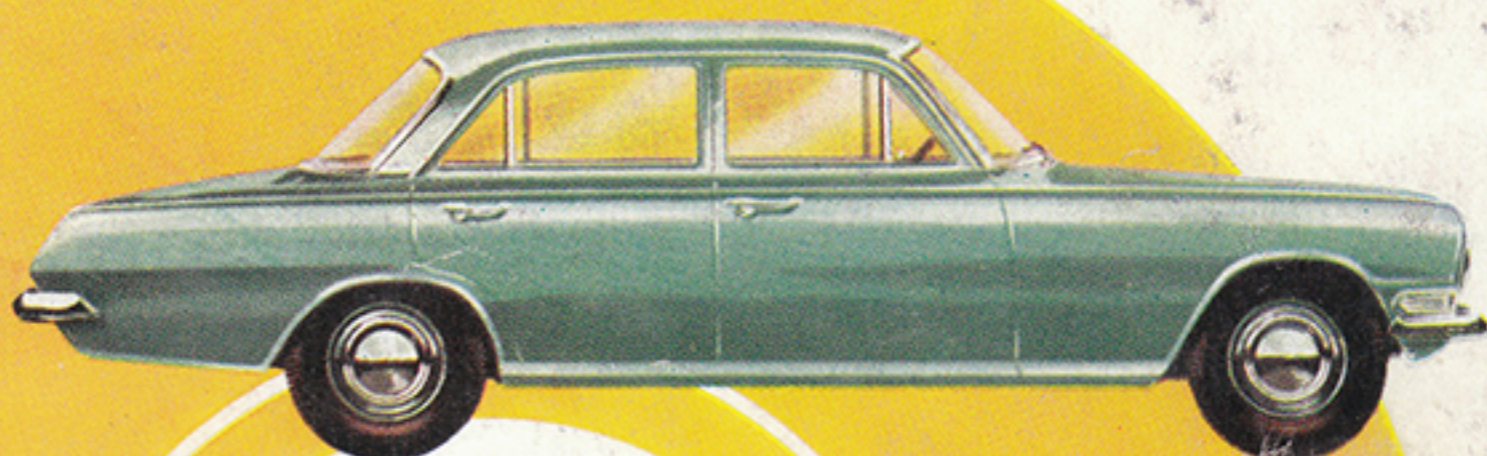
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An appreciation by Sports Editor Peter Garnier

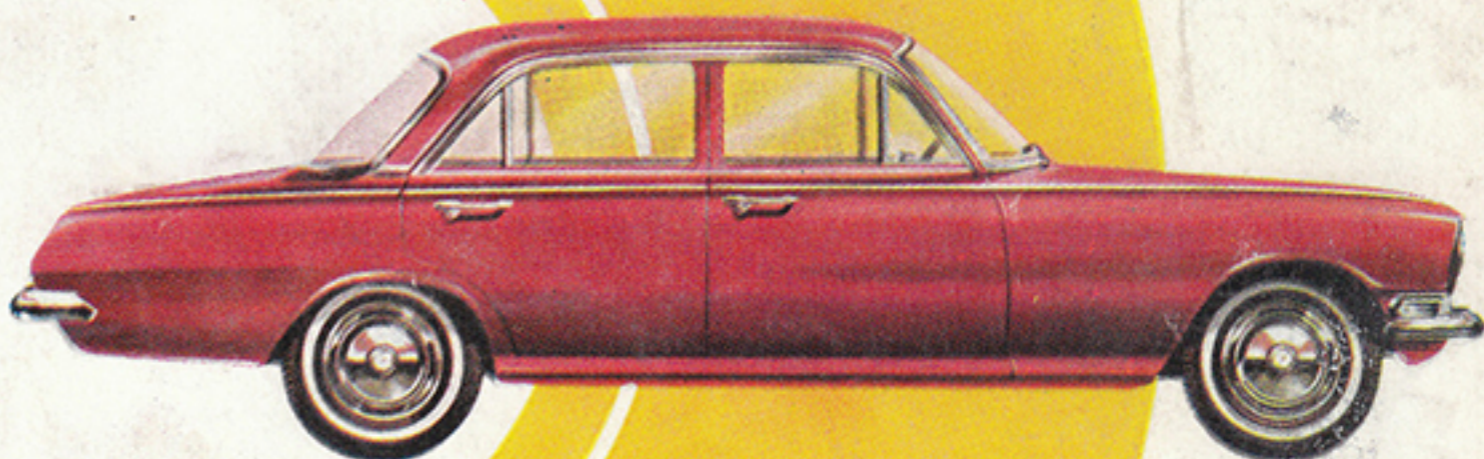
Road Test: New Mini Cooper S-Type

Autocar

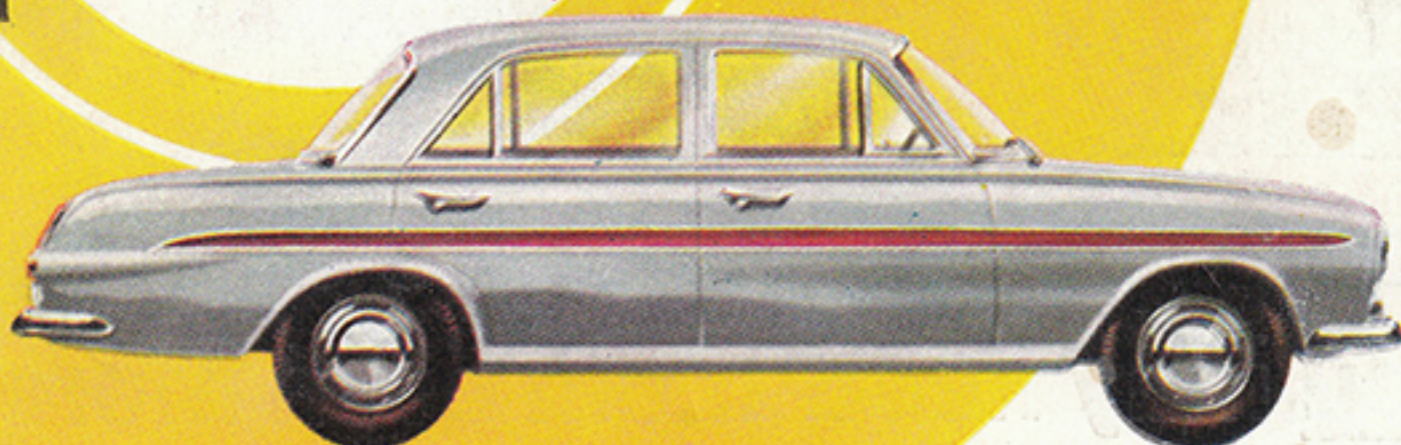
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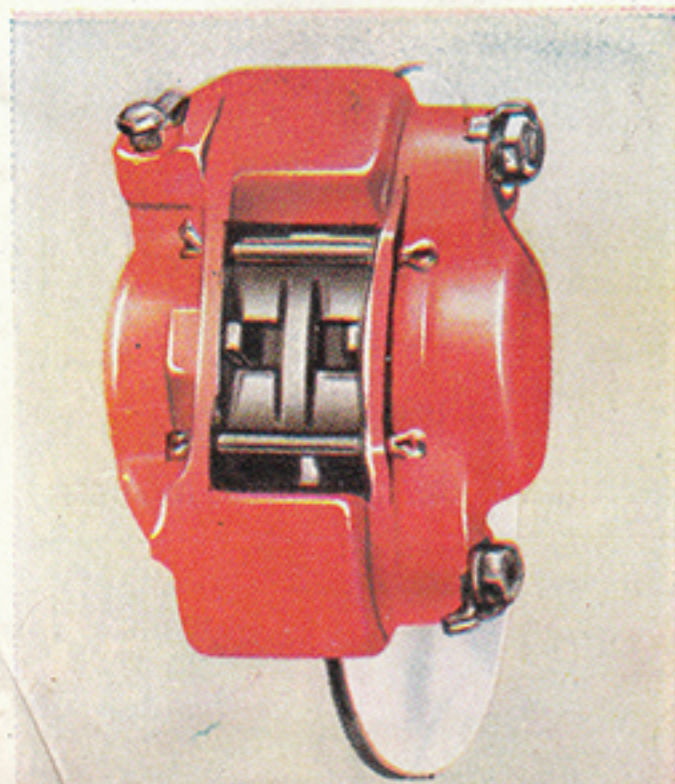
Velox



Cresta



and VX/490



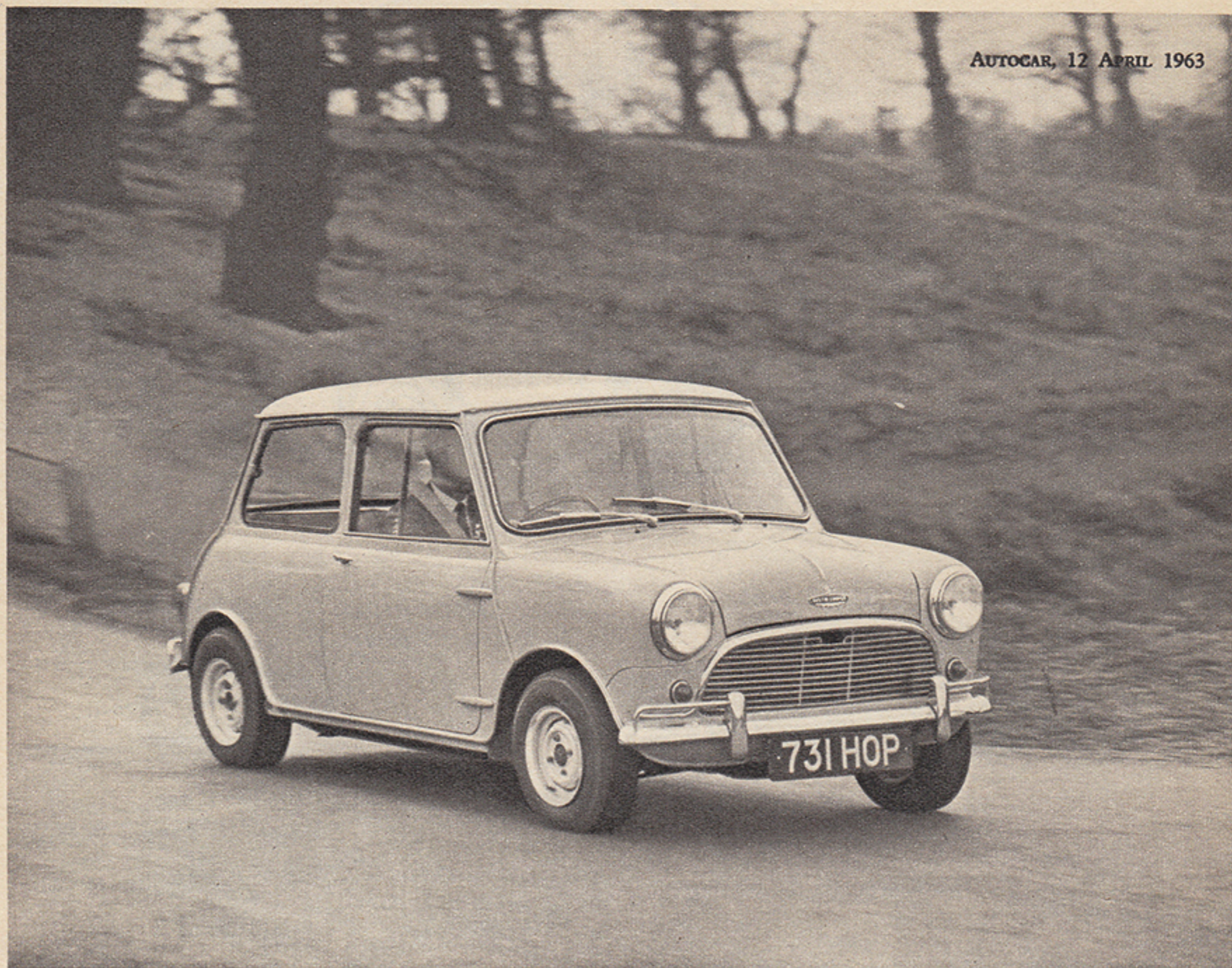
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Austin Mini-Cooper S 1,071 c.c.

SINCE the first B.M.C. Mini was introduced in August, 1959, we have tested a number of variants, some standard production models, others specially tuned. The latest Mini model just introduced and known as the Cooper S-type differs in several significant respects from all others. It is, of course, a normal road car but the designers have had competition potential in mind, and 1,000 are being produced at once so that the type can be homologated. It supplements, not replaces, the familiar 997 c.c. Mini-Cooper, and its over-square 1,071 c.c. engine produces 70 b.h.p. net compared with 55 b.h.p. for the smaller capacity car. Bore and stroke are 70.6 x 68.26 mm; those of the standard Mini-Cooper 62.43 x 81.28 mm.

Believing that readers would be anxious to have our test report, we pressed on and obtained performance figures without waiting for ideal weather conditions, and although the results are very good, accelerations from a standing start would be fractionally better still—by 0.5 to 1 sec perhaps—in dry weather and when the car has done at least twice as many miles as the 2,000 at the time of testing. At the beginning of the test the gearbox was changed after the loss of a gear tooth, and the new unit was stiff. This tended to slow our changes when taking the acceleration figures.

Miniphiles, on seeing our test Cooper S, would notice

at once that the optional wide wheels and low profile Dunlop SP tyres are fitted. The rims are, in fact, 4.5 in. wide and the car's track is increased by 1 in. This change has had a quite pronounced effect on handling as we indicate later. No hub cover plates were provided on this pre-production car. In other respects the body and suspension are identical with those of the ordinary Mini-Coopers.

One of the unexpected qualities of this car is that the considerable extra performance has been obtained without any sacrifice at all in docility and tractability. There is

PRICES	£	s	d
Two-door Saloon	575	0	0
Purchase Tax	120	7	1
Total (in G.B.)	695	7	1
Extras (including P.T.)			
Seat belts (each)	5	0	0
Special tyres			
Sump guard			
	To be announced		

Autocar road test • No. 1918

Make • **AUSTIN** Type • **Mini-Cooper S**

Manufacturer: Austin Motor Co. Ltd., Longbridge, Birmingham

Test Conditions

Weather ... Continuous rain with 5-10 m.p.h. wind
 Temperature 4.4 deg. C. (40 deg. F.)
 Barometer 28.9 in. Hg.
 Wet tarmac and concrete surfaces.

Weight

Kerb weight (with oil, water and half-full fuel tank)
 12.7cwt (1,425lb-645kg)
 Front-rear distribution, per cent F, 62; R, 38
 Laden as tested 15.7cwt (1,761lb-800kg)

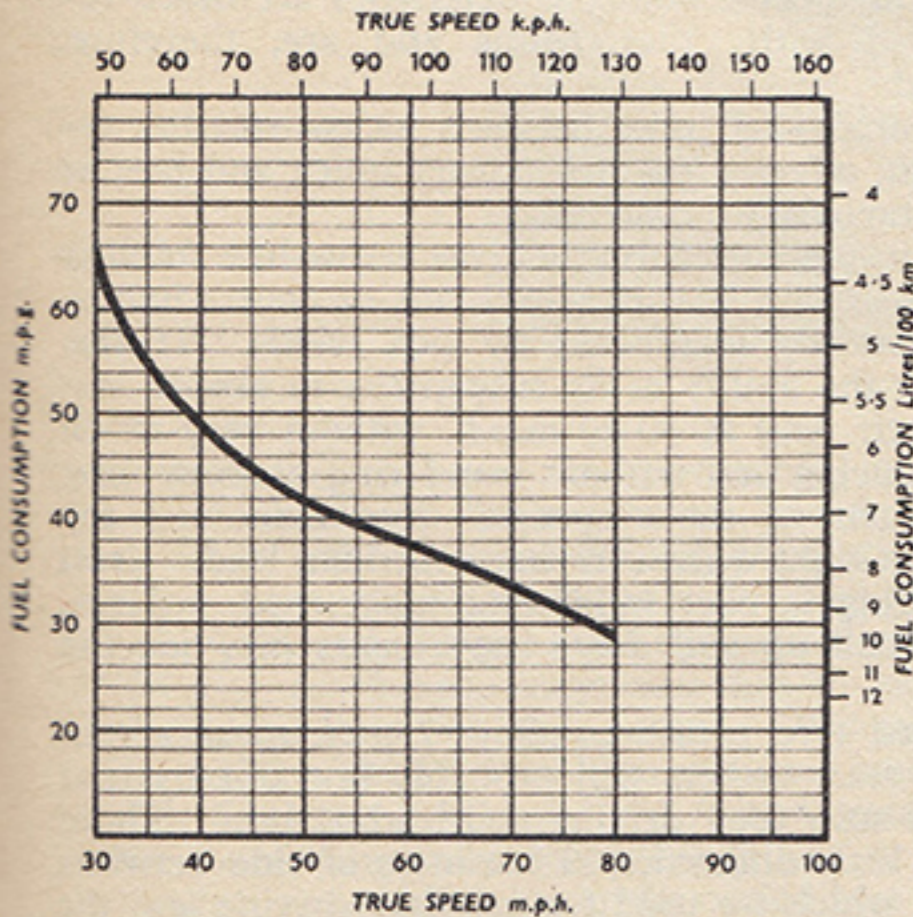
Turning Circles

Between kerbs L, 31ft 11in.; R, 32ft 10in.
 Between walls L, 32ft 8in.; R, 33ft 7in.
 Turns of steering wheel lock to lock 2.3

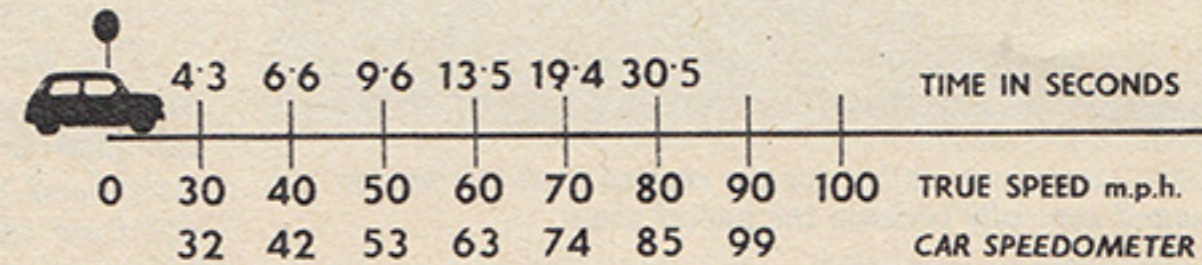
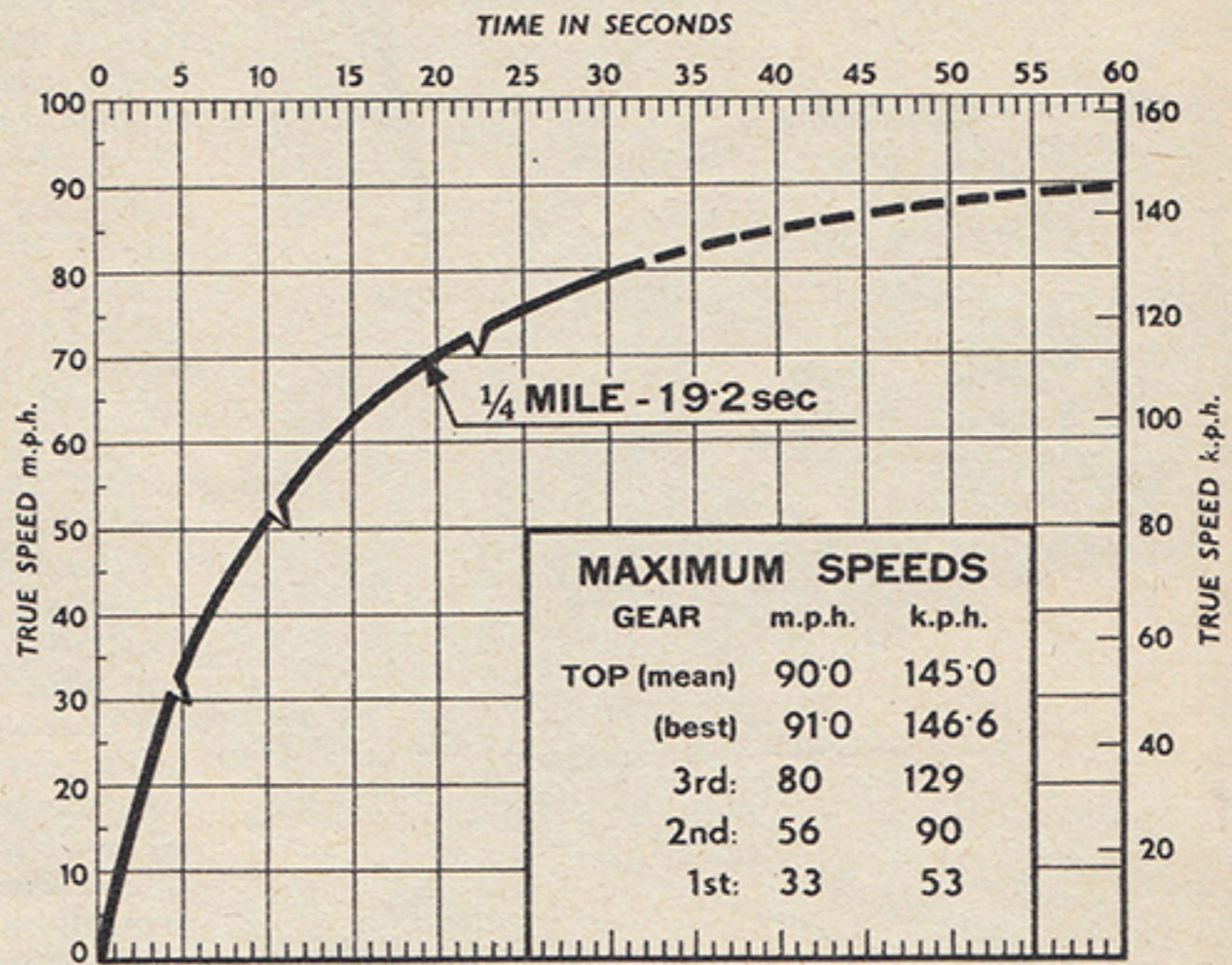
Performance Data

Top gear m.p.h. per 1,000 r.p.m. 14.69
 Mean piston speed at max. power ... 2,775 ft/min
 Engine revs. at mean max. speed 6,130 r.p.m.
 B.h.p. per ton laden..... 89.2

FUEL AND OIL CONSUMPTION



MAXIMUM SPEEDS AND ACCELERATION (mean) TIMES



Speed range and time in seconds

m.p.h.	Top	3rd	2nd	1st
10-30	—	7.6	4.9	3.6
20-40	10.5	7.2	4.8	—
30-50	10.9	7.4	5.3	—
40-60	11.5	8.2	—	—
50-70	14.8	10.3	—	—
60-80	20.0	20.4	—	—

FUEL Super Premium Grade (101 octane RM)

Test Distance 1,235 miles

Overall Consumption 29.4 m.p.g. (9.6 litres/100 km.)

Normal Range 25-42 m.p.g. (11.3-6.7 litres/100 km.)

OIL: S.A.E. 30 Consumption 1,100 m.p.g.

BRAKES

(from 30 m.p.h. in neutral)

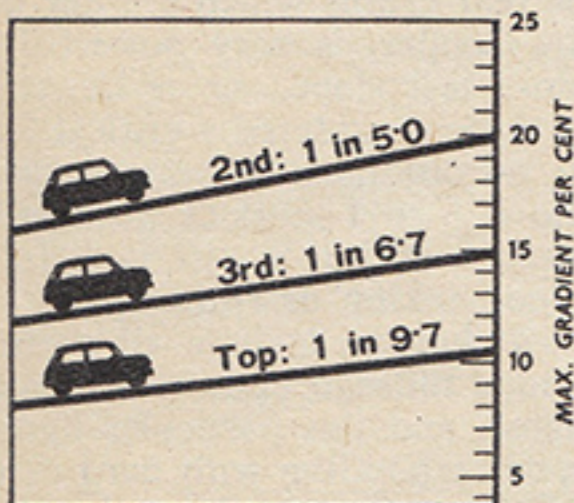
Pedal Load	Retardation	Equiv. distance
25lb	0.35g	86ft
50lb	0.75g	40ft
75lb	1.00g	30.1ft

Handbrake 0.33g 92ft

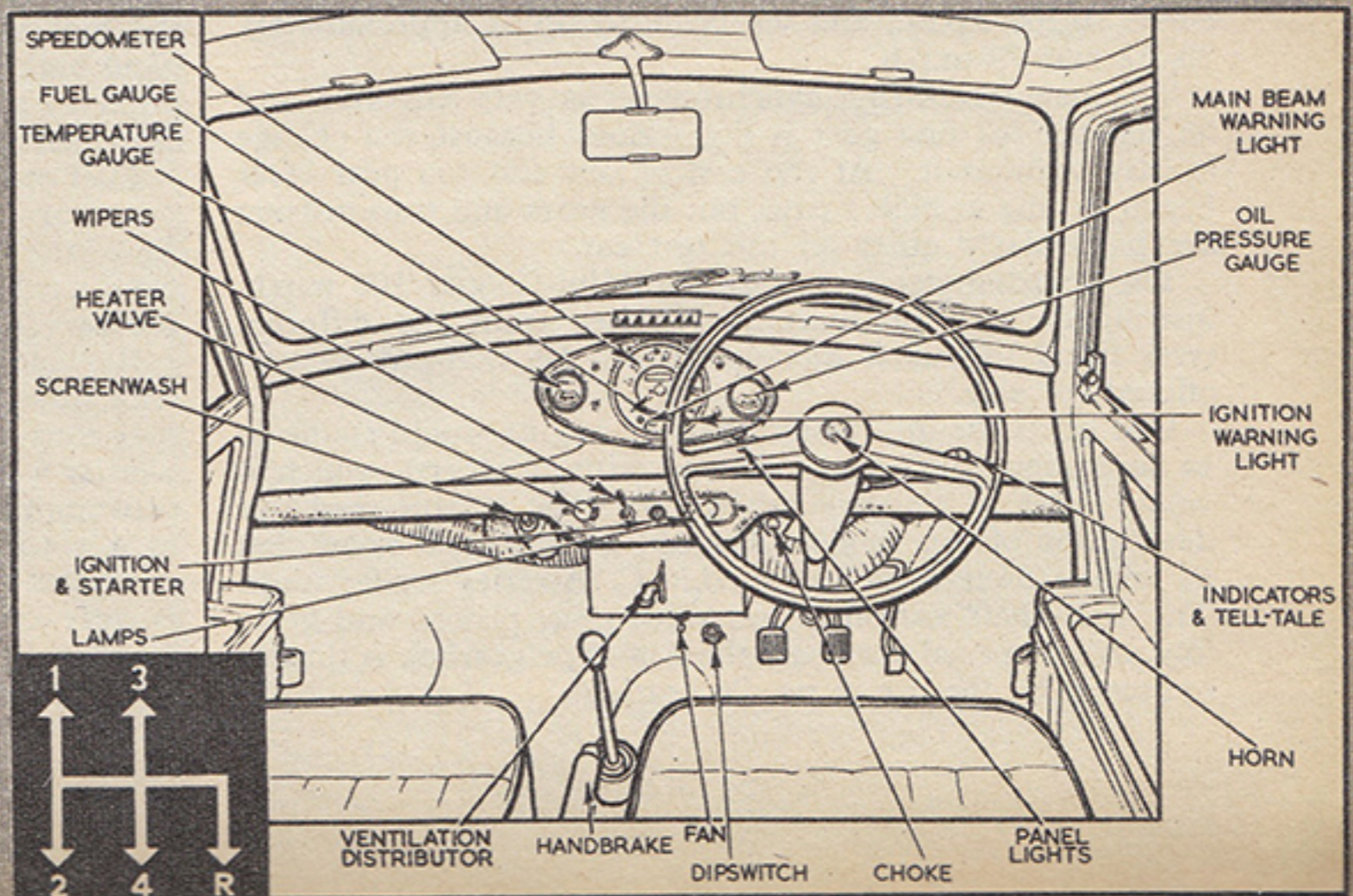
CLUTCH

Pedal load and travel—40lb and 4in.

HILL CLIMBING AT STEADY SPEEDS



GEAR PULL (lb per ton)	Top	3rd	2nd
Speed range (m.p.h.)	34-55	38-53	34-46





A familiar Mini-Cooper interior but for the revised fresh air heater with fan, mounted centrally beneath the parcel shelf

Austin Mini-Cooper S ...

remarkable pulling power down to low r.p.m. as the acceleration figures in 3rd and top gears indicate. What is more, the engine remains quiet and the exhaust note is subdued.

If need be the engine will pull evenly at 10 m.p.h. in third gear and 15 m.p.h. in top—about 1,000 r.p.m.—yet it will also soar up to 7,200 r.p.m. without any harshness or increased vibration. This is the design maximum speed to which the engine will go in standard form without valve bounce. It corresponds on the test car with theoretical maximum speeds in the gears of: top, 106; third, 80; second, 56 and first, 33 m.p.h., with the normal ratios indicated in the specification table. The alternatives are a close-ratio box and a final drive ratio of 3.44 to 1 instead of 3.77. In practice it does not pay to go beyond the peak of the power curve—6,200 r.p.m., and we changed up at approximately 30, 52 and 73 m.p.h.

The new baulk-ring synchromesh is very effective and its absence for first gear is not serious because the change is easy without it. At the end of our test the gear lever began to sing at high r.p.m., but the gears and transmission are particularly quiet on the test car.

The speedometer is a standard Mini-Cooper 100 m.p.h. instrument and the inaccuracy arises from the different tyres fitted to this S model. It will be changed on cars offered for sale.

One gains the impression that the engine would stand up to continuous high-speed driving without worry—which it would have to do in competition. Those who read our description of this model (*Autocar*, 5 April) will know that its engine owes a lot to the B.M.C. A-series racing units. The crankshaft, camshaft and valve gear, pistons and bearings are all special parts and the new-type gearbox is further improved by the use of needle bearings.

Most previous Minis tuned to give comparable performance with this S-type are near the peak of development for power and torque, whereas this new car has a good deal more in hand for enthusiasts to extract.

The highest true speed we saw during the test was 91 m.p.h., although with a little help from wind or gradient this easily rose to 95 m.p.h. A timed lap of the Motor Industry Research Association's test circuit in bad conditions, two up and with fifth wheel in tow, gave 88 m.p.h. More exhilarating than the high speed and near-maximum continuous cruising, is the eagerness of the car to accelerate. Combined with small size and extreme manoeuvrability this makes the S almost unique in its ability to thread its way rapidly and safely through traffic.

To transmit the extra torque, the clutch has been modified but it has lost nothing of its feel or smoothness for ordinary driving. For a quick getaway it bites positively without spin and, wet as well as dry, the SP tyres grip in a remarkable manner to help the little car away. Zero to 30 m.p.h. in first gear, in 4.3sec is a rapid departure for one so small and unobtrusive.

A track increased by 1in. (0.5in. distance pieces are inserted to obtain clearance) with the wide rims, and the broad footprints of the special tyres, improve both the stability and adhesion of the already sure-footed Mini. There is the customary slight running outwards or understeer when using power through corners and a tendency to dig in or tighten-up if you cut the power while cornering. But at all ordinary road speeds, both characteristics are much reduced compared with other Minis and are, therefore, scarcely noticed.

The high geared—2.3 turns between locks—steering remains very light, offering the driver very quick and precise control for manoeuvre or correction.

The weight-in-the-nose formula gives arrow-like stability at speed, so, small as it is, this Mini holds its course hands-off and is practically unaffected by side winds. It also surprised us by the ability of its suspension to absorb test sections of rough *pavé* at 30-40 m.p.h. without very much pitching or bouncing and without wandering or bottoming at all. The extent of the suspension movement and the damping are just right when carrying a medium load. Least comfortable riding is over indifferent main road surfaces, where rapid, small up and down movements may jog the occupants.

The suggested tyre pressures allow 2 p.s.i. more at the front than the rear; owners will probably find out by trial and error what suits their driving and loading best. There is surprisingly little difference in hardness of ride between the 24-22 p.s.i. which we used for ordinary driving and the 32-30 p.s.i. for continuous high speed.

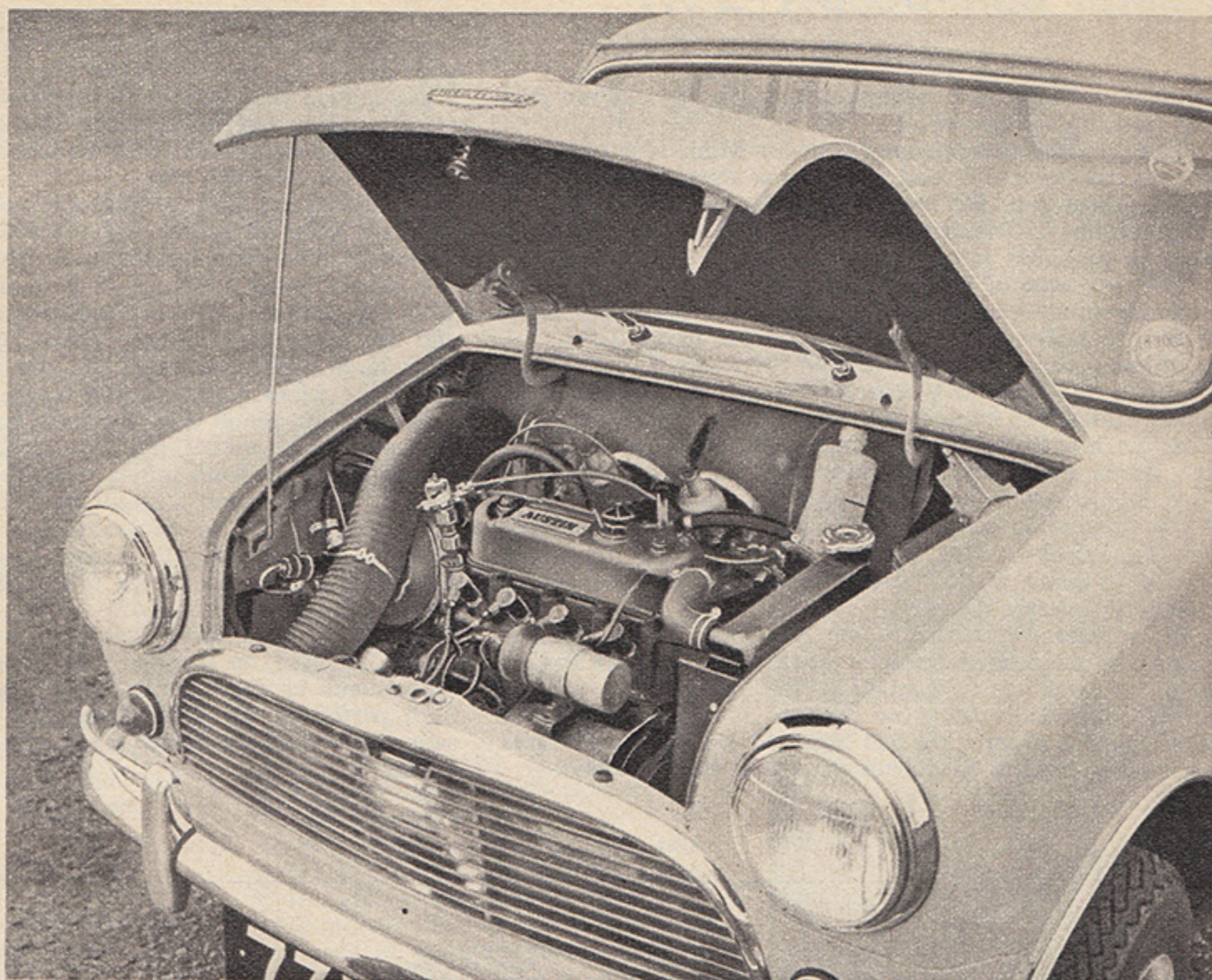
Bigger Discs and a Servo

One of the major improvements of the S-type is to the front brakes. Their discs are 0.5in. bigger in diameter and 0.175in. in thickness. This provides an 80 per cent increase in capacity to absorb heat. A Hydrovac servo is also fitted with the result that pedal pressures are light, response is instantaneous and lower friction (harder) pad material to resist fade can be used. It will be seen that the braking figures recorded are exceptionally good. The hand brake, working on the rear drums which are like those fitted to the ordinary Mini-Cooper, is very powerful and will hold the car on a 1-in-3 test slope, up or down.

Fuel consumption is not to be considered a critical factor on a car such as this, but no one likes to be extravagant. Since the compression ratio is 9 to 1 most of the test was conducted on super premium fuel, but a trial tank full of ordinary premium caused no pinking or running on.

Regular readers will know that we include all performance measurements in the total mileage upon which overall fuel consumption is calculated, and this particular figure is usually a little pessimistic, corresponding with hard driving consumption. The Mini-Cooper S is likely to be driven in a spirited manner, being designed for this and by its character inviting it; thus our overall figure of 29.4 m.p.g. is very creditable indeed. For a 32-mile journey across London (using the new type Petrometer for measurement) we recorded exactly 40 m.p.g., while for 80.5 miles from

The exterior of the 1,071 c.c. engine gives no clue to the extra power it produces. Under the air trunk the brake servo is just visible



end to end of M1 and its approaches, cruising at about 85 m.p.h. but with flat-out bursts, the figure dropped to 26.5 m.p.h. We got over 30 m.p.g. on all journeys.

Oil consumption increases at high speeds, and on the M1 drive mentioned the pressure dropped from its customary 70-75 p.s.i. to 45 p.s.i. suggesting that an oil cooler may be desirable for long distance racing. The radiator thermometer, oddly, placed in the circuit, was unserviceable, but the air from the heater did not feel abnormally hot.

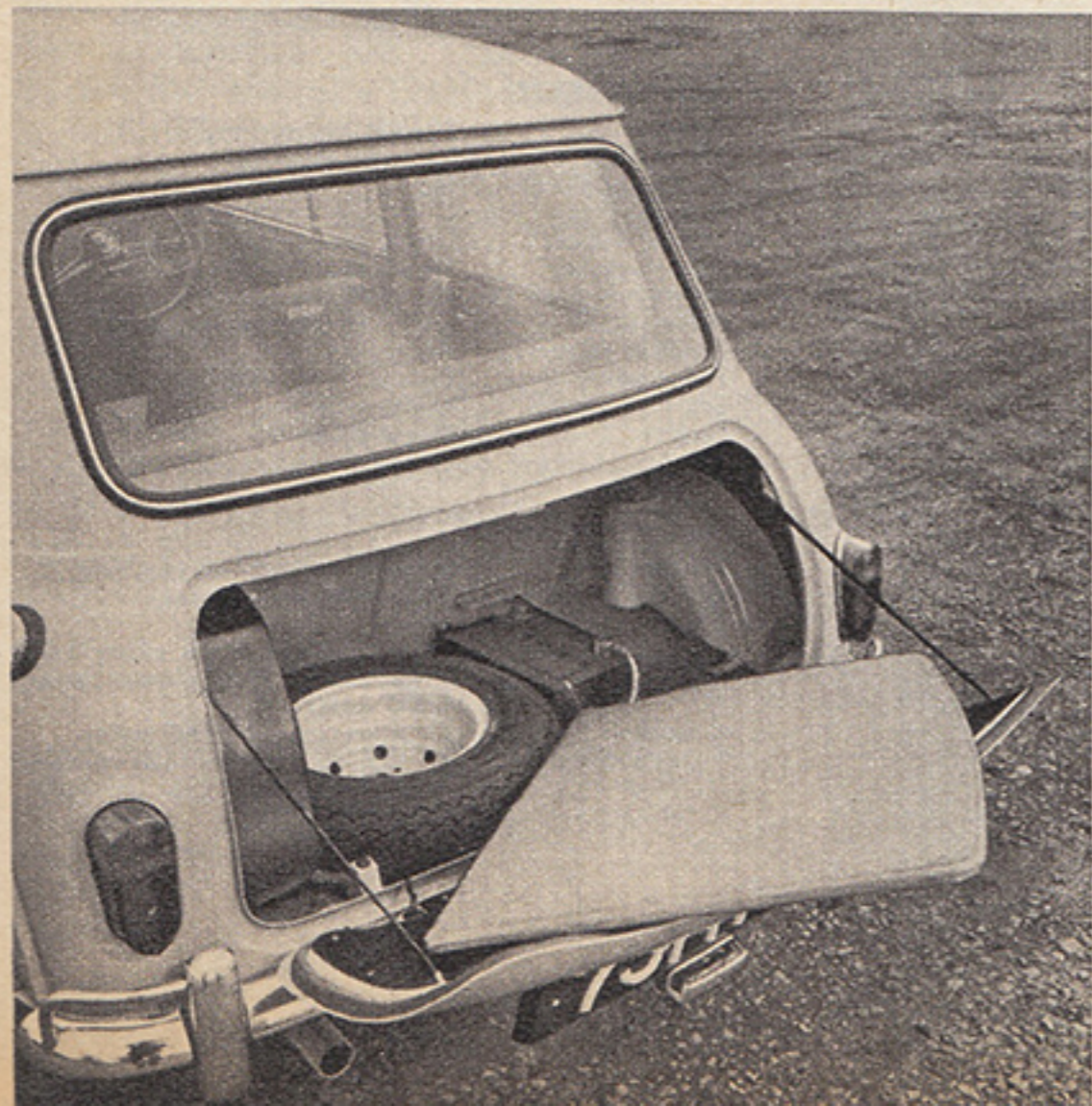
For journeying and touring, 5.5 gallons or a range of, say, 175 miles is not sufficient, so the option of a twin additional 5.5-gallon fuel tank on the right-hand side of the boot is a useful provision.

It is logical to offer the car with the basic Cooper equip-

ment and trim since this simplifies production and keeps the cost down. No doubt also some owners would wish to make changes and additions to suit themselves; for example, a rev counter and a better rear view mirror (the one fitted does not take advantage of the large rear window and gives a distorted image). Then two-speed wipers would help when driving fast in rain; a headlamp flasher would be useful, and the single horn, though it sounds pleasant and is quite penetrating, could, with advantage, be louder.

Some owners would want to fit a different driving seat, mounted farther back and giving improved location. However, our drivers are accustomed to the Mini stance and the handle-bar grip on the steering wheel's two spokes. We

A twin 5.5-gallon tank is offered for installation at the right side of the boot. The battery and spare wheel help to balance the weight distribution. Note the hinged number plate and the rigid, carpeted floor panel. The wide wheels and tyres protrude at front and rear; extended edges for the wheel arches may be desirable to catch spray



Austin Mini-Cooper S ...

thought the seat back rather too upright but did not find the car tiring on long drives.

The standard pedal arrangement for Minis is satisfactory; on this car the travels and loads are as they should be, and one can heel-toe. But we would prefer to have pedal pads of larger area. Some drivers found the heater inconveniently close to their left foot.

The new type of heater together with its fan is mounted centrally under the panel and shelf. The fan is displaced from the under-bonnet position by the brake servo. A prominent control lever has "off" "screen" and "car" positions and there is a separate booster fan switch. This whole equipment is plain and reasonably effective. For the rest, the interior is familiar, functional Mini—panniers on the doors, and pockets flanking the rear seats, washable roof lining, cut unbound carpets and p.v.c. seat covers. There are sliding windows in the doors and round the door openings thick rubber sealing strips, sections of which tended to come adrift. The door latches have levers, not cables, to operate them.

By adjustment of the heater, the four sliding window panes and the hinged extractor windows at the back (which tend to shake shut) ventilation and temperature can be nicely controlled. The car interior is not draughty and wind noise is slight. We had expected to hear the SP tyres but they proved to be quieter than most special covers.

There is a roof lamp with its own switch but no door operated courtesy switches. It would be better if the instrument lighting did not reflect through the ignition warning glass giving the impression that charging has stopped. The S was a good cold starter until the battery twice let it down after standing overnight; since neither charging fault nor short circuit were found, and the trouble corrected itself, we suspected a doubtful cell.

At night this Mini is pleasant to drive because of the excellent view all round and the absence of annoying reflections. The main headlamp beams give plenty of range and when dipped their cut off is clean but not too abrupt. The side lamps share the headlamp reflectors and glasses, and are good and bright. Vision from all Minis suffers from large grubby areas at the top corners of the screen where the wiper blades cannot reach.

Bearing in mind that the test car was a very early example of the model, and was driven very hard, it was refreshingly free from minor troubles. A sticking throttle after 1,200 miles and a slight blow from an exhaust pipe joint were all that we experienced.

Unless B.M.C. have to restrict production of the Mini-Cooper S we do not doubt that it will sell widely. The additional cost which, with extras at prices yet to be announced, would bring the home total to between £700 and £750, will be justified for those who appreciate the refinements of mechanical design and want exceptionally high performance. Apart from this the S is a practical, safe, stimulating and extremely quick little car. We enjoyed testing it.

Specification

Scale: 0.3in. to 1ft.

Cushions uncompressed.

ENGINE

Cylinders ...	... 4 in-line
Bore ...	... 70.6mm (2.78in.)
Stroke ...	... 68.26mm (2.69in.)
Displacement ...	... 1,071 c.c. (65.35 cu. in.)
Valve gear ...	... Overhead, pushrods and rockers
Compression ratio	... 9.0-to-1
Carburettor ...	... Two S.U. Type HS2
Fuel pump ...	... S.U. electric
Oil filter ...	... External, renewable element, full flow
Max. power ...	... 70 b.h.p. (net) at 6,200 r.p.m.
Max. torque ...	... 62 lb. ft. at 4,500 r.p.m.

TRANSMISSION

Clutch ...	... Borg and Beck 7.13in. dia. Single dry plate
Gearbox ...	... Four-speed, floor change, synchromesh on upper three ratios
Overall ratios ...	... Top 3.77, 3rd 5.10, 2nd 7.21, 1st and reverse 12.04
Final drive Helical spur gears 3.77 to 1

CHASSIS

Construction Integral steel body
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SUSPENSION

Front Independent, wishbones, rubber cone springs, Armstrong telescopic dampers
Rear ...	... Independent, trailing arms, rubber cone springs, Armstrong telescopic dampers
Steering ...	... Rack and pinion
Wheel dia. ...	... 15.8in.

BRAKES

Type ...	... Lockheed hydraulic, discs front, drums rear, with Hydrovac booster
Dimensions ...	... F. 7.5in. dia. disc; R. 7.0in. dia., 1.25in. wide shoes
Swept area ...	... F. 120 sq. in.; R. 55 sq. in. Total: 175 sq. in. (223 sq. in. per ton laden)

WHEELS

Type ...	... Pressed steel, 4 studs
Tyres ...	... 4.5in. wide rim
	... 145mm—10in. Dunlop SP

EQUIPMENT

Battery ...	... 12-volt 34-amp. hr.
Headlamps ...	... Lucas 50-40 watt
Reversing lamp ...	... No
Electric fuses ...	... 2
Screen wipers ...	... Single speed, not self parking
Screenwasher ...	... Standard, manual plunger
Interior heater ...	... Standard, fresh air
Safety belts ...	... Extra, anchorages provided
Interior trim ...	... P.v.c.
Floor covering ...	... Carpet, felt underlay
Starting handle ...	... No provision
Jack ...	... Screw pillar
Jacking points ...	... 1 each side under sill

MAINTENANCE

Fuel tank ...	... 5.5 Imp. gallons (no reserve)
Cooling system ...	... 6.25 pints (inc. heater)
Engine and transmission sump ...	... 8 pints. Change oil every 3,000 miles; change filter element every 6,000 miles
Grease ...	... 10 pints every 3,000 miles
Tyres pressures ...	... F. 24; R. 22 p.s.i. (normal driving); F. 28; R. 26 p.s.i. (fast driving)

