

'SHORROCK' SUPERCHARGING THE AUSTIN-HEALEY SPRITE. PART 2.

Although supercharging Sprites is not as popular as it was during the 1960's there are still quite a few people who want to increase the power of their car without going the way of a big motor. Fitting a 'blower' is just one way of doing this. All the following information is from the archives of "THE SPRITE ROOM" and where possible its source has been credited and dated.

# 'TO BLOW OR NOT TO BLOW...'

... that is the question the Editor asked himself before tuning the A40 engine. A shorrock supercharger was eventually chosen and after 7,000 miles we are still impressed with its performance

As we explained in our article on Basic Tuning in the April issue, there are two ways in which we can increase the performance of a standard engine. We can burn the fuel more efficiently and/or we can get more fuel mixture into the engine.

Conventional engine tuning is usually a combination of both methods. We burn the fuel more efficiently mainly by increasing the compression ratio, and we get more fuel by such means as opening out the inlet tracts, fitting a

camshaft with longer opening periods, and using multiple or larger carburettors. The fuel mixture has to rely on atmospheric pressure to push it into the cylinder as the piston descends, and as atmospheric pressure is normally constant (give or take a little), 'opening out' methods are the only available means of increasing the amount of mixture the engine can suck in at each induction stroke.

However, if we could somehow increase atmospheric pressure, we *could*

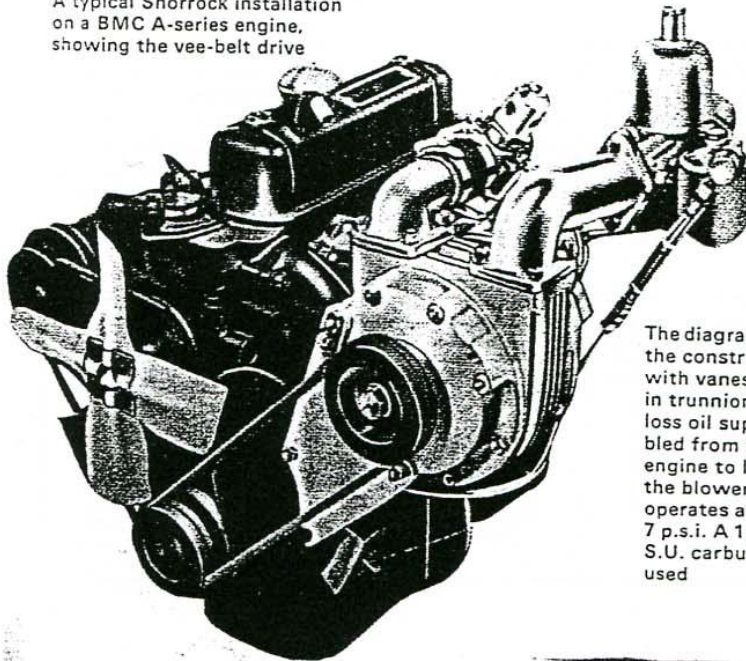
stuff more mixture into the cylinders, and this is where the supercharger comes in.

A supercharger is simply an air-compressor driven by the engine that can supply air to the engine at a pressure greater than atmospheric.

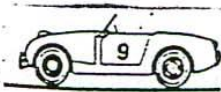
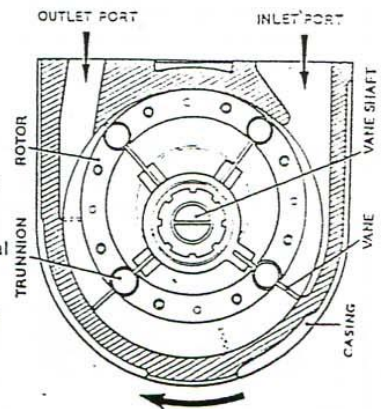
In practice, it is usual to mount the supercharger between the carburettor and the inlet manifold. A much larger carburettor than standard is used and the blower is able to stuff large quantities of fuel mixture in through the restricted inlet passages of even a completely unmodified 'cooking' engine, with a consequent increase in power output. As it is driven by the engine, it follows that the amount of 'boost' increases in proportion to the engine speed. Thus, at low speeds the blower has very little effect and the engine retains its 'touring' character, while as the speed rises, the blower's influence increases and instead of torque and power falling away quite early, the performance gets better and better!

Obviously, the increased 'punch' at maximum output puts much greater

A typical Shorrock installation on a BMC A-series engine, showing the vee-belt drive



The diagram shows the construction, with vanes sliding in trunnions. A total loss oil supply is bled from the engine to lubricate the blower, which operates at about 7 p.s.i. A 1½-inch S.U. carburettor is used



loads on the bearings and other mechanical parts, rather as a greatly increased compression ratio would do, but it is at low engine speeds that a high compression ratio is most harmful, whereas the blower only exerts its full effect at high speeds, when the power is 'flowing' rather than 'hammering'. Nevertheless it is usual to avoid high compression ratios with a blown engine and to change the distributor (or modify it) to give less ignition advance at high speeds.

In pre-war days supercharging was a very popular way of getting a high power output from a small engine, mainly for racing. These blown racing engines (which used both high compression ratios and high blower pressures) tended to be noisy and temperamental and to demand exotic fuels, which is probably why there is still a certain amount of prejudice against the idea of supercharging a road-car.

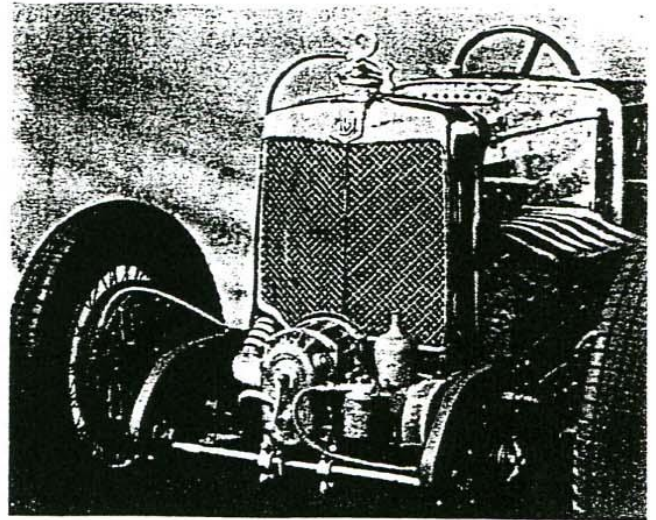
I had a hunch that this prejudice was not justified, and so approached the Allard Motor Co., 51 Upper Richmond Road, Putney, London S.W. 15, who are the sole distributors for Shorrock superchargers, and this eventually led to my fitting one to my Austin A40, as mentioned in 'One Man's Meat ...'.

So much for the background, but how did it work out in practice?

The kit arrived, neatly crated, with fully detailed instructions. Kits are marketed for most BMC A-series cars, from '850' Minis to the latest Spridgets, and all necessary parts are provided. After reading the instructions carefully one evening, I started on the job the next morning and (with generous breaks for refreshment) had the blown engine running early that evening. It would have been completed much earlier, except that (a) due to a pure misunderstanding, I had been sent a kit for a 948-c.c. A40 instead of 1100-c.c., and some time-consuming bodging was necessary to make everything fit, and (b) my tool kit lacked the special monster box-wrench necessary to remove easily the crankshaft pulley nut in order to replace the single-groove standard fan pulley with a three-groove one for the blower drive.

A famous pre-war 'blown eleven-hundred' was the K3 Magnette M.G.

This is the 1934 model, with a Marshall blower slung between the front wheels. Blowing at some 20 p.s.i., it needed methanol fuels to avoid overheating



Without snags (a) and (b), I estimate that the ordinary 'home mechanic' could do the job easily in five hours.

It took a little time to get the outfit into peak tune, but then we settled down to an objective and subjective assessment of the result.

The Crypton Rolling Road dynamo-

b.h.p. was now produced at only 3,600 r.p.m.

In practical performance testing the maximum speed (in both directions) proved to be a genuine 90 m.p.h. (with the speedometer off the scale; it read generally about 5 m.p.h. high, partly due to the smaller-diameter SP tyres), while the standing quarter-mile was covered in 20.2 sec. virtually identical to the Mini-Cooper and the Mark II Midget. However, it was the top gear acceleration figures that were the most impressive. The 30-50 m.p.h. figure of 11.0 sec. fell between the Cooper and the Midget, but the 50-70 figure was *exactly the same as that for 30-50* and much better than either of the other cars. A subsequent test with a Bowmonk accelerator confirmed our deduction that the torque curve was almost dead flat for 1,500-5,000 r.p.m. When the acceleration of other cars was tailing off, our blown A40 just went on and on! Compared with the 50-70 m.p.h. acceleration figure for the standard A40 of 39.2 sec., the blown figure of 11.0 sec. is quite amazing!

If the objective results were impressive the subjective impressions of the blown car were equally satisfactory. The

Continued on page 38

**SHORROCK SUPERCHARGER KITS**  
available for BMC models

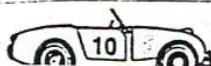
Austin Morris Mini (850-c.c.), £59.  
Austin A40 Minor 1000 (948- and 1100-c.c.), £59.  
Austin Morris 1100, £59.  
Sprite/Midget (948- and 1100-c.c.), £59.  
Riley Elf/Wolseley Hornet, £63.  
Austin Morris Mini-Cooper (998-c.c.), £63.  
M.G./Wolseley/Princess 1100/Riley Kestrel, £63.

Full details from Allard Motor Co. Ltd.,  
51 Upper Richmond Road, Putney,  
London S.W.15.

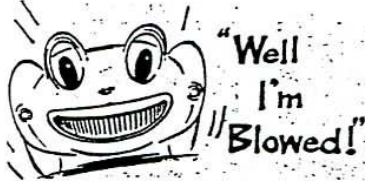
meter at Abingdon indicated a power output of some 62 b.h.p. at something like 5,600 r.p.m., in contrast to the 48 b.h.p. at 5,100 r.p.m. of the standard unit—an improvement of some 30 per cent. without any modification whatever to the engine itself. What was particularly impressive was that the original 48

**COMPARATIVE PERFORMANCE FIGURES**

	Standing ¼-mile (sec.)	Through gears 0-60 m.p.h. (sec.)	Top Gear 30-50 (sec.)	Top Gear 50-70 (sec.)	Max. Speed (m.p.h.)	B.h.p.	Kerb. Wt. (cwt.)	B.h.p./ton
Austin A40 (supercharged)	20.2	15.6	11.0	11.0	90.0	62	16	78
*Austin A40 (standard)	23.1	27.1	14.7	39.2	76.5	48	15½	61
*M.G. 1100 .. .. .	22.1	20.2	13.5	20.1	87.3	55	16½	67
*M.G. Midget II .. .. .	20.1	14.9	10.6	13.5	91.8	59	13½	86
*MGB .. .. .	18.7	12.1	8.9	10.0	108.1	95	18½	101
†Mini-Cooper .. .. .	20.1	16.8	11.3	15.1	90.0	55	12½	88
*Mini-Cooper 'S' 1275 .. .. .	18.2	10.9	7.3	9.2	95.0	76	12½	121
†The Autocar' road test								
*The Motor' road test								



AUTOSPORT, NOVEMBER 27, 1959



in fact—**SHORROCK**  
SUPERCHARGED

MY PERFORMANCE? Read the forthcoming Road Tests  
in all the motoring journals.

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### Supercharged Sprite

IN future the sale of Shorrock superchargers for British Motor Corporation cars will be handled by Donald Healey and Co. Ltd. Kits for the Austin-Healey Sprite, substantially akin to that used for recent record runs on the Utah salt flats, are already available at a price of £69 17s. 6d. The supercharger provides a boost pressure of about 7 lb. per sq. in., giving an engine output of 64 b.h.p. at 5,500 r.p.m. The normal Sprite gives 42½ b.h.p. at 5,000 r.p.m.

For a new Austin-Healey Sprite supplied with the supercharger fitted the price of the car is increased by £75.

*The Motor* November 4, 1959

OCTOBER, 1960  
MOTOR SPORT



THERE IS A  
**SHORROCK**  
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# TO BLOW OR NOT TO BLOW ... continued

simplest way to put it is that it feels, not like a tuned 1100-c.c. car, but a good touring car with a much larger engine, perhaps even getting on for two litres. It has all the smoothness, flexibility, and top-gear pull of a big car, with the compactness and manoeuvrability of a small one. It will trickle along at 20 m.p.h. in top gear and pull away quite strongly; the power really 'comes in' at about 30-35 m.p.h. and from then on it just keeps on going. It idles smoothly and quietly, starts easily, and, of course, the carburetter is easier to tune than two.

The extra torque that is now available makes power-on cornering very much steadier, and as there is no need to 'row it along with the gear lever' (as is the case with some 'hot' engine conversions) a long journey is less tiring. The lack of noise is a help in this direction, too. There is no 'banshee scream of the blower' as some might imagine from pre-war legend; just a faint whine that is only detectable on full acceleration, and an induction hiss from the carburetter (there is no room for an air cleaner silencer) on part-throttle at low speed. The performance figures were taken using the standard exhaust system, so there need be no more noise than usual from that quarter.

As maximum speed is reached quickly, at beyond the revs. for maximum power, it is pretty certain that the engine would pull a higher axle ratio easily. This would make fast cruising even quieter and perhaps raise the maximum speed a little as well.

It would also improve the fuel consumption. As the blown engine gains its extra power from stuffing more fuel in, rather than burning it more efficiently and some power is lost in driving the supercharger, it is to be expected that consumption will be heavier, but it is not bad, for all that. In standard form the A40 averaged 37 m.p.g. over about 1,000 miles of assorted running, including town driving, country commuting, some long-distance cross-country work, and some motorway stretches. With the blower fitted, a similar 1,000 miles resulted in exactly 30 m.p.g., which is very fair considering that the performance had been well-used, and cruising speeds had risen by at least 10 m.p.h.

For a total outlay of less than £60 it would be very difficult to find an alter-

native tuning programme that would give such all-round improvement in performance as can be obtained with the Shorrock supercharger. If you want to use a car for competition work, some regulations may rule out blowers, but others may simply put you up into the next higher capacity class, which in some cases could be an advantage! The blown car does use a little more fuel than one modified by conventional means, but that seems to me to be the only disadvantage. It uses a little more oil, too, as the blower is lubricated by total loss by a bleed from the engine's oil system, but that's a very small amount. Oh yes, and the blown engine needs only 98-octane premium fuel, not the 100-octane usually demanded. After some 7,000 supercharged miles no snags concerning reliability have appeared at all.

For road use, particularly for a touring car with a 'cooking' engine that might be difficult to sell subsequently if extensively modified, the modern low-pressure supercharger has a great deal to commend it.

S. P. S.

### Footnote

*Abingdon and Shorrock superchargers have been associated for a long time, of course. Back in 1937, Goldie Gardner's M.G. record-breaker was Shorrock blown and so were the M.G. and Austin-Healey streamliners that notched up so many speed records at Utah in 1957 and 1959, culminating in Phil Hill's run at 254.53 m.p.h. in EX 181, powered by a Shorrock-blown 'MGA' Twin Cam engine of 1489 c.c.*

*A Shorrock supercharger was also the recommended Stage 4 in the factory tuning book for the 'TC' Midget.*

*So, in view of their extensive experience we asked the Abingdon Development Department if they had discovered any snags to the use of a blower on a standard road car. They confirmed our view that the blower was in many ways kinder to the engine than extreme states of conventional tuning, but said that they had experienced more rapid piston ring and bore wear in blown engines. We'll keep an eye on this point and report on it in due course.—ED.*

### TREK RAISIN STRINE

some translations from the original on page 5

*Our Gloria Sarah Tidge = Our glorious heritage.  
Harps Four = Half-past four.  
Flett Ayre = Flat-out.  
Sinney to Mellon = Sidney to Melbourne.  
Strine Lair's Pee Record = Australian Land Speed Record.  
Bram = Brabham.  
Langanar Farms: Example reads, 'He cannot drive like Moss; he hasn't got long enough arms.'  
Half-eyes: Example reads, 'I've got to run on Pirellis; the scrutineers did not pass my R5s.'  
Flare: Example reads, 'He only spun off three times, but he got the Black Flag, so we put her on the trailer and went back home.'*

Reprinted from 'Safety Fast'  
Vol. 8 No. 6 June, 1966

