

**Mini-Cooper (Spec. 1152 c.c. TR5)
SPEEDWELL CLUBMAN '80' ENGINE**

SPEEDWELL

ROAD TEST REPORT

Road tested by John Blunsden and reprinted from "Sports Car", December 1962.



Mini with the lot—even including radio! This fully equipped Speedwell version retains the normal Cooper Mini suspension, apart from different dampers and an anti-roll bar at the rear. But an 82 horsepower engine makes it enormous fun on the track. (John Blunsden testing at Brands Hatch).

A 109 mph SPEEDWELL MINI

SUCCESSFUL SPRINT CAR IS ALSO AN ENJOYABLE ROAD MACHINE

In Britain, enthusiasts have long since stopped marvelling at the performance which can be obtained from a Cooper Mini. Today, it is taken almost as a matter of course that the best tuned examples will be tagging on behind the 3.8 Jaguars, and on the tightest circuits, even mixing it with them. In rallies they are just as successful—perhaps even more so—and in Sweden they seem to be gaining a following as enthusiastic as that for SAAB, which suggests that they are well able to cope with the rough stuff, when they are suitably prepared for it.

But most of the important sporting events, both at home and abroad, are for Group 2 cars, and consequently there are important restrictions on what can be done to extract more power. It is usually in minor events, such as club races and sprints, that Group 3 cars can be used, and as the majority of Miniracers like to have an occasional crack at a more important event, the number of fully tuned Group 3 cars around is comparatively limited.

This is a pity, because a competent tuning specialist, given a free hand, can transform a Cooper Mini into a really potent "bomb", as I found out recently when I borrowed a car from Speedwell. This

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Internal changes to Ken Lee's Speedwell 'mini-bomb' include a competition seat, electronic rev counter, combined water temperature and oil pressure gauge, separate oil temperature gauge and (hidden to the right of the radio) an air slide for the Amal carburettors.

was not a specially prepared test car, but one owned by a customer, which had been back at the works for an end-of-season check-over and service, after six months of sprint-type competition in the North.

The body sides carried the motifs 'Teeny Speedwell Yorkshire', and apart from the 'Speedwell' badge on the back, the extra safety clip on the engine cover, a sticker on the rear window, and the lack of wheel covers, this looked just like any other green and white production Cooper Mini. Inside the deception was carried further, for the car was fully trimmed and carpeted, and it even had a heater and radio! The small hint of something out of the ordinary came simply from a rev counter, a combined oil pressure and water temperature gauge, and an oil temperature gauge. There was also a matching competition-type seat, a combined diagonal and lap strap, and tucked away beneath the fascia on the right side was an air slide for the Amal carburettors, replacing the normal pull-type choke.

The car is owned by Ken Lee, who has been having a very successful 1962 season, mainly at BARC events. His score sheet includes six 'firsts', including four new sprint records, and apparently this car has been the cause of some spirited rivalry between Cooper Mini owners in the area!

The Lee car has been progressively 'breathed on' throughout the year, to stave off ever-growing competition, and when I tested it it had 'the lot'. Yet remarkably, it was still a most usable road car, which indeed is its major function, the car having covered some 11,000 miles already.

The engine modifications include boring out the block, and fitting 67 mm pistons (made in Germany) to increase the capacity to 1,152 cc. The normal cylinder head has been discarded and replaced by a Speedwell Clubman-type light-alloy head, plus a special camshaft and valve gear. The engine runs on a compression ratio of 11.5 to 1, and as mentioned earlier, the fuel is fed through a pair of Amal carburettors.

There is a special flywheel, having only 50 per cent of the moment of inertia of the standard components, and the con rods are hand picked, machined at vital points, and crack tested. The bottom end has been 'beefed up' by strengthening the main bearing caps—this has been achieved by machining off the caps, and surrounding them with steel straps which are bolted down with longer

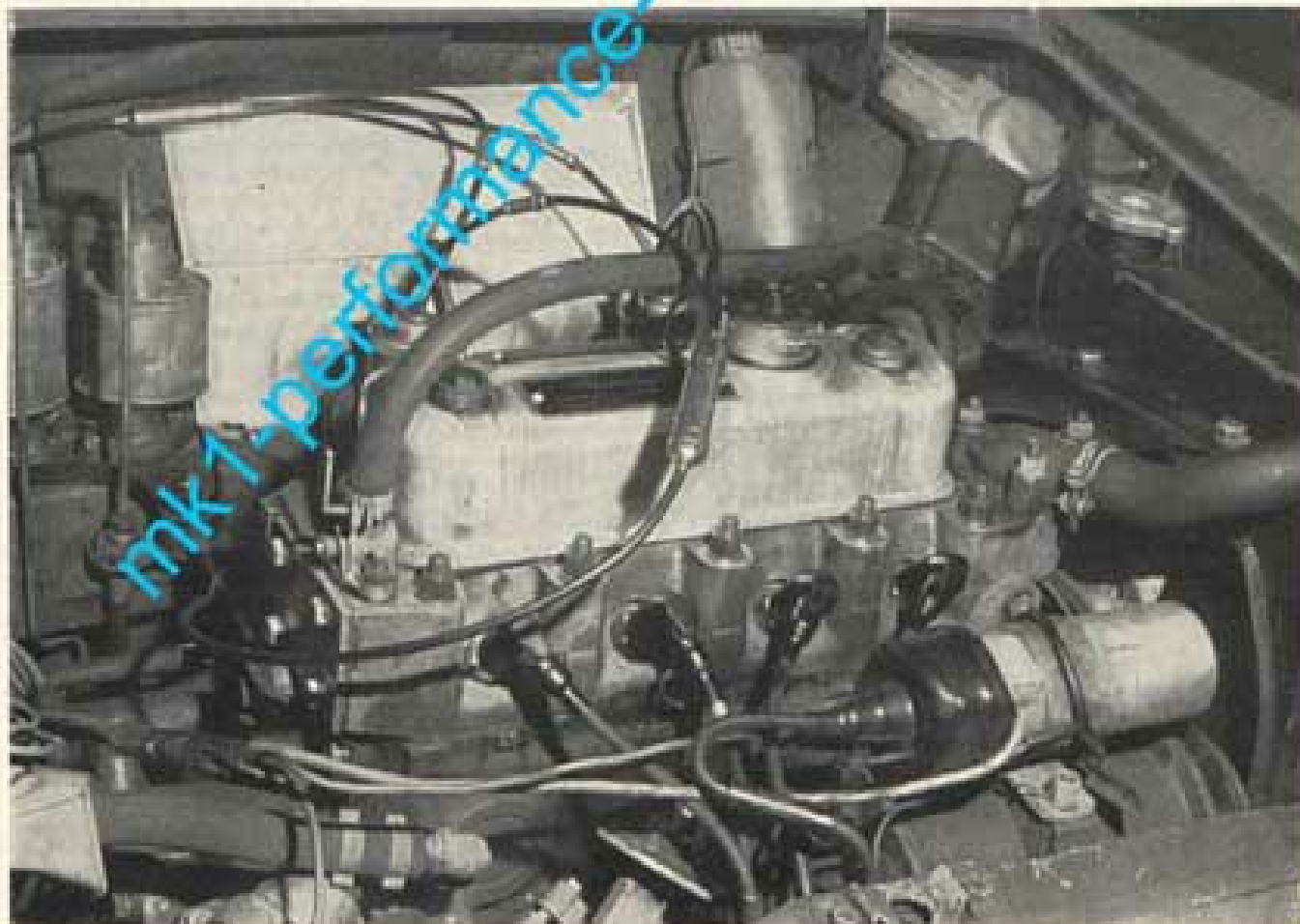
bolts. A lot of time is spent on profiling and finishing off the cylinder head, and the result is a unit which can be revved for short bursts up to 7,500 rpm, and which delivers 82 horsepower at 6,000 rpm, and 71 pounds feet of torque at 5,000 rpm.

The full conversion also includes lightening and balancing of all rotating parts, a special oil pump and an oil cooler. The suspension is basically unchanged, although a rear anti-roll bar and adjustable telescopic shock absorbers are fitted. The supplementary instruments mentioned above are also included in the conversion, which is marketed at £240. Alternatively, Speedwell offer a road-going version of the same conversion, costing £195. The main differences are that on the road-tuned car there is a lightened production flywheel, giving a 23 per cent reduction in moment of inertia, and the work on the bearing caps, hand selection and machining of rods, and final finishing of the cylinder head is not taken quite so far.

Ken Lee's Cooper Mini is run on Castrol 'R', and as regular competitors will know, this calls for a carefully controlled starting procedure. The Amal air slide is fully closed, the starter operated, and the throttle opened up very slowly. As soon as the engine fires, the lever is moved to the half-way position, and the engine is allowed to warm up at 2,000 rpm. The racing oil being thick, the oil pressure takes some time to build up, but as soon as it reaches about 40 psi the engine can be opened up. About a mile of running is necessary from cold before the air lever can be opened completely, and from then on it will not be needed for the rest of the day, unless the engine is restarted after several hours in around zero temperature.

The big advantage of boring out, of course, is that it gives the opportunity for a lot of extra performance to be obtained without making the car unpleasantly intractable. In this case, although peak torque is not obtained until 5,000 rpm, the pulling power necessary for normal road use is available as low as 2,000 rpm, or even lower, so that the car can be driven in heavy traffic just like the standard production car, with the possible exception of a higher tick-over speed.

Not surprisingly, prolonged low-speed running results in some stiffness when opening up again for the first time, but usually this soon clears - and the engine regains its usual crisp note. On two



Speedwell's 1,152 cc Group 3 'Clubman' engine has a light alloy head, and twin Amal carburetors. It is lubricated with Castrol R.

occasions, however, a plug was 'lost'. The first was after a really hectic traffic jam, and the other was due to inadvertently over-filling the sump when topping up with 'R'.

Pleasantly surprising, was the subdued exhaust note when the car was being driven normally; it is only when the needle is pushed beyond the 4,000 rpm mark that something of a bark accompanies the sweet-smelling exhaust cloud from the tail pipe. Even though the test included a lot of high-speed driving, the oil consumption worked out at close on 200 miles to the pint.

At very low speeds, the separate firing impulses could be detected, but once under way the engine gave no hint that it was running on such a high compression—the value of a light alloy head. There was a rough patch from about 3,200 to 4,000 rpm, which was transmitted through the gear lever in the form of a violent rattle, and this was probably due to the fact that the engine had had to be stripped and rebuilt very quickly between events, and there had been no time in which to regain the former balance.

Beyond this mark the unit was much smoother, right up to peak revs. Quite a careful watch has to be kept on the needle at the top end, because the punch between 4,000 and 7,000 rpm is surprisingly good. Fortunately, there is a considerable build-up in mechanical noise beyond 7,000 rpm, and this is a useful warning that it is time to change up! Speedwell recommends that 7,500 rpm should be used only momentarily, and although the engine still sounds in good shape then, I found that there was no real point in pushing the needle beyond 7,200 rpm. Using this limit, the top speeds in first, second and third gears are 36, 60 and 84 mph, which seems useful enough by any standards!

A reasonably long stretch of clear road will allow 6,500 rpm to be seen in top gear, and this corresponds to just under 104 mph, while with the aid of a slightly favourable grade I saw 6,800 rpm which is no less than 109 mph! I might add that the road surface was not completely dry for this, or for the acceleration runs, and in perfect conditions a slight improvement would have been likely. The comfortable engine speed for sustained cruising seemed to be about 6,000 rpm, or just a little more, which is not so very far short of 100 mph. (Top gear speed at 1,000 rpm is 15.9 mph). Naturally, more than usual care must be taken with the Mini when using very high speeds, in view of the ten-inch diameter wheels, and the tyres (Dunlop C41s with tubes were fitted for the test) should never be run below 40 psi for fast motoring.

Being a dual-purpose car, the suspension settings had not been changed, and undoubtedly track performance would have been enhanced by lowering the suspension the full amount. But this would have resulted in an uncomfortable road car, so Ken Lee's compromise is probably the best one in the circumstances. With an inherently understeering car, an increase in engine power can only serve to exaggerate the understeer. The rear anti-roll bar has helped somewhat to keep this within reasonable limits, but I noticed, particularly on a wet track, that the right foot has to be played very delicately on sharp bends if the car is to be kept on line. When it is really slippery it is possible to put on lock, then travel in a zig-zag simply by playing with the throttle!

On public roads, and driving in a rather more restrained fashion, the car handles very well indeed, and it is a delight for a really fast cross-country journey through twisty minor lanes. The technique for this seems to be to let engine power build up the understeer slightly, then steer accordingly, so that if you have to lift off the car will automatically tighten its line. On right-hand bends, this can be countered by taking off lock, while on left-handers, it automatically pulls you close in to the side. The disc and drum brakes were well able to cope with the car's speed, and the only complaint on this score was that the discs persisted in squealing, especially when they had become hot. Not a very comforting feature for pedestrians close by!

Apart from the gear lever rattle, the gear-box was in fine form after its season's hard work, while the clutch still had a light action, and a quick release, which even enabled bottom gear to be selected cleanly when moving slowly.

This is a remarkable little motor car, and as a fun machine it must have few peers at the price. Ken Lee has proved that, as long as you are happy to concentrate on the smaller type of event, your commuting transport can also be a competition class winner one day, a plaything the next, and the source of a lot of enjoyment all the time. Vive Group 3!

JOHN BLUNSDEN

ACCELERATION PERFORMANCE

0-30 m.p.h.	3.2 seconds	0-60 m.p.h.	8.8 seconds
0-40 "	4.6 "	0-70 "	11.6 "
0-50 "	6.4 "	0-80 "	15.6 "