MOTORING PLUS

Downton-in tune with the times

"According to some people we've been going bankrupt for 27 years — ever since Daniel and I opened the business with all of £50."

So explained Mrs Richmond, the personable managing director of one of the best known performance engineering concerns in the business, Downton Engineering of Downton, nr Salisbury, Wilts.

Maurice Rowe and I had driven down to collect the Downton-prepared 1750 Allegro Sport which I shall be using in next Tuesday's Total Economy Competition to be held over 38 laps of the Brands Hatch Club Circuit. Her wry reply was to my question regarding the healthy state or otherwise of her performance tuning business, especially since the ravages of the Fuel Crisis and the general paucity of money that seems to exist. Well, I haven't got much, have you?

The truth of the matter is that the Fuel Crisis did have an effect on the company's fortunes, for although in true family spirit the employees chose to work a five-day week, despite heating and power restrictions, like most engineering concerns they were partially defeated by a lack of component parts. Downton's long-established links with British-Leyland (they produce all the performance parts for Special Tuning at Abingdon) were at their most strained during this time, a period when cylinder heads, to name but one aspect of a very broad operation, often failed to get through.

With the livelihood of 25 workers to consider it was something of a black period. And Mrs Richmond hasn't really emerged fully into the limelight because the sudden passing quite recently of her much respected husband, Daniel, has brought forth more problems — like the vast sums required by the Inland Revenue as Death Duty.

Her reaction to the problems has been masterful under the circumstances: to consolidate and streamline operations so that the business is not only running more smoothly, but is enjoying greater productivity. Allied departments once fragmented throughout Downton's three-acre site, have been integrated under common roofs to speed the workflow and cut down expensive overheads, leaving a desirable one-acre site free for lucrative development should the need ever arise.

One of the firm's greatest mainstays throughout the general period of contracting business has been Downton's long-recognised tradition for combining increased performance with better fuel economy. Practically every Downton conversion we've tested has borne this reputation out. Another key factor is that the conversions are very competitively priced. Their initial DIY economy kit for most Austin-Morris cars costs only £8.45 and is said to be good for an extra 5 mpg between 30 and 60 mph when fitted to a Marina 1.3.

This kit comprises a special adaptor between the inlet manifold and the carburetter plus a free-flow exhaust silencer. An outlay of £159.05 (including the cost of fitting and testing) will endow any sober 850 Mini with a greater performance than a standard 1000 cc Clubman, while £184.25 will provide a 1275GT with a whopping 77.4 bhp at 6000 rpm and an identical lb ft torque figure at 3500 rpm. The same goes for Marina and Allegro 1300s.

There's no Austin-Morris or MG car which escapes their magical touch. You name it, they'll do it — to full race spec if needs be; remember the supremely successful Downton-prepared John Rhodes' Mini back in the '60s?

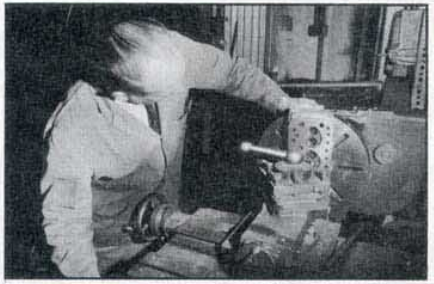
Most of the performance mods include the fitting of an exchange cylinder head which will have been shaved for an increase in CR, will have had the ports profiled and bigger valves installed. The inlet and exhaust manifolds will also have received the polishing treatment, the exhaust system will have been gas-flowed and a carb change wrought if necessary. Everything can, of course, be bought off the shelf but fitting and testing seldom adds more than £25 to the bill.

While Maurice and I were there Ray Shepherd, Downton's ace development man, was supervising work on one of five N-reg Wolseley 2200s, fitting a triple carb set-up complete with modified head and plumbing. The lucky owner was shortly to receive a bill for £235.15. But then in return he'll be getting 0-60 mph acceleration only fractionally slower than that of an XJ6, and fuel economy which, at 100 mph, will knock both the performance of the standard car and the Jaguar into a proverbial cocked hat.

No wonder they're succeeding where so many others seem to have failed!

Tony Scott

Top: Mrs Richmond in Allegro outside the smart Downton premises. Left: careful welding of exhaust down-pipes

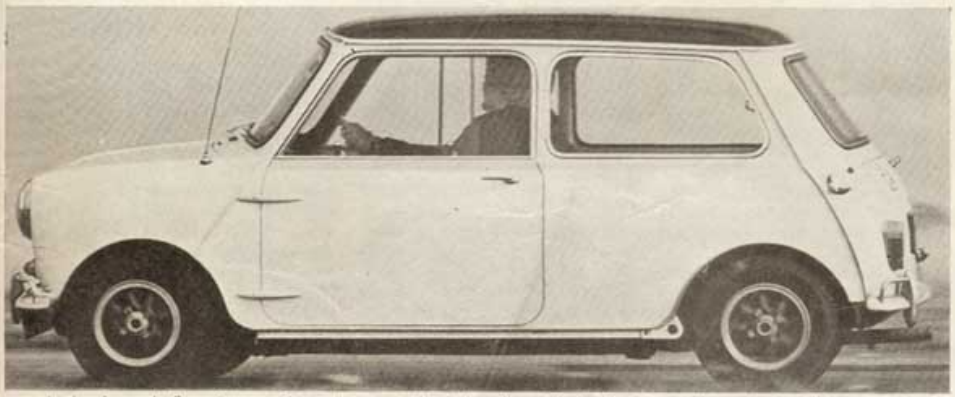


Left: careful machining of heads. Below left triple SU carburetter set-up. Below: cylinder heads for both fours and sixes waiting delivery

Top: reassembling a Wolseley 2200 engine. Above left: measuring combustion chamber capacity with a pipette. Left: bread and butter work is supplemented by the unusual

A MINI-S+

A Gordini R8. But read what happens when Daniel Richmond breathes fire on the S itself!



Acceleration on the £100 Downton Cooper S conversion bends the radio aerial, though the set remains perfectly audible at 100mph-plus

L to r: Sophie, 777, Samantha, Daniel R

On £100 Mini-bomb, big SUs are clue

Inside 777, dash incorporates tachometer

JUST OVER FIVE YEARS AGO I set out to road test what was supposed to be the first 100mph Mini. A few hours later I returned at the end of a tow rope; the timing chain had broken. Now 100mph Minis are commonplace, and the really keen tuners are talking of 130 – still from the same basic four-cylinder engine. I haven't achieved that yet, but I *have* done over 120mph – and 0–60 mph in six seconds, if you please – in a group two Downton Cooper S. And I've driven the same car through rush-hour traffic without temperament.

I have also done 112mph, and 0–60mph in 7.8sec, in a Downton S for which the engine modifications cost only £100. Since the car in question was also quieter, smoother and more economical than the standard product I rate it one of the best conversions on the market.

Basis of Downton's £100 conversion, as tried in 777 MCG, is building the engine as it should have been built in the first place taking particular care to get the same compression ratio in each cylinder. Downton also vastly improves the breathing; 1.5in SU carburettors (instead of 1.25in) are instrumental in the process, extending the useful rev range with a mildly reworked camshaft. The net result is a power output of 104bhp at 6800rpm compared with 76 at 5800, and fuel consumption stays at 24 to 30 mpg however hard the car is driven (18–25mpg standard).

When it comes to going round corners the Downton Mini handles a little better and rides *much* firmer than a standard hydrolastic Cooper S thanks to lowered suspension (non-interconnected) and Koni dampers. A new hydrolastic car with competition suspension valves would probably be even better, but so far I've only tried one with standard valves – which is far too bouncy for its performance (it takes off over bumps which the Koni-damped car scarcely notices). And with the lowered suspension the steering is right up to racing car standards, which means that nothing more than an inclination of the wrist is required for main road bends. Even so, a child can still turn the wheel from lock to lock with the car stationary. Such lightness can be useful even to an enthusiastic driver for parking and unparking.

As with performance, handling and ride, the Downton Mini brakes noticeably better than the standard car thanks to Ferodo DS11 front pads and VG95 rear linings. (The main purpose of the VGs is to make sure that the back brakes don't lock on in an emergency, which the standard ones are apt to do in spite of the special valve.)

Inside the car the only really necessary departure from standard is a rev counter, which can either be fitted on the steering column using an SPQR bracket or housed in a very neat Dulles Dash nacelle. If you can't abide the standard perches you can specify Restall reclining seats, whose form-hugging backrests are awkward for shopping trips but fine for mountaineering, and if you want to be really sybaritic you can have extra sound-damping felt – though it's less necessary in the Downton car than the standard one.

Having decided that the Downton Cooperess was the ultimate in Minis, I was in for another shock when Daniel Richmond led me over to Sophie – his special racing car. This too is a 1275 Cooper S, modified as far as is permitted by the CSI's Appendix J, group two, and at the end of 1964 it held the 1300cc saloon car lap record on several British circuits. It has 12.7 compression, a BMC type 648 camshaft (100deg overlap), straight cut gears and a limited slip differential – hardly the ideal specification for a road car. Yet it is driven to most of its races, even foreign ones, and in fact is far more tractable than the works rally cars (CAR May) – a fact which can only be ascribed to what Daniel Richmond sums up as 'head work'. Whatever the reason, Sophie pulls strongly from 2500rpm (on a 3.4 axle) whereas Makinen's Monte Mini was not happy below 4000rpm, and that with 4.3 gearing.

Being pre-hydrolastic, Sophie too has lowered suspension and Koni dampers – and handles and rides like a dream. The limited slip differential is a bit off-putting at first, as it stiffens up the steering somewhat; but it really makes a tremendous difference to traction on tight corners. It was a help, too, when I recorded these quite astonishing performance figures – easily the best ever taken by any magazine

0– 50mph	4.4sec
0– 60	6
0– 70	8.2
0– 80	11.4
0– 90	15
0–100	19.8

I wasn't able to establish the absolute maximum speed due to a combination of weather (snow), traffic (heavy) and road conditions (twisty), but I got up to 7400rpm (120mph) in both directions and Daniel Richmond (supported by John Cooper, who was with him at the time) claims to have seen 8000rpm (130mph) in top gear. All this, of course, is accompanied by a great deal of noise – intake, exhaust and straight cut gears – and the general clamour even at 120 virtually warrants earplugs. Great fun, but nothing like as practical as 777 MCG – in which it is possible to listen to the radio at 100mph.

While I was at Downton I had a brief run in an MGB which did 90mph in second, 115mph in third and 34mpg! There was also an Austin 1800 with the same engine but with standard steering, which made it impossible to use all the performance, and a Motorway Morris 1100 which cruised very quietly at 100mph but handled rather like a sponge cake. By contrast an 1100 with modified 1275 S engine was very disappointing; it seemed to be down on power and had several vibration periods – all of which was attributed to the method of installation, in which respect there are considerable differences between the 1100 and the Mini.

And so, on some excellent scampi and a bottle of Pouilly Fuissé, I bade farewell to Downton, deeply impressed by the results which Daniel Richmond and his men achieve in such small premises and in such an unassuming manner. There's no doubt about it . . . that head work really pays. *David Phipps*

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The Downton Mini-Cooper S

Road test by JOHN BOLSTER

We now take the miracle of the Mini for granted. On all the circuits, the sight of Mini-Coopers travelling at well over 100 m.p.h., or overtaking larger cars with considerable ease, no longer brings a gasp of astonishment.

"Gosh, I'd like a Mini the same as 'the boys' use," says many an admiring enthusiast. Actually, these racing Minis generally arrive at the circuits on trailers. They are noisy and intractable, and quite unsuitable for little old ladies to take down to the village, with shopping and the milk bar in mind. Fun for a weekend, perhaps, they lack the creature comforts which one expects of one's everyday transport.

Daniel Richmond (right), of Downton Engineering Works, Ltd., has proved himself more than capable of producing really fast racing Minis. He has now set himself the more demanding exercise of developing a version which, while still doing well over "the ton", can also be regarded as a gentleman's motor carriage. The result is a car which, compared with the production model 1275S, gives a much more comfortable ride, is quieter, smoother, and uses less petrol. Will it still achieve 100 m.p.h.? Yes, on third gear!

The car tested looks very standard, which adds greatly to the pleasure of driving it on the road. It has a full Silent Travel outfit and an excellent radio, while the extra-wide competition wheels have not been fitted. The normal wheels give a much more comfortable ride, and though fractionally greater cornering power is valuable on the circuits, for road use it could only be exploited by a homicidal maniac.

The suspension is lowered and Koni dampers are fitted, at a cost of £25 10s. I have driven other non-Hydrolastic Minis which apparently had the same treatment but which pitched like a standard car. This one, which has a "plain" suspension system without inter-connection, gives a remarkably flat ride for reasons that are not apparent. No doubt long experience in setting things up results in this exceptional comfort, which is achieved without any loss of controllability.

Any 1275S needs an oil radiator and for a tuned one this is essential, at a price of £13 10s. The heart of the tuned engine is the cylinder head, which costs £45 on an exchange basis. The inlet manifold is £3 10s., with £21 10s. for the pair of big S.U. carburetters, type H4. The exhaust manifold is £15 and the special camshaft is sold at the same figure.

Lightening the flywheel and balancing it, complete with clutch and crank, costs 10 gns., with £4 extra for balancing the rods. A price of £55 is quoted for whipping out, rebuilding, and replacing the engine and gearbox of an existing car, and £30 10s. is the figure for reboring and fitting special pistons. A set of straight-cut close-ratio gears comes out at £15 15s. (very reasonable) and it's £7 to stuff them into the box. Other items include a rev-counter at £9 15s., but let's assume that you take a car along and want it brought up to the specification and performance of the road test machine. Including plugs, oil, gaskets, road test, the lot, it comes out at £284 2s. 1d.

The result of all this is a little car which is almost unbeatable, except on the motorway. The maximum speed of a very genuine, timed both ways, 110 m.p.h. is perhaps incidental, but the cruising speed of 100 m.p.h. is very valuable indeed. Daniel Richmond took the engine up to 8,000 r.p.m. when I was his passenger, but I kept a little below this awe-inspiring figure. All the same, I attained an easy 100 m.p.h. on third gear on many occasions, with 70 m.p.h. on second and a dramatic 50 m.p.h. on first. The car develops 92 b.h.p. at the front wheels, which means that

the engine is giving about 99 b.h.p. between 6,000 and 7,000 r.p.m. on a compression ratio of 10.8 to 1. The sensational top gear flexibility is due to a torque of over 80 lbs./ft. from 3,000 to 6,000 r.p.m. with a peak of 86 lbs./ft. at 5,000 r.p.m.

On the road, the little car is stable beyond belief, and seems almost immune from the effects of side winds. The gear ratios are high and close at 3.44, 4.27, 6.13 and 8.84 to 1. Nevertheless, tremendous wheelspin on a dry road is the main obstacle during acceleration tests. The graph tells the story, but a Mini which reaches 60 m.p.h. in 7.8 seconds, or 90 m.p.h. in 21.8 seconds, must cause some surprise on the road. Indeed, a driver who had paid much more for considerably less performance actually tried to push me over the central dividing strip of a motorway. The Downton Mini, with two wheels on the kerb, still succeeded in overtaking this unsporting adversary!

The little machine handles in the best Mini style. That the brakes are also remarkably smooth and potent must be put down to the Downton touch. Perhaps the most spectacular figures are those for fuel consumption, an incredible 40 m.p.g. being attainable at quite fast touring speeds. Driving absolutely flat on clear roads at 4.30 a.m., including taking all the performance figures with many standing starts, I was able to record 27.3 m.p.g., which is even more sensational in its way.

This well-behaved touring car is more fun than most sports cars. It's remarkably smooth and by no means noisy, while it travels easily at speeds which are normally in the province of costly G.T. models. Nothing could be more fun to drive, and a smooth engine must last longer than a rough one.

PERFORMANCE DATA

Performance: Maximum speed: 110.1 m.p.h. Speeds in gears: Third, 100 m.p.h.; second, 71 m.p.h.; first, 50 m.p.h. Standing quarter-mile, 16.6 secs. Acceleration, 0-30 m.p.h., 3.2 secs.; 0-50 m.p.h., 5.4 secs.; 0-60 m.p.h., 7.8 secs.; 0-80 m.p.h., 15.1 secs.; 0-90 m.p.h., 21.8 secs.

ACCELERATION GRAPH