Photography: John Colley

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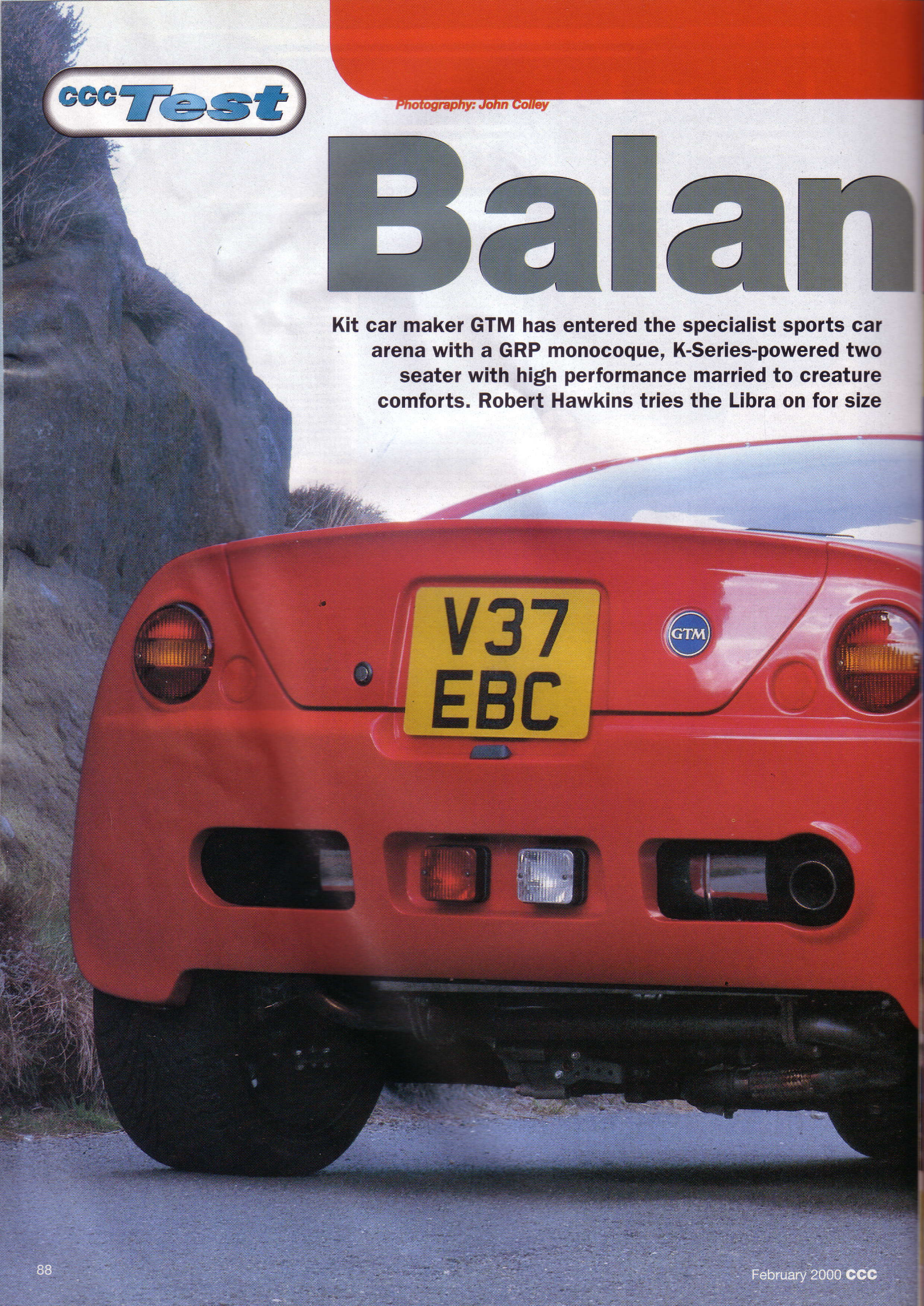
Kit car maker GTM has entered the specialist sports car arena with a GRP monocoque, K-Series-powered two seater with high performance married to creature comforts. Robert Hawkins tries the Libra on for size



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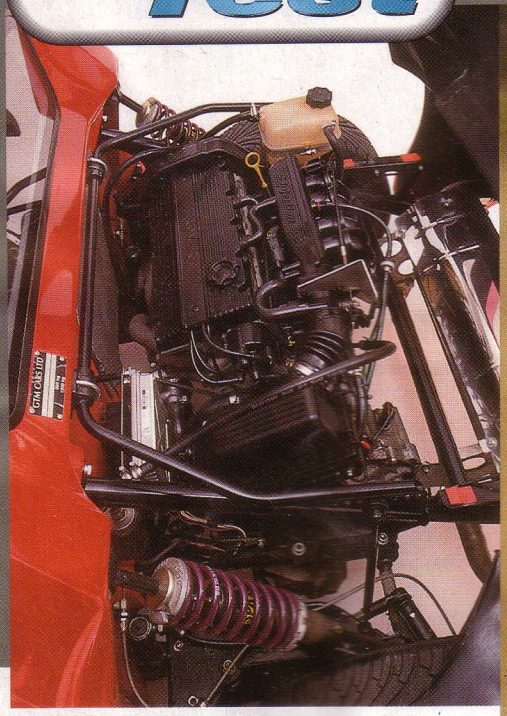
"We have developed our car over a four year period with what it probably cost Lotus to develop the door on the Elise," explains Paddy Fitch, one of the two directors at GTM who oversee a staff of six.

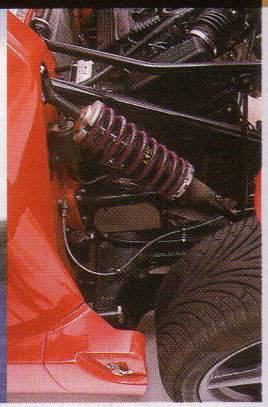
Working on rough estimates, a figure of a quarter of a million pounds is how much GTM has spent on developing its latest offering to the specialist sports car world. Based on a GRP monocoque (this is GTM's fifth) with a unique rear suspension, the Libra requires some 200 amateur-hours (GTM charge for 100) to bolt in a number of components from the Rover Metro to get it roadworthy. DIY costs are hovering in the 12K region. Ask GTM to do the hard work for you and prices start at £15000 with used bits, or £19000 with everything brand-new. Quite a lot of money when there are Elises and 21s on the market for not much more (and plenty in an established and inflated resale market). However, the final bill for a DIY job sounds tempting.

GTM appears to have a good reputation in the kit car world and sales to date have reached the fifty mark. If they can skim the surface of the specialist sports car world and poach some Elise owners for fully built cars, then GTM may experience a similar development to its rivals.

Under its current owners, GTM began in 1980. Directors Paddy Fitch and Peter Beck were apprenticeship-served telecom engineers looking for their own business. Peter was thinking about buying a GTM coupe. "GTM at the time wasn't doing very well," comments Paddy. "It was selling very few cars. We just saw it as an opportunity to get into something we wanted to do. It didn't have to be cars at the time. We bought up GTM in 1980."



The design brief for the Libra was simple "monocoque and radical." Suspension set-up (below right) hangs the wishbones off the monocoque, eliminating the spaceframe



Over the last 20 years GTM has sold over 350 coupés, produced a monocoque mid-engined Metro-based (initially Mini) two-seater called the Rossa (over 500 sold) and bought kit car makers Midas and NG in 1990. Prior to the Libra, GTM produced a 2+2 coupé under its Midas banner that is conventional in looks. Sales have not been as good as expected, which led to the Libra being a little more radical.

"We thought four or five years ago that all kit cars were getting much better," says Paddy. "Those kit cars that weren't replicas were becoming more like mass-manufactured cars. Also major manufacturers were bringing out more interesting cars, and still are. Our next car had to be something totally different, totally unique. That is what we've tried to do with the Libra - something you can't buy from anybody else."

GTM also looked at the Seven market and realised that there was an opportunity to steal sales. "The big disadvantage with these cars is that you can only use it for a few weekends throughout the year - for most people," explains Paddy. "There are die-hards, but the fact that they're difficult to get in and out of, you get wet when it rains and they're very difficult to go to work in if you've got to turn up smart. So we're hoping that the people who are buying Sevens will look at the Libra."

The design of the Libra, inside and out, was handed over to Richard Oakes. With the Rossa and Midas 2+2 under his belt (and plenty more, including the outrageous Beetle-based Nova), GTM supplied the brief: monocoque and radical. On the suspension side Bryn Davies was called in. Davies worked with Peter Beck to come up with the answers for bolting a rear suspension and engine to the back of a monocoque.

"The difficulty with a rear-engined car is that you can't really take the monocoque past the engine because there's insufficient room," explains Peter. "So you're left with either putting a spaceframe out the back and conventional unequal length wishbones on it, or rethinking the whole way of doing it. We tried to put the spaceframe out the back but, since you've got a big engine in there, you can't triangulate it very well. So we thought we'd rethink the whole idea and hang the wishbones in the opposite direction from the rear of the monocoque. It means the strength that we've got in the monocoque takes all the suspension loads without having to project it through a frame. It means that you end up with a very crisp design where you've just got a monocoque taking all the loads and eight wishbones hanging from it with coil-over shock absorber units."

That rear suspension has had many people scratching their heads. Up front, it's conventional (unequal length wishbones). At the back is where the questions start. "At the back it's very difficult to understand because it's unconventional," says Peter. "It has two trailing wishbones. It hasn't got conventional trailing arms at the back like a Metro or Mini, so the wishbones can be adjusted in their angle to each other to achieve exactly the same effect as two unequal length wishbones at the front. As the Libra rolls, the camber angle changes just as it does with unequal length wishbones. Equally we can achieve anti-squat at the back like we achieve anti-dive at the front, by just angling the trailing wishbones to each other."

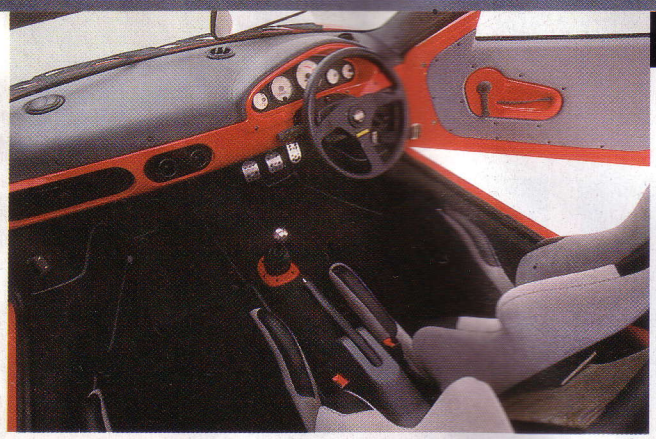
Coil-over shockers are used at the rear and are also mounted unconventionally – trailing and angled.

Hubs and brakes on the rear have relied upon past experience. Coupés and Rossas always used a subframe from the Mini or Metro, which provided disc brakes, but with the hassle of devising a handbrake and locking the steering arms. The Libra uses the Metro front hubs locked with an independent, adjustable link to the top wishbone. Handbrake is achieved via a Rover 200/400 rear caliper adapted to fit (pistons are smaller than standard Metros, so brake biasing isn't required). Similarly, the gearchange is GTM's own design, comprising a rod which runs under the car but is safely tucked out of the way of speed bumps (unlike on the coupé where the rod was the lowest part on the car).

Past experience also came in useful when designing the Libra's monocoque. A woven cloth layup ranging from 6 to 24 ounce layup is used to build the body tub. 26 box sections are then bonded into place for additional rigidity and to allow the suspension to be bolted on. No metal is bonded on to the shell. Instead, steel sandwich plates are used and access provided if corrosion occurs.

According to Paddy the stress test results for this 100kg monocoque are astounding. "We've been making monocoques for 16 years and have learnt over the years what sort of strength needs to be built in. We've overdone the strength and it's incredibly strong. We've done some tests in terms of the stiffness of the Libra and twisting the shell, and our test car is stiffer than the Elise." GTM boasts 14000 Nm/degree.

GTM's recommendations for building up a Libra start with the monocoque, where it is constructed with parts from the kit including pipes, cables, wiring loom and suspension (your own or a trim pack of interior bits can also be fitted). Next step involves the front end components (rad, heater, battery and more). Then the heavy work begins with the engine,



The mid-engined Libra maintains its neutrality in corners (above) and the acres of internal space ensures the driver is cosseted every step of the way (below left)

but luckily this doesn't require a hoist or crane (leave the engine on the floor and lower the car over it). Penultimate step involves the doors and then the finishing touches include the all-important one-piece front and rear panels.

CCC's testing of the finished product was very extensive. Tockwith Motosport volunteered its track for corner testing. SP Performance handed over an Elise for a comparison test. Derbyshire and North Yorkshire offered their roads for some country lane and sat-nav-style examination.

On the track the corner tests proved predictable for a mid-engined car when cornering at the limit. Turn in and power on for understeer. Power off or stamp on the brakes on a corner for oversteer. The latter test is the major worry for all mid-engined cars. However, it was difficult to get the Libra oversteering into a full spin. Coming out of a corner and allowing the Libra to self centre was completed with confidence.

Country road testing produced a few surprises. Large dips in the Derbyshire Dales were met with a crash as the Libra bottomed out – generally under the floor. GTM had not managed to achieve this (not many dips in Leicestershire where they're based), but Peter is currently looking into progressive bump stops and springs (current spring spec is 140/190 front/rear), possibly a better solution to stiffening the car at the cost of ride quality.

Rough roads feel lumpy and painful at low speeds. Take them at the national speed limit, however, and the Libra's suspension glides over just about anything (also characteristic of the Elise). With such a light car (700kg approx), take-off over crests was a concern, but I never managed to get airborn.

Cornering on the rough was equally impressive. No slide and no fighting with the steering wheel. Braking did, at times, provide an occasional waggle of the wheel. This can probably be blamed on a combination of causes – weight transfer to the front combined with the anti-dive set-up of the suspension and wide low-profiles (16 inch). Nothing too hair-raising, but you were made aware of it. Similarly, that anti-dive geometry took a day or two to get used to. The brakes at first felt very poor because the Libra's stance was remaining neutral when scrubbing

Kit Spec and Costs

Make and Model: GTM Libra
Bodyshell: GRP Monocoque with hinged front and rear sections.
Engine and gearbox options: Rover K-series as fitted to the Metro (1990 onwards), also MGF 'box and engine: sizes range from 1100 to 1800cc.
Front suspension: Double unequal length wishbones with inverted AVO adjustable shock absorbers and anti-roll bar. Built-in anti-dive geometry. Suspension travel is 60mm bump and 70mm droop.
Rear suspension: Double trailing wishbones with built-in anti-squat and anti-lift geometry. Inverted AVO adjustable shock absorbers, adjustable tie bars. Suspension travel is 70mm bump and droop.
Brakes: Rover Metro vented discs and calipers front, Rover Metro front solid discs with Rover 2/400 rear calipers and handbrake mechanism at rear. Servo-assisted, front/rear split.
Full kit price (can be split): £8800

Extras:-
Instruments, trim and seats on demonstrator: £1092
Wheels and tyres on demonstrator: £915
Metro donor parts supplied by GTM: £1500
Total build-up cost with all of the above: £12307
Time required for amateur build: 200 hours approx
Charge for GTM to build: £2000

Cost of 1400cc Libra with used parts, factory-built: £15000
Cost of 1800cc factory-built Libra with all new parts and Rover warranty on engine: £19000

GTM CARS LIMITED, TEL: 01509 852646

What's it all about?

Road car with race-spec handling capable of daily use and weekend fettling for club sport events. Radical styling inside and out with a good level of driver refinements. Expensive to buy complete with a yet-to-be-established resale market, but DIY build-ups are tempting. May appeal to Elise/Caterham owners wanting more creature comforts and something that few people will recognise.

off speed. Whilst the brakes don't feel as effective as an Elise or even an MGF, they were still safe and adequate.

The sensation of acceleration was initially numbed by the anti-squat set-up at the back. Take a couple of days to get used to it and you appreciate the benefits, especially over an Elise which simply kicks you in the back when you floor the throttle pedal. Moving up and down the gearbox was simple and smooth (less notchy than an MGF). However, the gear lever does feel a bit like a soup stirrer and there's a long throw between fifth and second (Peter at GTM pointed out that he can modify the linkage to suit).

Daily driving is thoroughly refined with limited wind noise, manageable engine tunes, masses of legroom, good-sized doors and plenty of luggage space behind the seats and in the boot. Even sunny weather can be appreciated with the targa roof. The outstanding design elements of this car both inside and out will certainly keep you and passers-by entertained.

There's not much ground clearance and the sound of GRP hitting tarmac isn't very pleasant. Similarly, when on full lock the wheels occasionally scuffed the inner arches. Knocks and rattles were aplenty – but find a similar car without such characteristics and you'll need to question your hearing. This certainly is a car for fettling. Raise the rear end and you've got acres of space to tinker over the engine. Severely damage the front or back end and all you need is £480+VAT for another quick bolt-on unit. Crack the windscreen and simply contact your local Fiat dealer and order the front glass for a Cinquecento.

Within the kit car world, the Libra is a competitive product, highly priced but with a name that will ensure steady sales matched with high resale values (GTM reckon £13-15000 for used cars). Pitch the Libra against the Elise, Caterham 21 and Seven owners wanting more creature comforts and a few customers will surely be enticed (certainly enough to keep GTM busy), despite high fully built prices and a yet-to-be-established resale market. GTM has set its sights on the turn-key market. With the likes of Lotus and Caterham already there, the road ahead is going to be tough. However, as a DIY job the asking price is pretty good and there is no doubting that the Libra looks the business ■