



TRACK AND RACE

# CARBS

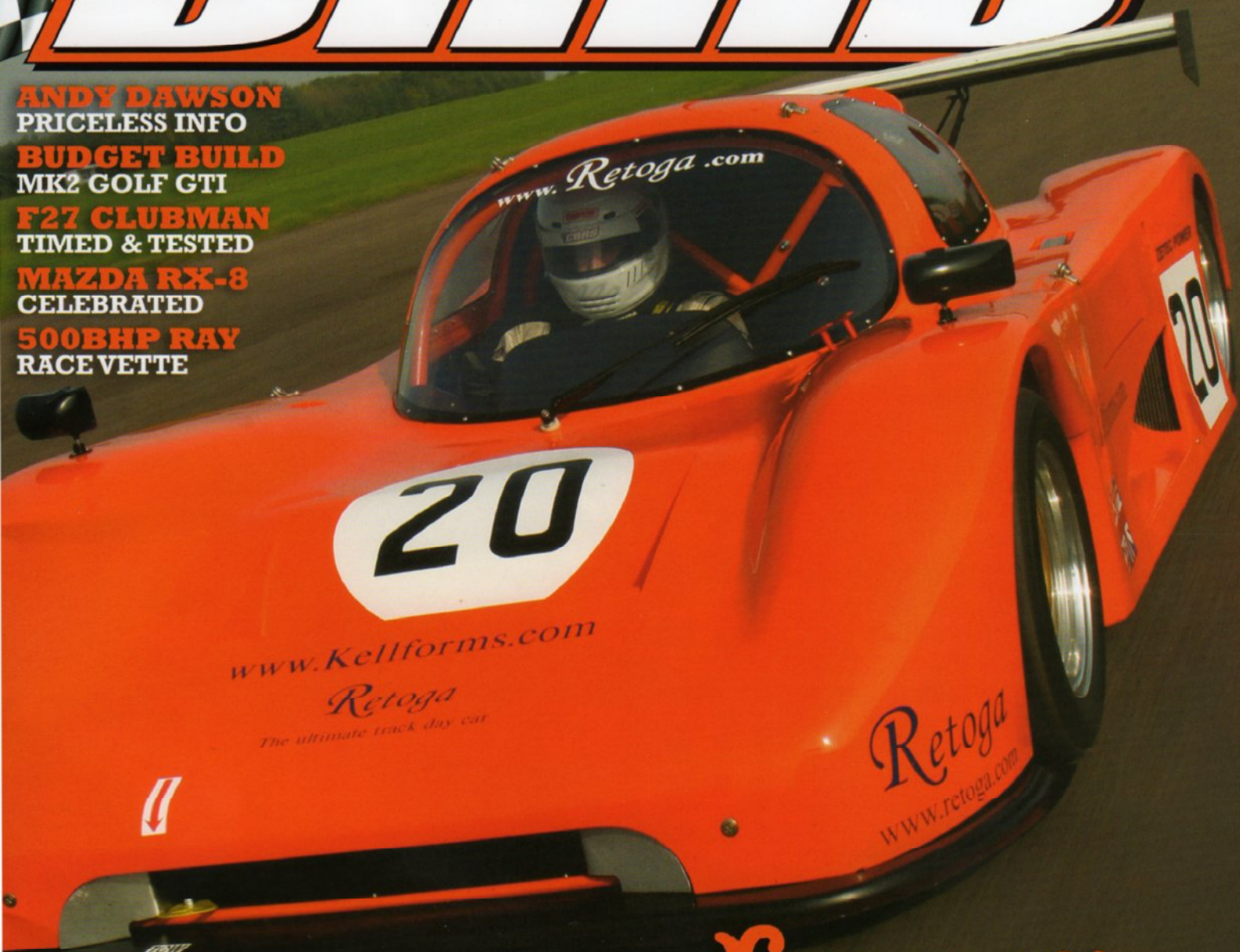
**ANDY DAWSON**  
PRICELESS INFO

**BUDGET BUILD**  
MK2 GOLF GTI

**F27 CLUBMAN**  
TIMED & TESTED

**MAZDA RX-8**  
CELEBRATED

**500BHP RAY**  
RACE VETTE



# Orangeboom

The first official shakedown of the rapid Retoga now with Sigma power and featuring a sequential transaxle



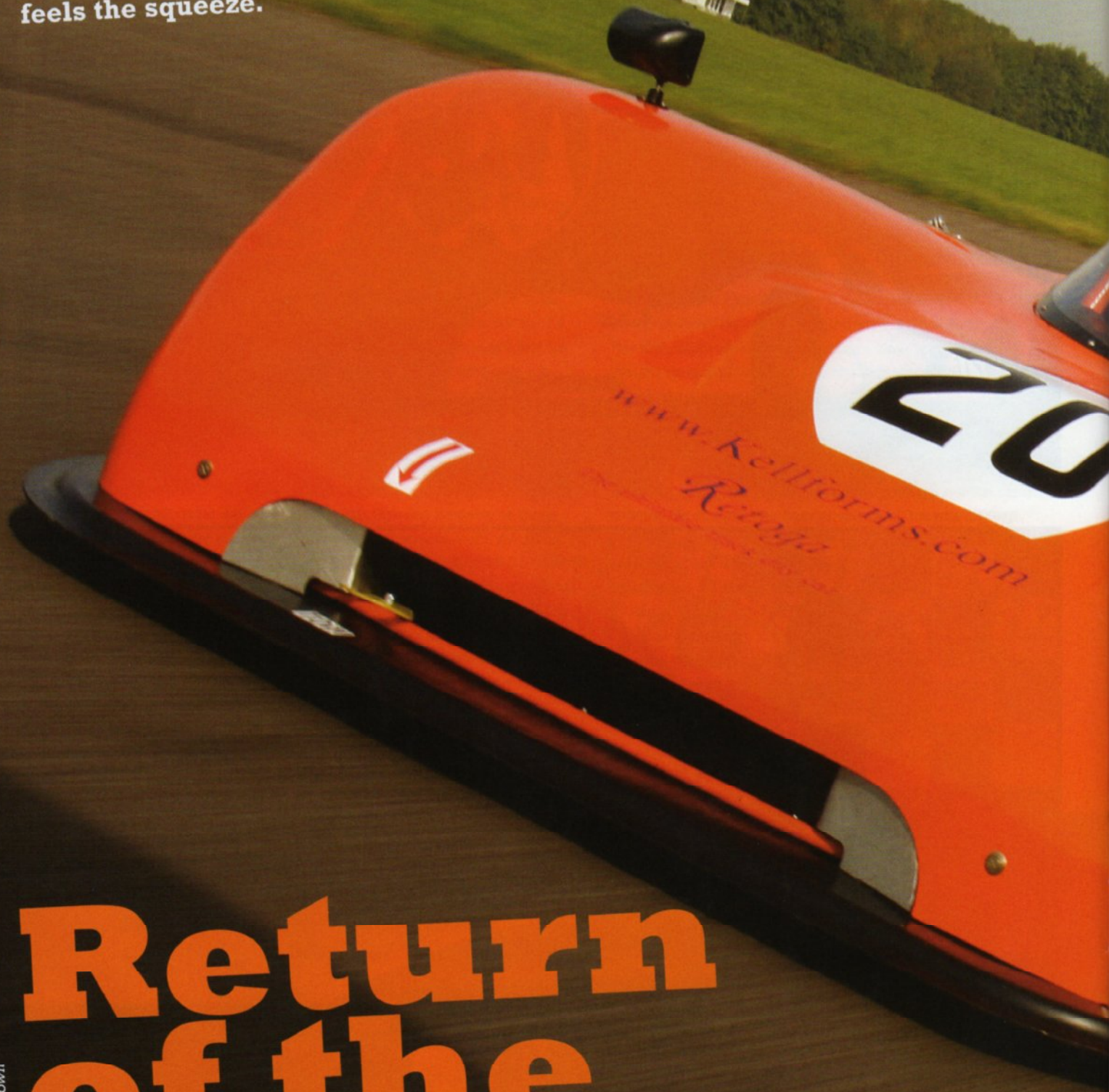
## SCORPION'S BACK

The San Remo Rally throws up more than gravel. We bag the first official test of the all-new road legal Fiat Grande Punto Abarth. Hold tight...

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Relatively unknown track day specialist manufacturer Kellforms has just lowered the bar to affordable and reliable sports prototype ownership with its new Retoga Sigma. Keith Wood feels the squeeze.



# Return of the Retoga

Photography: Andrew Brown

**I**f you care to trace back through the years as far as track day specials go the market has pushed the boundaries from 'purely track' to 'race' for an obscene amount of time. Ex-multi-sports race cars were first used on track days along with single seaters (before being banned) a long time before the whole sports prototype style bubble was created by none-other than the great Radical Sports Cars ten years ago. Taking a bigger step into road legal territory with its SR3 was a brave move and in turn inspired other manufacturers to bravely follow suit.

However it was a pretty pointless exercise. Yes it was fun, especially as I was lucky enough to enjoy some very lairy cars on the road, much like Westfield's XTR-4, but ultimately they were liked caged animals on the highways, just itching to

clip an apex. Okay, the suspension was softened, the ride height adjusted to avoid sleeping policeman and, in some, cases the power reduced but these were ideally race cars built for one purpose, to race. In fact, having the road setup actually took away from the true driving experience.

The result was hardcore track day enthusiasts arriving at the circuit with their road legal specials on trailers. Pointless? Well not when you consider that now probably some 30-40% of track day attendees will arrive with their 'toy' on a trailer. That 'toy' is also a special car for the job. The times are changing when experiencing the tracks in you're own road car is good enough, especially when you consider just how many times a year you could spend at the tracks.

I know because every month our sister title, Circuit Driver, has hundred's of dates for track

days from all the specialist organisers in the industry. In peak periods of the year (May, June, July and August) you could effectively spend a full week and then some at a number of different venues depending on how deep your pockets are. Come to think about it, if you include European dates you could seriously do months of non-stop track action. But, in your everyday car? Not me.

Which is where the likes of the track day specials step in, like the Retoga from Kellforms. A relatively unknown company in the public motoring circles Kellforms is in fact a key player within the Automotive and Aerospace industries. With 40 years of traditional pattern, gauge and model making skills combined with the latest Cad/Cam technology it provides some of the highest quality work in design, measurement and machining capabilities for its client roster



that includes giants such as Aston Martin, Ford, Jaguar, Nissan and Panoz.

So why the Retoga project? Well why not? Kevin Goater of Kellforms is a keen motoring enthusiast with hillclimb experience and a real passion for motor racing in general. He had a wonderful design for a body to sit over a two-seater chassis so in January 2005 commissioned Gary Gunn of Loaded Gunn Racing to design, manufacture and develop the prototype chassis and running gear to suit the dimensions. Before too long it was featured in this very magazine in the March 2006 edition, amazingly just a year after the project had started and screamed a delightful 150bhp Yamaha R1 yelp.

Since those initial developments and our first drive a lot has changed and for the better. I wasn't disappointed with the Retoga on my first drive but there were things that needed addressing. The biggest problem was the flimsy rear wing. It wasn't that it didn't work, in fact it worked too well, but because it was connected to the bodywork rather than the

chassis it actually broke. Take a look at the car now and you'll see a gorgeous and much neater attachment directly to the chassis.

The other problem was the lack of gear-shift feel, something that needs plenty miles of developing to get right when you decide to use the original bike gearbox. It can be remedied but it's not easy and one of the downsides of using bike power, as is the severe lack of torque. I couldn't help but feel that a four-cylinder car engine would work so much better in the Retoga chassis... And so we come to the latest incarnation of Kellforms special project.

The main chassis still compromises of the same light weight round tubular space frame design and is still tig welded and gusseted but all the anodised uprights, track rods and other small finishing touches are now achingly attractive to look at. Before it was almost a sin to remove the pretty bodywork but now it's just as attractive, especially when you remove the rear clam shell covering the new edition to the project, a 1.6-litre Sigma engine from Ford which

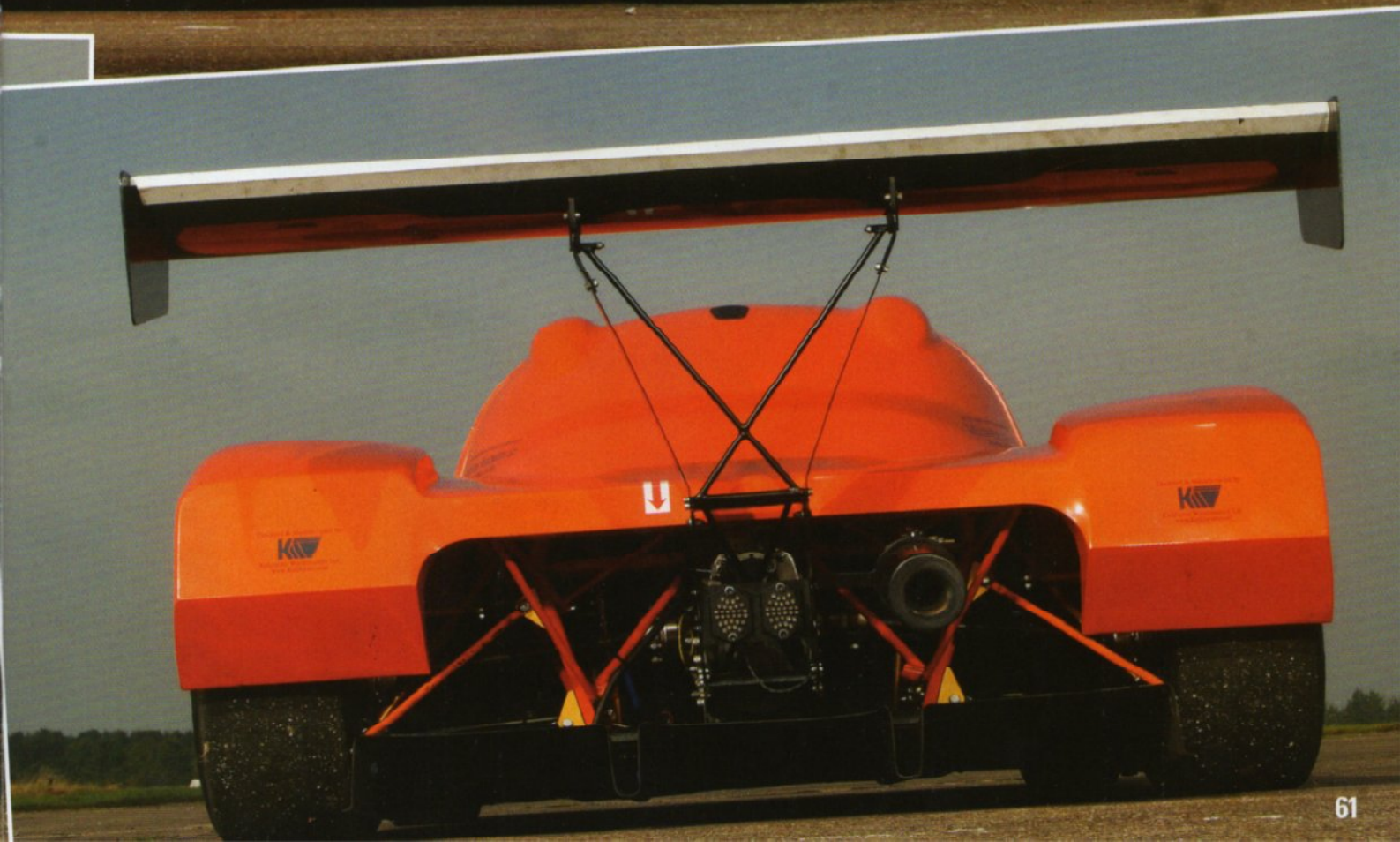
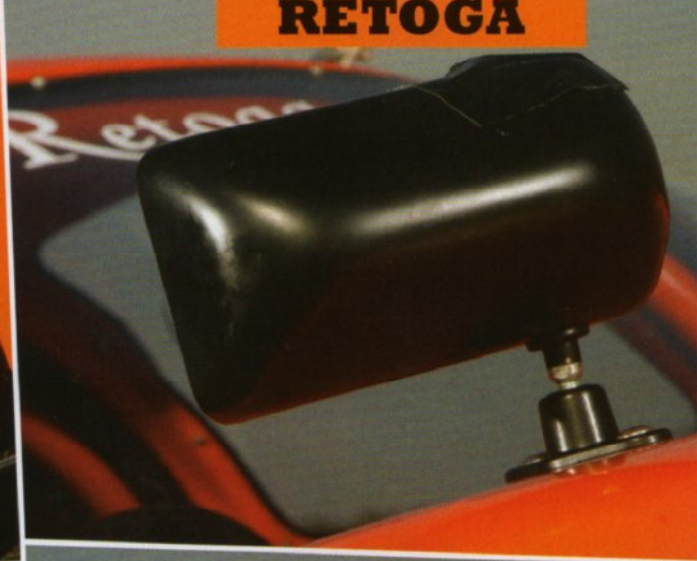
has been connected up to an Elite sequential transaxle.

It was always on the cards from the very beginning with Kevin dangling a carrot in front of me during our first test when there were talks about running a Duratec engine. Apparently the Duratec is a tad too big but the Sigma (as found in the latest Formula Fords) was a perfect fit and with throttle bodies the power rating of a solid 170bhp but with an impressive 145lb ft it was music to my ears. Sure the bike engine version was good but you can't beat a proper four-cylinder car engine, especially when you consider the torque figure is some 50lb ft over the R1 bike engine.

You also can't beat a real deal sequential gearbox and Elite's transaxle design fills the bill rather well. Called the TXL 200 it's a five-speed dog engagement system with reverse and comes wrapped in an aluminium alloy gear case to further reduce the weight of the overall Retoga package. In total we're looking at a flyweight 450kg. Even so it's still some 50kg up



**RETOGA**



**THE ATTENTION TO DETAIL IS  
QUITE SOMETHING AND IT'S  
HARD NOT TO BE HOOKED BY  
THE BEAUTIFULLY CRAFTED  
ROCKER ARMS**





on the bike engine model and that means, on paper, there really isn't much between the R1 model and this new Sigma engine version. Both are in the 370bhp per ton bracket.

Also the similarities don't end there either. The same astonishing four-piston AP Racing calipers are on all four corners with 10.5" ventilated discs and still hide behind the same 13" Image HT splitties although this time around on our test we were treated to Yokohama slicks rather than the usual 032R Advans. The same fully independent suspension setup is used on all four corners as are the single adjustable Protec coilovers mounted and tucked away behind the now anodised front bulkhead.

I know I've mentioned it already but the attention to detail is quite something and nosing around the front end it's hard not to be hooked by the beautifully crafted rocker arms and vast array of anodised goodies. These bespoke components are CNC machined from Kellform's highest quality materials at its High Wycombe facility to tolerances of  $\pm 0.02\text{mm}$ . They're as close to perfection as you could get and it shows the more you delve into the chassis.

It's been a year since I last properly looked around the Retoga and it's year of racing in a number of different classes and championships has really helped push the development game on. While the R1 engine Retoga has been playing among the Bike Sports the Sigma engine version has been busy with the Castle Combe GTs and although there hasn't been any race wins there has been an amazing amount of data collected and at much greater rate of knots over general track days. So as far as components go a new hollow front splitter/under tray is one of the improvements along with the reprofiled side ductings in the body and, as mentioned, there's a drastically enhanced rear wing.

It's a massively different car today and with the Sigma engine looks and sounds



so much more refined and solid. Unfortunately we're treated to the same tight fitting cockpit. Getting in is as tricky as climbing a wall while holding a 40" flat screen TV although once you're seated in position the wonderful fish bowl style windscreen is an instant relaxation tool. There have been talks of a slightly longer chassis (to increase cockpit space) and Kevin is also keen to place the seating position in the middle.

I'm totally in agreement. Sure the new dash pod that houses all the relevant dials and data are very neat and tidy but it seems the driver is unnecessarily made to feel awkward. Holding my hands at quarter to three my right knuckle was seated just millimetres away from the chassis tubing. Not exactly heart warming. Although it's not an over sight as such especially when you consider for guys with racing frames like myself, I'm under six foot and (relatively) slim,

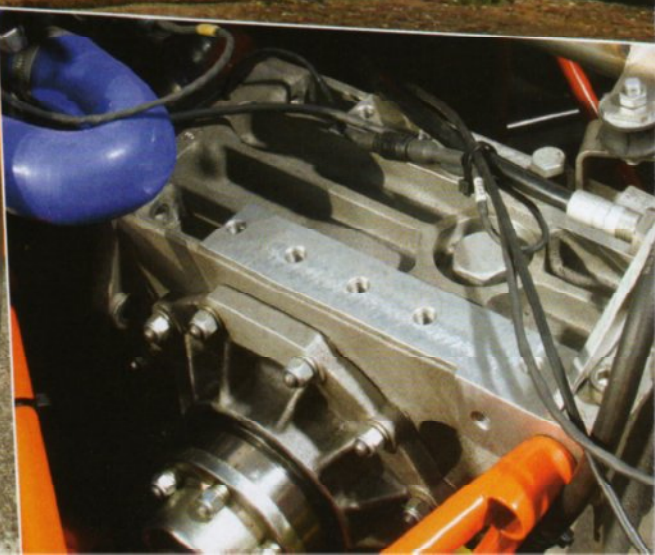
it's probably about right if you intend to have two people sat in the car.

Having the opportunity of handing out passenger rides is a big seller, personally I prefer to go it alone but I do appreciate the requirements of others. However it seems sensible to move the driver into the middle. Sure getting in and out will be easier but personally I believe helping the driver feel more comfortable behind the wheel should be a priority and the fact the Retoga includes adjustable pedals and steering to accommodate different height drivers, along with a quick release steering wheel, is certainly a step in the right direction.

But it's still a work in progress and one of the main areas it needs developing is the cockpit and weather-proofing for the driver. Sure it's got a roof, a huge selling point over its competition with open cockpits, and even a wiper blade but

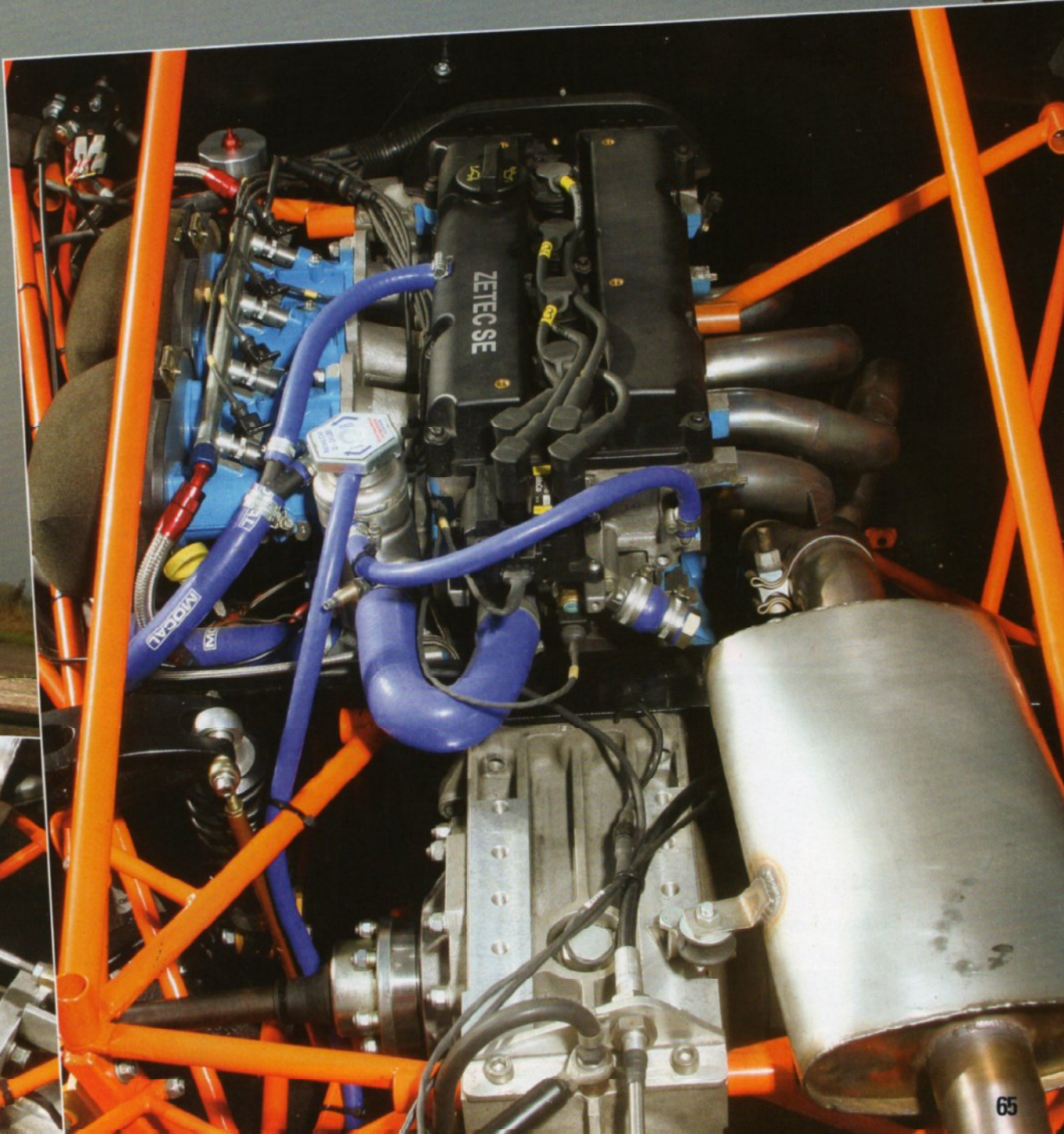
when I last drove it in the wet I got soaked. In fact I got wetter in the Retoga than I did the Ariel Atom and that's saying something. But to be fair to the guys at Kellforms it is an easy solution that has been addressed and will feature on future cars.

Which takes me nicely onto just how much a Retoga will be expected to cost you as a punter. Initially the whole idea of the project was to make it available to the kit car market and allow the owner to construct the thing from scratch. Kits start as little as £11,995 for a rolling chassis or just £13,705 factory assembled into a rolling chassis. From here the price then hikes somewhat into complete car figures. A complete kit including an engine and a factory built is some £33,000. but for £17,750 you could have it as rolling chassis less the engine and gearbox. Worth it? You bet, turn the page to see why... ♦♦





THERE HAVE BEEN TALKS OF  
A SLIGHTLY LONGER CHASSIS  
AND KEVIN IS ALSO KEEN TO  
PLACE THE SEATING POSITION  
IN THE MIDDLE



# DEBRIEF



**O**kay the important bit, how did it drive? It's a bit of an

adventure getting aboard but once I was strapped in (including the all important anti-sub strap) you're left with an amazing view. If you miss an apex or clipping point in a Retoga, shame on you because the only blind spot is what's directly behind you. Kevin did actually fit in a little rear view camera (it wasn't connected when I was driving unfortunately) so he could see what was coming up but you'll be lapping so quickly you won't need it anyway.

Anyway, as I dipped the tough clutch and gave the gear lever a good hefty tug there was a healthy metallic clunk to remind me that I was 'in' gear. To be doubly sure the shift display pops up the number 'one' in bright red led's and eagerly made my way onto the track. The stiff race setup had bundles of rebound and made the Retoga dart around eagerly

following any tramline like a hungry puppy hovering up a squiggly line of pedigree chum. As soon as I hit the track and the speed increased it suddenly became comfortable.

It was actually quite amazing over the lumps and bumps along the main the straight, particularly when hitting its top speed at the speed trap. It may seem flat but the right side of the main run way is rarely used, well unless we're testing, so it can gather dust at loose stones at times and unsettle our test cars, especially under braking for chicane three. I only managed two quick laps but during my first flyer I discovered a small problem straight away.

Under extreme braking conditions (like approaching chicane three) the car would grab on the offside front caliper first and tug the nose off in the same direction. On investigation it seems the brake line is shorter on the right side to the left, hence the offside clamping first. A simple T-piece and equal length lines are

needed and all will be cured.

As I continued with this in mind I punched in a 1minute 22seconds straight. Not bad but I was desperately trying to learn how late I could brake and with how much force. The Retoga had what seemed to be an almost infinite amount of grip with the rear wing obviously working overtime squashing the rear slicks into the tarmac. I braked too early and too hard on my first lap, it was obvious for me as I approached chicane one and had to accelerate again before I even made the turn.

You just never stop learning in these type of sports prototype style designed cars and since the fitment of the Sigma engine it certainly took me longer than I thought to soak up just how quick I was travelling. Without the bike engine it's a much more relaxed cockpit and every gear shift feels positive and purposeful, like a grown up more mature version than it's buzzy bike engine older brother which had me hanging on.

But it hasn't lost its excitement

that's for sure. With over 1G readings from lateral movements you're not left to rest easy and with near identical lateral figures this thing is efficient at going quick and stopping in a straight line as it is cornering. Not bad when you consider this is only 1.6-litres in capacity... It pulls you hard and quick through the rev range with only fifth needing a slight adjustment as it's slightly too long.

But what is its appeal? Well it's not a traditionally fun drive, say like you expect from the likes of the F27 over on page 70, that's for sure. No, this a much more sophisticated tool, one that will deliver you a pin sharp and rapid lap, time-after-time. Trying to judge how quickly you can take a corner can in some cases be more addictive than controlling a slide and that's what the beautifully presented Retoga Sigma is all about. The fact you have the option to then further yourself and race it should be the deciding factor in buying one. ■

## CONTACT

[www.kellforms.com](http://www.kellforms.com)

## ANALYSIS

<b>Sector 1:</b>	<b>17.28sec</b>
<b>Sector 2:</b>	<b>19.92sec</b>
<b>Sector 3:</b>	<b>16.90sec</b>
<b>Sector 4:</b>	<b>27.45sec</b>
<b>Start/Finish:</b>	<b>1m21.55sec</b>
<b>Max 'G' Reading:</b>	<b>1.11G (Lateral)</b>
<b>30-60mph:</b>	-
<b>50-70mph:</b>	-
<b>Speed trap:</b>	<b>131.15mph</b>

**RETOGA SIGMA**

**1.21.55**

**BLAZE HAYABUSA**

**1.23.51**

**ARIEL ATOM 160**

**1.24.64**

# TRC Test Track

2.057miles



**W**ith just 170bhp and a tad less torque it's no surprise the Retoga has found itself among some very heavy hitters in our table, namely the Lotus 240R, just thousandths ahead. It's main rivals though here are realistically the Westfield XTR4 and, of course the Radical 1100 Clubsport.

The Westfield has a mammoth engine in comparison and the 1.8T 20v Turbo unit is renowned for its torque - perfect for a short blast around the TRC Test Track. Radical, on the other hand, and it's Clubsport (which was its first creation...) relies on its lightweight and superb chassis dynamics. There's definitely room for improvement...

## The Quick...

CAR	ISSUE	POWER	WEIGHT	BHP/TON	LAPTIME
JP1	Jul '07	285bhp	650kg	438bhp	1m13.85sec
Radical 1100 Clubsport	Mar '04	185bhp	440kg	420bhp	1m15.21sec
Ariel Atom 3 325	Oct '07	325bhp	550kg	590bhp	1m17.60sec
Freestyle Caterham	Jan '05	215bhp	500kg	430bhp	1m18.67sec
Ariel Atom 2 300	Feb '05	300bhp	460kg	652bhp	1m18.75sec
Westfield XTR4	May '04	195bhp	620kg	314bhp	1m19.89sec
Lotus 340R	May '04	222bhp	650kg	341bhp	1m19.96sec
Stylus RT400	Nov '05	225bhp	550kg	409bhp	1m21.23sec
Lotus 240R	Dec '05	243bhp	930kg	261bhp	1m21.52sec
<b>Kellforms Retoga Sigma</b>	<b>Dec '07</b>	<b>170bhp</b>	<b>450kg</b>	<b>377bhp</b>	<b>1m21.55sec</b>

\* = Wet time

Fastest lap: 1m07.26sec - Juno SSV6