

TECH FOCUS: BAC MONO

Photos: BAC, Jakob Ebrej and Paul Lawrence



BAC MONO
Width: 1800mm
Length: 3952mm
Height: 1110mm
Wheelbase: 2565mm
Weight: 540kg
Price: from £74,950



A NEW GENERATION OF SINGLE-SEATER

The BAC Mono might have a number plate and be ready for use on the road, but under the skin it shares

technology with Formula Three machinery and will have its own racing championship in time for 2013

BY ROBLADBROOK
 RACING EDITOR

The BAC Mono caused quite a stir when it was first wheeled out in front of the public last July.

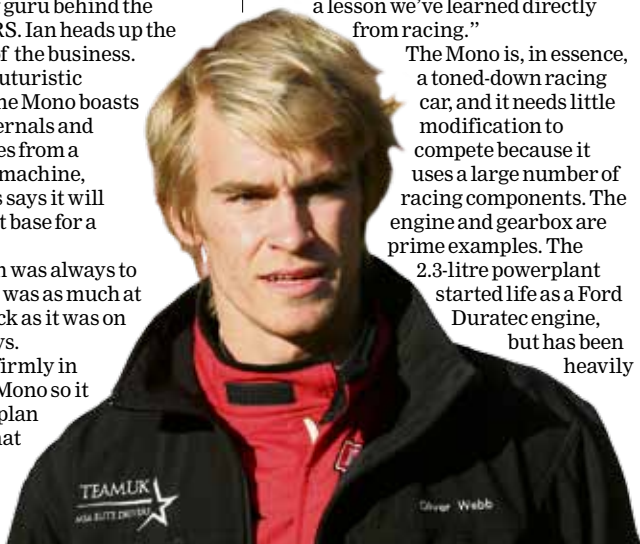
With futuristic sci-fi looks and a single-seater driving position, it looked and sounded like a formula racing car for the road. And that's exactly what it is. Except this racing-style road car is secretly a lot more racer than you might think. Next year, there will be a dedicated one-make race series around Europe for the car.

The Mono is the product of the Cheshire-based Briggs Automotive Company, or BAC for short. Founded in 2009 by brothers Neill and Ian Briggs, the company was formed for the sole production of the Mono. Neill has a long history working with Ford in both the road car and motorsport sectors and was the engineering guru behind the original Focus RS. Ian heads up the design aspects of the business.

Peel back the futuristic bodywork and the Mono boasts many of the internals and design influences from a Formula Three machine, and Neill Briggs says it will make the perfect base for a racing car.

"Our intention was always to create a car that was as much at home on the track as it was on the road," he says. "Motorsport is firmly in the DNA of the Mono so it was always our plan to create a car that

Webb is an F3 race winner



was suited to both. There's no denying that it's a true racing car underneath. "It had to be track-bred but we didn't want it to just be a trackday warrior. We approached the design of the Mono with one eye on FIA regulations, and another on road safety rules."

The Mono is a bit of a compromise. It's not as hardcore as a pure-bred F3 car. But that's not to say that it doesn't have sporting potential. BAC recruited Joel Allison, the former senior engineer at Juno Sportscars, to strengthen the car on the racing side. The Mono still wears number plates and it's violin-like shape helps drivers get in and out easily instead of running clumsy sidepods like an F3 car would, but aside from that there are little other clues to suggest it isn't a pure racing machine.

"We chose to use a formula-car layout because it's uncompromising and allows you to do so much with the suspension geometry because all of the weight is aligned in the centre of the car," says Briggs. "Having the driver in the centre helps things like braking efficiency and handling stability and it's a lesson we've learned directly from racing."

The Mono is, in essence, a toned-down racing car, and it needs little modification to compete because it uses a large number of racing components. The engine and gearbox are prime examples. The 2.3-litre powerplant started life as a Ford Duratec engine, but has been heavily

TECH SPEC
BAC Mono

Chassis: TIG-welded steel tube construction with carbon fibre layering. Carbon crash box and side impact protection. FIA compliant roll over protection
Engine: Cosworth 2300cc four-cylinder in-line 16V with forged conrods and Cosworth pistons. Dry sump oil system
Power: 280bhp @7700rpm (520bhp per tonne)
Torque: 206.5ft-lbs @6000rpm
Top speed: 170mph **0-60mph:** 2.8secs
Transmission: Six-speed sequential Hewland FTR with semi-automatic pneumatic paddle shift. Powerflow limited slip differential
Suspension, Front: Adjustable pushrod activated twin wishbones. **Rear:** Gearbox-mounted twin wishbones.
Brakes: AP Racing 295mm ventilated discs, four pot AP formula car calipers all-round. **Wheels/Tyres: Front:** 7.5x17" with Kumho V70a 205/40 R17. **Rear:** 8.5x17" with 245/40 R17



Webb is Mono's test driver

worked over by tuning giant Cosworth. It uses strengthened pistons and conrods and is also fitted with a dry sump oil kit, which allows the engine to be mounted lower inside the car, lowering its centre of gravity. Coupled to that BAC opted to include a six-speed sequential Hewland FTR gearbox, the same model currently used in both the British and F3 Euroseries. The unit is strengthened to increase reliability, but BAC does include an option to have the motorsport ratios set as standard.

The brakes are manufactured by AP Racing and are lifted straight from the Lotus Exige S GT car. Possibly the biggest cross-over between the two worlds is found in the suspension. The Mono uses the exact same twin-wishbone pushrod-activated system found in the current generation Dallara F3 cars and the suspension pickup points on the Hewland 'box have also been retained. The adjustable SACHS

Racing-developed dampers are the same model used in Formula Renault 3.5 cars. The set-up allows the Mono to handle on the track as a pure-bred racing machine. It achieves maximum tyre contact with the track while cornering and boosts its contact patch to the same area per square millimetre as a Ferrari 458. That's quite an achievement for a machine that's almost two-inches lower than an F1 car.

The suspension makes up for the lack of aerodynamics on the Mono, which is one of the most notable differences between the Mono and the F3 cars that inspired it. Road laws prohibit the use of a front wing on the road and EU rules dictated that it had to have a slim, low rear wing. That means that the Mono has to rely more on its mechanical grip, and Briggs says refining the balance between aero and speed was difficult. BAC worked with Stuttgart University in Germany and used Computational

Fluid Dynamics (CFD) design to perfect the bodywork. "Our aero package isn't geared towards maximum downforce," says Briggs. "Formula cars are quite clumsy below 50mph when the aero isn't working so that set-up wouldn't have suited the Mono. We had to find a mix between mechanical grip and having enough downforce to keep the car steady at high-speed. We also had to make sure the car could achieve a supercar top-speed and be aerodynamically efficient, but not have so much downforce that it upset the spring rates at low-speed. Currently more than 80 per cent of the Mono's total grip is mechanical and the extra traction is unlocked at speed."

To ensure the Mono handled like a racing car should, BAC drafted in British F3 race-winner Oliver Webb to be its official test and development driver. Webb says that while the Mono shares many characteristics with the F3 machines he's familiar with, the lack of

ENGINE

The Mono's powerplant shares many of the same design trends as current F3 cars. The 2.3-litre Cosworth unit is longitudinally mounted to keep the weight distribution as central as possible behind the driver. The unit runs a dry-sump oil system, which allows it to be buried deep inside the chassis and close to the floor, helping the Mono keep its low centre of gravity. It is linked to an F3-spec Hewland gearbox.



Duratec unit tuned by Cosworth

aero makes it more accessible to drive. "The Mono isn't aero-dependant like an F3 car is. You have to drive it more like a Formula Ford, but at F3 pace," Webb says. "A heavy aero kit wouldn't suit a car like this because if you slide an aero-dependant car the second you take your foot off the gas the downforce goes and you'll spin. Relying on mechanical grip means you can slide the car and hold it on the limit a lot longer."

"The Mono feels very predictable because of its grip level, but in terms of pace it's actually faster on a straight than an F3 car. It wouldn't keep up through the corners when downforce becomes a factor but it's an ideal platform for one-make racing. It's accessible enough to allow gentleman drivers to handle it capably, but it also



Suspension helps car grip

takes a lot of skill to drive quickly so it will be a test for professional drivers too. Because of its slippery shape the racing will all come down to slip-streaming."

Another thing in the Mono's favour is its weight. The entire car tips the scale at around 500kg. The chassis is a design that surprisingly stems from the world of touring cars with the steel and carbon fibre construction inspired by a DTM racer. BAC uses a layered carbon exterior, which is then wrapped around a steel safety cell for the driver.

The technique allows the car to have rigidity close to that of a full-carbon tub, but without the colossal bill that comes with it. The Mono also incorporates a raft of FIA approved safety features such as carbon crash boxes at the nose and comes complete

CHASSIS

While modern F3 cars are constructed around a full-carbon fibre tub, the Mono takes a slightly different approach. The core of the car is a tubular steel spaceframe, which is then wrapped in carbon fibre composite to add strength. This process helps keep costs down by avoiding a fully carbon body. The car maintains its low kerb weight through carbon bodywork. The car also features FIA approved carbon crash boxes, side-impact protection and roll hoop.

SUSPENSION

Without the wings an F3 car relies upon to produce its grip, the Mono has to cope with largely mechanical grip alone. The suspension set-up includes twin wishbones and pushrods to maximise the tyre contact with the road at all times while keeping the body level and pitch-free. The result means the BAC has the same contact patch with the track as a Ferrari 458.

with Formula One standard FIA-crash tested roll over protection. "We had the car FIA-certified early because we are keen to get the Mono out racing quickly," adds Briggs. "We've worked closely with both the Motor Sports Association and the FIA to ensure the Mono meets all of the safety requirements off the production line. We still have a small development to refine for the rear crash structure for racing, but we're very close to having the finished design."

Next year BAC is planning to run an eight-round race series dedicated to the Mono throughout Europe. Organisers hope to have famous venues like Spa Francorchamps, Monza and Silverstone on the calendar and double-header races are planned for each event although the race format and duration has yet to be decided. The first eight customer cars are due to be

delivered in the next few months and BAC is gearing up to produce more than 50 examples across the course of 2012. "We've gone down the single-make route because it's quite difficult to place the Mono in modern motorsport," adds Briggs. "While technically it would be eligible for GT4 racing, it doesn't exactly fit the blueprint of a GT4 car. We've seen the kind of issues KTM has had with the X-Bow, which has been handed unnatural weight penalties to slow it down. We don't want that for the Mono. "We recognise that the Mono won't be a step on the racing career ladder but it

will offer something new and exciting for graduates from series like Formula Ford, who want to try their hand at something a bit different. "We want to bring the Mono full-circle and returning it to the track achieves that because that's where so much of our design influence came from. "We've had lots of interest from drivers wanting one of Hillclimbs and Sprint events, and we're working hard to get cars on to racing circuits too in the near future."

BAC Mono: road legal, but it's a real racer

