

## Bloodhound SSC: supersonic showcase for engineering

The AMRC is taking a hands-on role with the Bloodhound SSC project, to help break the land speed record and encourage a new generation of engineers.

Bloodhound SSC is an ambitious UK effort to regain the world land speed record in a purpose-built car capable of reaching over 1000 miles per hour. The project is led by Richard Noble OBE, who took the land speed record in 1982 with Thrust 2 and led ThrustSSC, the world's first supersonic car project, in the late 1990s.



The Bloodhound car is powered by a Eurojet EJ200 engine, as used in the Eurofighter Typhoon aircraft, plus a Falcon hybrid rocket. A Cosworth CA 2010 Formula 1 motor pumps fuel to the rocket and provides power to the car's electrical and hydraulic systems. The car's body, chassis and control systems will meanwhile rely on a range of advanced design and manufacturing techniques.

As well as winning back the world land speed record, the Bloodhound team are aiming to enthuse a new generation about engineering, as the Thrust programme did a generation earlier.

"I was 13 years old when Richard Noble brought the land speed record back to the UK," says Phil Spiers, head of the AMRC Advanced Structural Testing Centre. "When the Bloodhound project was formed, I was keen to be involved and trained as a STEM ambassador to help spread the message about the benefit of science technology engineering and mathematics – I firmly believe that without a good skills base and future engineers, the UK will not be able to compete."

Spiers offered the AMRC's testing expertise and resources to the Bloodhound team, initially helping with spin testing of the car's carbon brake discs alongside member company Vibrant NDT. Other testing projects followed, including measuring friction in the front suspension joints, and calibrating the attachment ring used to monitor the thrust produced by the rocket engine.

"When the team from Bloodhound came and saw the incredible resource available at the AMRC, we were asked if we could help with manufacturing some of the parts for the car," Spiers says.



The AMRC's machining-focused Process Technology Group has now produced a number of key parts for the car, including gearbox components for the Cosworth auxiliary power unit. These have been milled from aluminium on the AMRC's MAG Cincinnati FTV5 2500 vertical machining centre.

Phil Kirkland, technical lead in the AMRC Process Technology Group, says: "The AMRC is well used to meeting the very demanding quality requirements of the aerospace industry for prototypes and one-off parts, and as such we were

confident we could produce these vital components to the required specification first time.

“We are also using this project to develop the skills of our young engineers who have been energised by the work, in line with the aims of the Bloodhound team.”

The AMRC group of centres is also producing other components, including the car’s rear sub-frame – a complex task which requires the large-scale machining capabilities of the Nuclear AMRC and the specialist services of member companies.

The AMRC is working with the Bloodhound team to encourage a new generation of engineers, and make sure that UK manufacturing continues to lead the world.

Richard Noble visited the AMRC Knowledge Transfer Centre in May to talk about the Bloodhound project, in a sold-out evening lecture organised by the new Sheffield branch of the Royal Aeronautical Society.

The same week, the Bloodhound SSC education roadshow arrived at the AMRC, with the 13.4 metre replica showcar on display next to the AMRC’s MANTRA exhibition lorry. Around 120 students aged 8-10 visited from local schools to get a taste of advanced engineering, and to test their skills building balloon cars and piloting the Bloodhound simulator.

“Being able to wow the young people may just spark some interest in the possibilities that can be achieved through engineering – it did for me at the age of 13,” says Spiers. “Thirty years on, I still love my job and am proud to work in manufacturing in the UK.”

AMRC engineers have also joined the Bloodhound team to promote the project at numerous events including the Goodwood Festival of Speed 2012.

For more information about the project, see [www.BloodhoundSSC.com](http://www.BloodhoundSSC.com)

