# 1,000 mph car to be built next year

November 23 2010, by Lin Edwards

(PhysOrg.com) -- The "Bloodhound SSC," a car expected to be able to travel at 1,000 mph (around 1,600 km/h) or faster, is on track to be constructed in the UK early next year. The design was finalized last year, as reported in [this PhysOrg article](link).

Director of the project, Richard Noble, who once held the World Land Speed record, said construction of the full-scale [car](link) will begin in January, and an attempt on the World Land Speed record will be made in 2012. The aim of the project is to promote science and engineering and to inspire young people. An extensive educational program in about 25,000 schools in the UK has always been part of the vision.
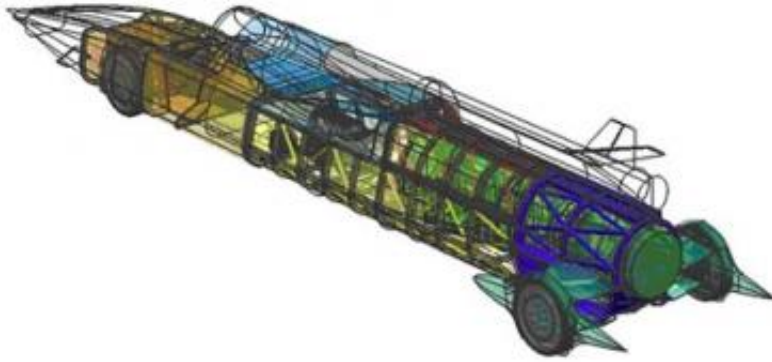
The car body will be made of a thin alloy, and the 90 cm, 97 kg wheels will be made of a solid aluminum alloy. Research aimed at selecting the best alloy for the job is continuing, but the choice will be important because the wheels will be rotating faster than any wheel in history, reaching 170 rotations per second (about 10,200 rpm), and stresses at the rim of around 150 megapascals.

The wheels will also be in contact with the lake bed, and so some surface damage is inevitable, but the alloy must not allow cracks in the wheels that could lead to their destruction, especially during the second run in the record attempt. Research on the effects of the impacts of grit on various alloy samples are being carried out at the Cavendish Laboratory at the University of Cambridge.

The vehicle will be powered by a Falcon rocket and an EJ200 jet engine from a Eurofighter Typhoon military plane. The jet produces nine tons of thrust, while the rocket produces an additional 12 tons of thrust.

EUROJET EJ200. Approximately half the thrust of BLOODHOUND SSC is provided by a EUROJET EJ200, a highly sophisticated military turbofan normally found in the engine bay of a Eurofighter Typhoon.

The World Land Speed record attempt will be made at a dry lake bed called the Hakskeen Pan in Northern Cape Province in South Africa. The Bloodhound will need to make two successful runs within an hour over a measured mile in order to break the record. The average of the two runs is the record speed, and not the fastest run. The team plans to swap the rocket motor for a fully primed rocket after the first run, but hopes to avoid needing to change the wheels as well.

The 20 km long, 1.5 km track for the record attempt must be completely clear of all loose stones before the run, as an impact with a 1,000 mph stone could cause catastrophic damage to the wheels or car body. Around 300 local people are already working on sweeping the track clean, and Noble has advertised in the UK for helpers, offering "No wages, constant heat, tough work in beautiful but remote Hakskeen Pan."

The Cosworth CA2010 F1 race engine alongside the full size BLOODHOUND SSC Show Car at the Bloodhound Technical Centre November 2010

The current record is held by the Thrust SuperSonic Car, which achieved 763 mph (1,228 km/h) in its record attempt in 1997. Three people who worked on Thrust are working on the Bloodhound: Wing Commander Andy Green, who will drive the car, Ron Ayres, the chief aerodynamicist, and Richard Noble, the director.

The project is well-funded, with Mr Noble saying there are more companies wanting to sponsor the car than they can accept, and even though the venture is private and non-profit, it has also received support from the UK government in the form of two Typhoon jet engines. Other major supporters include aerospace companies Lockheed Martin, Cosworth (manufacturer of the F1 jet engine) and Hampson Industries.