IS SPIRIT OF INNOVATION WORLD FASTEST ALL-ELECTRIC VEHICLE?

News / Manufacturer



Rolls-Royce believes that Spirit of Innovation aircraft is the world's fastest all-electric aircraft, setting three new world records. The manufacturer submitted data to the Fédération Aéronautique Internationale (FAI) – the World Air Sports Federation who control and certify world aeronautical and astronautical records – that at 15:45 (GMT) on 16 November 2021, the aircraft reached a top speed of 555.9 km/h (345.4 mph) over 3 kilometres, smashing the existing record by 213.04 km/h (132mph). In further runs at the UK Ministry of Defence's Boscombe Down experimental aircraft testing site, the aircraft achieved 532.1km/h (330 mph) over 15 kilometres – 292.8km/h (182mph) faster than the previous record – and broke the fastest time to climb to 3000 metres by 60 seconds with a time of 202 seconds, according to our data. We hope that the FAI will certify and officially confirm the achievements of the team in the near future.

During its record-breaking runs, the aircraft clocked up a maximum speed of 623 km/h (387.4 mph) which we believe makes the 'Spirit of Innovation' the world's fastest all-electric vehicle.

Warren East, CEO, Rolls-Royce, said: "Staking the claim for the all-electric world-speed record is a fantastic achievement for the ACCEL team and Rolls-Royce. I would like to

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thank our partners and especially Electroflight for their collaboration in achieving this pioneering breakthrough. The advanced battery and propulsion technology developed for this programme has exciting applications for the Advanced Air Mobility market. Following the world's focus on the need for action at COP26, this is another milestone that will help make 'jet zero' a reality and supports our ambitions to deliver the technology breakthroughs society needs to decarbonise transport across air, land and sea."



Business Secretary Kwasi Kwarteng said: "Rolls-Royce's revolutionary Spirit of Innovation aircraft is yet more proof of the UK's enviable credentials when it comes to innovation. This record will show the potential of electric flight and help to unlock the technologies that could make it part of everyday life. The government is proud to back projects like this to leverage the private investment necessary to unlock cleaner, greener aircraft which will allow people to fly as they do now, but in a way that cuts emissions."

The 'Spirit of Innovation' is part of the ACCEL or 'Accelerating the Electrification of Flight' project. Half of the project's funding is provided by the Aerospace Technology Institute (ATI), in partnership with the Department for Business, Energy & Industrial Strategy and Innovate UK.

The aircraft was propelled on its record breaking runs by a 400kW (500+hp) electric powertrain and the most power-dense propulsion battery pack ever assembled in aerospace. We worked in partnership with aviation energy storage specialist Electroflight and automotive powertrain supplier YASA. As well as a stunning technical achievement, the project and world record runs provided important data for our future electric power and propulsion systems for all-electric urban air mobility and hybrid-electric commuter aircraft. The characteristics that 'air-taxis' require from batteries, for instance, are very similar to what was developed for the 'Spirit of Innovation'.

Stjohn Youngman, Managing Director, Electroflight. "We are delighted to have played an integral role in this landmark project. Its success is a fitting tribute to the dedication and innovation of the Electroflight team and our suppliers. Developing the propulsion and battery system, in collaboration with experienced program partners, has resulted in a world class engineering

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capability that will lead the way towards the decarbonisation of air travel. Our next step is to adapt this pioneering technology so it can be applied across the wider aerospace industry to deliver a more sustainable way to fly."

Rolls-Royce has an incredible history of flying speed record attempts and breaking records, dating back to the Schneider Trophies of the early 1930s. The speed achieved by test pilot and Rolls-Royce Director of Flight Operations Phill O'Dell in the 'Spirit of Innovation' was more than 213.04 km/h (132 mph) faster than the previous record set by the Siemens eAircraft powered Extra 330 LE Aerobatic aircraft in 2017. Never in the history of the FAI record attempts has there been such a significant increase in speed over such a short time, highlighting the rapid pace at which electrification of aerospace is advancing.

Phill O'Dell said: "Flying the 'Spirit of Innovation' at these incredible speeds and believing we have broken the world-record for all-electric flight is a momentous occasion. This is the highlight of my career and is an incredible achievement for the whole team. The opportunity to be at the forefront of another pioneering chapter of Rolls-Royce's story as we look to deliver the future of aviation is what dreams are made of."

While all three organisations share a passionate pioneering spirit, Rolls-Royce through the development process has learnt from the motorsport background of both partners and in particular the pace of start-up Electroflight. Meanwhile we have shared expertise and technology with our partners including the rigorous safety and testing methods needed by the civil aviation industry – this combination has helped turn a concept into a world record breaker.

Dr Tim Woolmer, YASA's Chief Technology Officer and Founder said, "Electric flight is set to be as transformative for mobility as the jet engine was 70 years ago. It's thrilling to see our ultra-high performance, super-low weight electric motors powering the 'Spirit of Innovation' to these great speeds, and to know that collaborative projects like ACCEL take us one step closer to emissions-free electric flight becoming a commercial reality for all."

The ACCEL programme has also been supported by two further great British pioneers, Jaguar Land Rover who have loaned all-electric zero emission Jaguar I-PACE cars as towing and support vehicles and Bremont, the luxury watchmaker, who were the official timing partner for the record attempt. The aircraft took off from the MoD's Boscombe Down site, which is managed by QinetiQ and flew profiles according to the FAI guidelines for record attempts in the Powered Aeroplane C-1C Electric class. Test Pilot, Electroflight Steve Jones flew the 'Spirit of Innovation' aircraft for the 15km and the time to climb to 3000 metres record runs that have been submitted.

Gary Elliott, CEO of the Aerospace Technology Institute, said: "The ACCEL project demonstrates that strategic investment in UK technology and innovation can achieve extraordinary world-beating results, and sets us firmly on the path to decarbonising passenger flight in the future. This achievement of Rolls-Royce, Electroflight and YASA will resonate for many years to come and inspire the next generation of aerospace engineers. They deserve their place in the record books, and the ATI is proud to have played our part in that. Congratulations to the whole team."

Rolls-Royce involvement in the ACCEL project is just one of the ways in which we are looking to make aviation more sustainable. In June, we announced our pathway to net zero carbon emissions – a year on from joining the UN Race to Zero campaign – committing to ensure our new products will be compatible with net zero operation by 2030 and all our products will be compatible with net zero by 2050.

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20 NOVEMBER 2021

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