ADVANCED LOW PRESSURE SYSTEM (ALPS) TESTING GETS UNDERWAY TO GET ROLLS-ROYCE ULTRAFAN® ONE STEP CLOSER

News / Manufacturer

25% more efficient than a first-generation Trent engine, is it possible? The answer will be Rolls-Royce UltraFan®. First tests on a donor engine.

Engineers have successfully tested a key component of the UltraFan engine design. UltraFan will redefine the world of jet engines, delivering significant weight, noise and fuel burn reductions.

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For the first time, all composite elements of the Advanced Low Pressure system (ALPS), including fan blades, a fan case and annulus fillers, were tested together on a donor engine.

The engine parts are manufactured using state-of-the-art, fully automated construction methods at Rolls-Royce's Composites Technology Facility, a Composites Centre of Excellence.

Each fan blade is made robotically, building up around 500 layers of carbon fibre materials. Heat and pressure are then applied, and each blade is finished with a leading titanium edge, which offers extreme protection against foreign objects and bird strikes. When laid out, the layers of composite material that make up the fan blades and the fan case on this engine would stretch from London to Leeds.

The Advanced Low Pressure System demonstrates Rolls-Royce's IntelligentEngine vision. Each blade has a digital twin – an identical virtual copy. During testing, vast amounts of data will be collected that will be fed into the digital twins, and allow engineers to predict how each blade will perform in service.

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Ash Owen, Rolls-Royce, Chief Engineer, Civil Aerospace Demonstrator Programmes said: “These incredible technologies are taking our world-leading fan efficiency to the next level. More than a decade of research and development has brought us to this point and I’m confident that after extreme weather testing in Canada and performance testing in Germany, we can prove ALPS technology even further here in Derby, moving us one step closer to our UltraFan demonstrator.”

The Advanced Low Pressure System programme is a partnership between Rolls-Royce, Clean Sky, Innovate UK, the Department for Business, Energy and Industrial Strategy, the Aerospace Technology Institute, ITP Aero and GKN.

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