VOLVO AERO

Press Information

COOPERATION WITH PRATT & WHITNEY IS BREAKTHROUGH FOR VOLVO AERO

Volvo Aero has been selected by Pratt & Whitney as a strategic partner in the development of the company's new rocket engine, the RL60.

This will be the largest assignment to date in the US for Volvo Aero's space operations. Concurrently, the decision also represents a breakthrough for Volvo Aero's sandwich technology.

Pratt & Whitney's Space & Missile Propulsion unit has now disclosed its plans to begin development of the next generation of liquid-oxygen and hydrogen-fueled upper stage rocket engines, the RL60. P&W has already entered the first phase of this development which will lead to a full scale demonstrator engine test at the end of 2002.

A key component in the RL60 is Volvo's new sandwich nozzle, a completely new, patented production technology, which the company began developing in 1997. Volvo Aero has previously tested a sandwich nozzle in smaller scale, but the RL60 represents the first full-scale testing.

Volvo Aero has been convinced for some time that the new nozzle technology will be applied in tomorrow's space rockets. Pratt & Whitney's decision to select Volvo Aero as a cooperation partner in the RL60 program is the first confirmation that this development was the correct approach.

"It is highly pleasing that the sandwich design has scored its breakthrough. Our expansion goals are based on our Space Propulsion Division also becoming established in the US," says Fred Bodin, President of Volvo Aero Corporation. "I hope that this is just the first step toward more extensive cooperation on the American market."

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As a result of Volvo Aero now initiating the RL60 cooperation with Pratt & Whitney with the sandwich nozzle, the company's potential is enhanced to also apply the sandwich concept within the European space industry. This nozzle technology was developed initially also considering the Ariane rocket and there is no obstacle to its use on this – as well as other space rockets.

Torgny Stenholm, Nozzles Business Manager at Volvo Aero comments: "There are many advantages with the sandwich design. Since production is based on more simple raw materials, and uses such standard processes as forming, milling and welding, the design is both cost-efficient and robust. Compared with other production methods for nozzles, the sandwich technology is a superior combination of strength, stiffness, flexibility, short lead-times and, particularly, radically reduced production cost.

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Facts about the Volvo Aero sandwich design

The patented sandwich technology involves forming a cone from 3-5 millimeter thick sheet metal and then milling out hundreds of cooling channels. An outer jacket is mounted over this cone and is welded to the underlying sheet metal using laser-welding.

The sandwich cone is then formed into its final bell-shape. Thereafter, as needed, several cones can be welded together to form a nozzle, which is often 1.5 to 3 meters in height and diameter.

The thin metal must withstand enormous stresses: liquid hydrogen flows through the channels (-230 oC) to cool the nozzle walls from the heat of the combustion chamber flame at 3,300 oC. The outer surface of the nozzle holds a temperature of minus 170 oC, while the inside wall is heated to plus 600 oC.

Facts about the RL60

The RL60, with a thrust of 50,000 –60,000 pounds (about 30 tons), will be the most high-performance cryogenic upper-stage engine in the world.

Pratt & Whitney's current upper-stage engine, the RL10, is the most used cryogenic engine in the western world. It is used on many well-known rockets: Atlas, Titan and Delta. Compared with the RL10, the new engine will have twice the thrust.The first phase of the RL60 development program involves

manufacturing and initial tests during 2001, which will lead to full-scale demonstration engine testing at the end of 2002.

Following a successful demonstrator engine program, the RL60 can then enter full scale development and could be ready for commercial service by the end of 2005.

The Volvo Group is one of the world's leading manufacturers of trucks, buses and construction equipment, drive systems for marine and industrial applications and aircraft engine components. The Group also provides complete solution for financing and service. The Group has about 78,000 employees, production in 25 countries and operations are carried out in more 185 markets. Annual sales of the Volvo Group amount to nearly SEK 200 billion.

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