Lift Fan Installed In X-35B Following Successful Tests Of Lockheed Martin's JSF STOVL Propulsion System

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The Lockheed Martin Joint Strike Fighter (JSF) team successfully installed the shaft-driven lift fan in the JSF X-35B in less than three hours, as the short-takeoff/vertical-landing (STOVL) aircraft prepares for hover-pit testing next month.

"The installation was a spectacular success. The lift fan went in very easily," said Scott Winship, STOVL product manager for the team. "A laser- alignment check verified that the fit is essentially perfect."

The lift fan installation includes the fan, a vectored nozzle, clutch and all actuation and service systems in an integrated unit. Hover-pit testing of the X-35B will begin next month at Lockheed Martin's Palmdale, Calif., facility.

"Our propulsion team has recently run the fan for hours and hours on end, at very high power settings, without incident," said Tom Burbage, executive vice president and general manager of the Lockheed Martin JSF program. "The lift-fan concept has always held clear advantages for an aircraft of the JSF's dimensions. Now we're showing that the hardware itself is ready and reliable."

The unique lift-fan propulsion system -- a patented Lockheed Martin design -- differs from traditional direct-lift systems, such as those used in the Harrier. Where direct-lift systems channel hot engine gases to achieve vertical flight, the Lockheed Martin system uses a counter-rotating lift-fan - - located behind the cockpit and connected to the engine via a drive shaft -- as a primary lifting force. The fan produces more than 18,000 pounds of cool thrust in hover flight, with an additional 18,000 pounds coming from the main engine's vectored aft nozzle and wing roll-posts. Because the lift fan amplifies engine power, vertical lift is achieved at lower power settings, reducing rear exhaust temperatures and velocities and significantly improving the ground environment.

Rick Rezabek, X-35 product manager, said the fan's precise fit required no adjustments after the installation, a remarkable achievement considering the airframe had undergone rigorous flight testing (as the X-35A) and sustained high-g loads from Oct. 24 to Nov. 22, 2000.

"We were confident that our design, tooling and assembly work would validate our approach, and the actual installation has done that in spades," Rezabek said. "When you consider that this aircraft has been flown for a month in an aggressive flight test program, it is even more impressive."

The X-35B is designed to meet U.S. Marine Corps/Royal Navy-Royal Air Force specifications. The X-35A Air Force variant was renamed the X-35B as installation of the STOVL propulsion system began. In the Lockheed Martin JSF design, the Air Force and Marine Corps/Royal Navy-Royal Air Force variant share the same outer mold lines.

Lockheed Martin, in partnership with Northrop Grumman and BAE SYSTEMS, is in competition to build the JSF for the United States and United Kingdom. Government selection of a single contractor for the Engineering and Manufacturing Development phase is set for 2001.

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