Boeing Starts Production of Aft Fuselage for 100th F-22 Raptor

The Boeing Company [NYSE: BA] this week began manufacturing the aft fuselage section for the U.S. Air Force's 100th F-22 Raptor air dominance fighter at the company's Developmental Center in Seattle.

"I'm proud of this team's perseverance in applying Lean Enterprise principles to the Raptor manufacturing process," said Paul Bay, Boeing vice president and F-22 program manager. "Since delivery of the first aft fuselage in October 1996, we've continually improved our cost, quality and delivery performance, reducing man-hours per unit by 89 percent and cutting overall flow time in half."

Boeing manufacturing engineers streamlined production in late 2003 when they replaced the facility's massive stationary assembly jigs with much smaller, more flexible tooling on wheels. For this and other industrial design breakthroughs, Boeing's F-22 assembly center has become a model of manufacturing excellence.

Boeing and its suppliers also use electron-beam welding to fuse the titanium fuselage components to precise tolerances. This approach reduces the need for traditional fasteners by 75 percent, lowering the airplane's weight, simplifying assembly and minimizing the chance of fuel leaks.

Where fasteners could not be eliminated, Boeing engineers pioneered a system that uses an automated, laser-guided machine to drill fastener holes. The laser tracker has a targeting feature and automated data feedback software that guide the drill to the precise location before drilling. Operated by machinists, the system drills nearly 2,500 holes in the structure. Engineering data fed into a computer controls the holes' location, diameter and depth. The holes are used for fastening the upper composite skin and lower engine-bay doors to the structure.

The 5,000-pound aft fuselage, measuring about 19 feet long and 12 feet wide, houses the Raptor's twin Pratt & Whitney-built F119 engines. It supports the wings and tail, carries fuel and contains the environmental control system and fuel, electrical, hydraulic and engine subsystems. The section also is instrumented with sensors that continuously monitor 430 functions during flight.

The aft fuselage is scheduled for delivery in October to teammate and prime contractor Lockheed Martin [NYSE: LMT], which recently delivered the 76th F-22 to the Air Force, with 31 additional Raptors currently on contract. The fighter is assigned to four U. S. bases: Testing is conducted at Edwards Air Force Base (AFB), Calif.; tactics development takes place at Nellis AFB, Nev.; pilots and maintenance teams receive training at Tyndall AFB, Fla.; and operational F-22s of the 1st Fighter Wing are assigned to Langley AFB, Va.

The F-22 Raptor, the world's most advanced fifth-generation fighter, is built by Lockheed Martin in partnership with Boeing and Pratt & Whitney. Parts and subsystems are provided by approximately 1,000 suppliers in 42 states. F-22 production takes place at Lockheed Martin Aeronautics facilities in Palmdale, Calif.; Meridian, Miss.; Marietta, Ga.; and Fort Worth, Texas, as well as Boeing's Seattle plant. Final assembly and initial flight-testing of the Raptor occur at the Marietta facilities.
Headquartered in Bethesda, Md., Lockheed Martin employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2005 sales of $37.2 billion.
A unit of The Boeing Company, Boeing Integrated Defense Systems is one of the world's largest space and defense businesses. Headquartered in St. Louis, Boeing Integrated Defense Systems is a $30.8 billion business. It provides network-centric system solutions to its global military, government and commercial customers. It is a leading provider of intelligence, surveillance and reconnaissance systems; the world's largest military aircraft manufacturer; the world's largest satellite manufacturer; a foremost developer of advanced concepts and technologies; a leading provider of space-based communications; the primary systems integrator for U.S. missile defense; NASA's largest contractor; and a global leader in sustainment solutions and launch services.
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