

DOD Weapons Tester Cites Progress On F-35 Ejection Seat

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F-35: Lockheed Martin

In a 62-page report that focuses primarily on delays and challenges for the F-35 program, one of the Joint Strike Fighter's toughest critics highlighted progress toward fixing a safety issue with the aircraft's ejection seat.

At issue is a problem with the design of the F-35's escape system that poses a significant risk of neck damage or death during ejection of pilots in the lowest weight range. For middleweight pilots just above that 103-136 lb. range, the U.S. Air Force has also acknowledged an "elevated" level of risk. The problem, discovered in 2015, led the U.S. military services to bar pilots under 136 lb. from flying the F-35.

But the Joint Program Office (JPO) is making progress toward fixing the issue, including completing qualification testing of an upgraded ejection seat designed to reduce the risk to pilots weighing less than 136 lb., according to the Pentagon's top weapons tester. Martin-Baker, which manufactures the US16E seat, last year came up with a three-part solution to protect a lightweight pilot's head and neck during ejection: a lighter helmet to ease strain on the neck during the first phase of an ejection; a lightweight switch on the seat to delay deployment of the main parachute; and a fabric panel sewn between the parachute risers that will protect the pilot's head from moving backward during the parachute opening, called a "head support panel" or HSP.

Data from the qualification tests, which wrapped up in September, showed that the HSP significantly reduced neck loads during the ejection sequence, and that the switch successfully reduced opening shock from the main parachute for lightweight pilots, the Director of Operational Test and Evaluation (DOT&E) assessed in its most recent annual report.

But despite "improved results," the U.S. services have yet to determine the extent to which the risk to lightweight pilots has been improved by the three-part fix. The weight restriction

likely won't be lifted until all F-35s have the upgraded seat and all pilots have the "Gen III Lite" helmet, DOT&E concluded.

The program office plans to start retrofitting fielded F-35s with the modifications to the seats in February, and delivering aircraft with the upgraded seat in Lot 10, starting in January 2018, DOT&E says. The lighter helmet will be delivered starting in November 2017. If the timeline holds, the Air Force may open F-35 training to pilots weighing less than 136 lb. as early as December 2017, DOT&E wrote.

DOT&E highlighted one additional problem with the escape system. During certain conditions, pilots may be injured by the Transparency Removal System, which shatters the canopy before an ejection, allowing the seat and pilot to leave the aircraft. The program office has yet to complete the additional testing and analysis needed to determine the risk posed by the system during off-nominal ejections, DOT&E wrote.