Military Engines

# F135 Engine

## Proven Power for the F-35 Lightning II — In Flight, In Production

### Providing Fifth-Generation Power

Pratt & Whitney's F135 engine powers the F-35 Lightning II, the single-engine strike fighter developed by Lockheed Martin in conjunction with Northrop Grumman and BAE Systems. The F-35 includes three variants – the F-35A (Conventional Takeoff and Landing), F-35B (Short Takeoff and Vertical Landing) and F-35C (Carrier Variant).

### Derived from Proven Technology

The F135 has evolved from the proven F119-PW-100 engine, the technologically advanced turbofan engine that exclusively powers the U.S. Air Force's F-22 Raptor. In service since 2003, the F119 engine has the distinction of being the safest fighter engine introduced in U.S. Air Force history. The F135 offers the same operational pedigree with proven stealth capabilities, along with features such as advanced prognostics and health-management systems.

### International Participation

The F-35 is the first truly international fighter aircraft development program – developed to serve the United States, the United Kingdom, Italy, the Netherlands, Turkey, Canada, Australia, Denmark, Norway and other allied nations. To support its customers, Pratt & Whitney has partnered with the best aerospace companies in the world including Rolls Royce and UTC Aerospace Systems to manufacture critical components of the F135, with the goal of producing the most advanced propulsion system the world has ever seen.

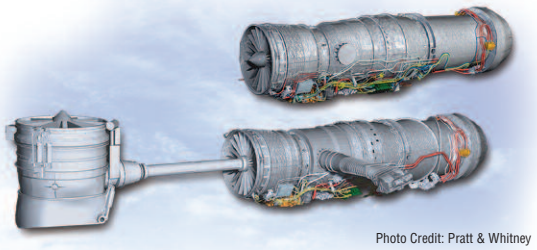

Photo Credit: Pratt & Whitney

### Reliability

Since powering the F-35's first flight in December 2006, the F135 has maintained high readiness levels that have enabled the program to meet flight test objectives for all three aircraft variants. Supportability features are designed to offer ease of maintenance while achieving unprecedented engine reliability and maintainability. Networked maintenance and logistics support capabilities are projected to significantly lower maintenance costs and increase mission availability. Likewise, common sustainment solutions across the services and partner nations offer economies of scale targeted to lower long-term costs relative to current engine fleets.

### Affordability

The F135 program plans to continue to drive down cost as it ramps up production. The F135 produces 20% more thrust and weighs 1,500 pounds more than the F119. The F135 program objective is to achieve comparable production costs as the F119.

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## Product Facts

**Engine Characteristics**

| | | | |
|---|---|---|---|
| Maximum thrust class (CTOL/CV) | 43,000 pounds (191.3 kN) | Maximum thrust class (STOVL) | 41,000 pounds (182.4 kN) |
| Intermediate thrust class (CTOL/CV) | 28,000 pounds (128.1 kN) | Intermediate thrust class (STOVL) | 27,000 pounds (120.1 kN) |
| Length | 220 inches (5.59 m) | Short takeoff thrust class (STOVL) | 40,740 pounds (181.2 kN) |
| Inlet diameter | 43 inches (1.09 m) | Hover thrust class | 40,650 pounds (180.8 kN) |
| Maximum diameter | 46 inches (1.17 m) | Length | 369 inches (9.37 m) |

**F135 Program Milestones**

| | |
|---|---|
| October 2003 | F135-PW-100 first engine to test |
| April 2004 | F135-PW-600 first engine to test |
| December 2006 | F-35A first flight |
| June 2008 | F-35B first flight |
| February 2010 | F-35A, F-35C initial service release qualification |
| March 2010 | F-35B first vertical landing |
| June 2010 | F-35C first flight |
| December 2010 | F-35B initial service release qualification |
| October 2011 | F-35B first shipboard landing |
| March 2012 | F-35A first training flight at Eglin Air Force Base |
| March 2013 | F-35B first operational vertical landing at Marine Corps Air Station Yuma |
| August 2013 | F-35B first nighttime shipboard operations |
| November 2014 | F-35C Navy aircraft testing on board U.S.S. Nimitz |
| July 2015 | F-35B U.S.M.C. declares Initial Operational Capability (IOC) |

**Military Applications**

F-35 Lightning II A, B, C



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