Military Engines

F119-PW-100 Turbofan Engine

Proven Power for the F-22 Raptor

Pratt & Whitney's F119 turbofan engine is the world's first fifth-generation fighter engine. The F119 combines stealth technologies and vectored thrust performance to provide unprecedented maneuverability and survivability with a high thrust-to-weight ratio. The ability to operate supersonically without afterburner—supercruise—gives the F-22 exceptional combat performance without compromising mission range.

The F119 is equipped with a number of advanced technologies for unmatched operational performance and reliability. Its three-stage integrally bladed fan is powered by a single-stage low-pressure turbine. The robust, yet compact, high-pressure compressor features advanced airfoil aerodynamics and integrally bladed rotor disks for ensured durability. The engine's counter-rotating core has an aerodynamically efficient six-stage compressor driven by a single-stage high-pressure turbine featuring single-crystal superalloy blades and advanced cooling technologies. The engine delivers unparalleled aircraft maneuverability with its unique two-dimensional pitch-vectoring exhaust nozzle.

The F119 engine has achieved a best-in-class safety record since its introduction by outperforming legacy engine benchmarks. Ease of assembly, maintenance and repair were designed into the F119 from its inception using a balanced team approach that included assemblers and flight line mechanics. Requirements for support equipment and labor were significantly reduced, minimizing the overall F119 logistics footprint.

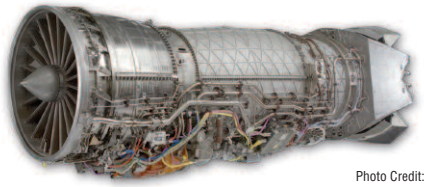

Photo Credit: Pratt & Whitney

Product Facts

Program Milestones

April 1991	F119 selected to power the F-22 Raptor
December 1992	First F119 begins ground testing
September 1997	F-22 makes its first flight
December 2000	First production F119 engine delivered
July 2002	F-22 achieves Initial Service Release
January 2003	First U.S. Air Force F-22 base activated
April 2005	U. S. Department of Defense approves F-22 full-rate production
December 2005	F-22 achieves Initial Operational Capability
December 2007	F-22 achieves Full Operational Capability
December 2012	Final F119 engine delivered
March 2013	First depot overhaul completed
September 2014	First combat mission
August 2015	400,000 operational F119 flight hours

F119 Characteristics

Type	Twin-spool, augmented turbofan
Thrust	35,000-pound thrust class
Engine control	FADEC (Full-Authority Digital Engine Control)
Compression system	Dual-rotor, counter-rotating, axial flow, low aspect ratio - Three-stage fan - Six-stage high-pressure compressor
Combustor	Annular, Floatwall™ configuration
Turbines	Axial flow, counter-rotating - One-stage high-pressure turbine - One-stage low-pressure turbine
Nozzle	Two-dimensional pitch-vectoring convergent/divergent

F119 Applications

F-22 Raptor Air Superiority Fighter

Proven reliability and safety for F135/F-35 derivative application

Pratt & Whitney
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