

BE-4 Rocket Engine

Commercially Developed | Made in USA

Blue Origin

American Boost Propulsion System

The BE-4 is an American-made liquid rocket engine currently under development by Blue Origin for orbital launch vehicle boost applications. The BE-4 uses liquid oxygen (LOx) and liquefied natural gas (LNG) – a commercially available form of methane – to produce 550,000-lbf thrust at sea level.

Fully Funded Commercial Partnership

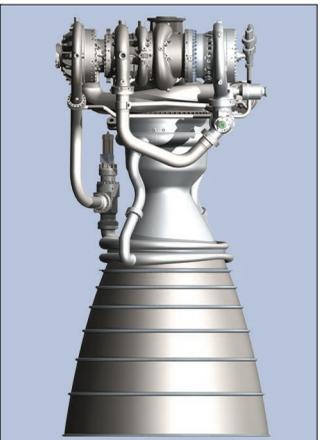
The BE-4 is a commercial development funded by private industry. United Launch Alliance (ULA) has partnered with Blue Origin to develop the BE-4 and ensure its applicability to ULA's next generation launch vehicles, meeting both commercial requirements and those of the U.S. Air Force's Evolved Expendable Launch Vehicle (EELV) program. The BE-4 engine is designed for low recurring cost, using state-of-the-art design and manufacturing techniques.

Facilities Built & Testing Underway

To support development of the BE-4, Blue Origin has built a dedicated LNG testing facility near Van Horn, Texas, enabling a rapid test pace. Commissioned in May 2014, the LNG facility can test thrust levels greater than one million pounds-force.

Engine component testing is underway at Blue Origin test facilities in Kent, Washington, and Texas. Testing to date includes subscale oxygen-rich preburner development and staged combustion testing of the preburner and main injector assembly. The next major development milestone will be testing of the turbopumps and main valves. Full engine testing is scheduled to begin in 2016.

BE-4 Characteristics	
Fuel	Liquefied Natural Gas (LNG)
Oxidizer	Liquid Oxygen (LOx)
Cycle	Oxygen-Rich Staged Combustion (ORSC)
Flight	Engine ready for flight in 2017



LNG Enhances Affordability, Reuse

Unlike other rocket propellants, such as kerosene, LNG enables autogenous tank pressurization, eliminating the need for costly and complex pressurization systems, such as helium, which is in increasingly scarce supply. The low-cost availability of LNG enables an extended engine development test program. Further, the gaseous properties of LNG simplify decontamination of the engine prior to vehicle installation, while improving operability and safe operation for reuse.

Builds on BE-3 Flight Heritage

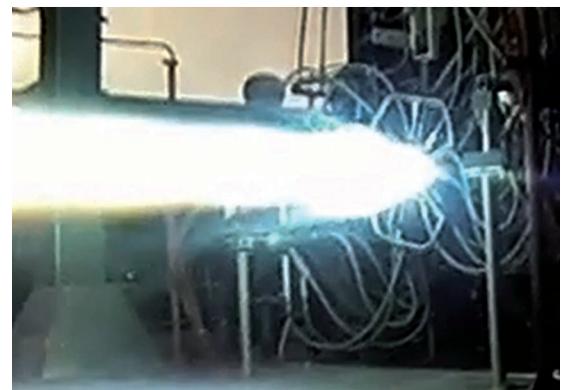
Blue Origin also recently completed development testing of the BE-3 hydrogen-fueled engine which produces 110,000-lbf thrust at sea level. The BE-3 is the first completely new liquid hydrogen-fueled engine to be designed for production in the U.S. since the RS-68 more than a decade ago. Its high-performance, low-cost and reusability is well suited for boost, upper-stage and in-space applications on both government and commercial launch systems.



Blue Origin's BE-4 Engine Test Facility in West, TX



BE-4 LOx impeller and turbine



BE-4 staged combustion testing



Blue Origin

Blue Origin, LLC was established by Amazon.com CEO and founder Jeff Bezos with a bold vision of greatly increasing the number of people that fly into space so that we humans can better continue exploring the solar system. Blue Origin is focused on developing vehicles and technologies to dramatically lower the cost and increase the safety of human spaceflight.

For more information and a list of job openings, please visit us at www.blueorigin.com

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