

FACT SHEET: STRATOLAUNCH LIQUID ROCKET ENGINE “The PGA Engine”

STRATOLAUNCH VISION

Founded in 2011 by Paul G. Allen, Stratolaunch Systems Corporation believes in safeguarding Planet Earth for future generations. We do this by enabling convenient, affordable, routine, airline-style access to space that empowers the world’s problem solvers, so that they can collect rich and actionable data and drive advancements in science, research, and technology from space.

THE PGA ENGINE

Stratolaunch is working to develop a high performing liquid rocket engine capable of launching vehicles into space. With a **100 percent in-house design**, the engine will support multiple configurations of Stratolaunch’s future in-house launch vehicles to provide customers a more affordable price-to-orbit for payload. The engine will improve technology development for the space industry, potentially enabling a more rapid cadence than current state-of-the-art tech.

The propulsion team is currently in the **process of manufacturing and testing prototype subscale and full scale hardware**. The team has completed ignitor development, with injector testing currently underway. After this is completed, the team will perform a full-scale preburner test by the end of 2018. The preburner is currently at the test facility at the NASA Stennis Space Center.



TECHNICAL ASPECTS

Hydrogen/Oxygen Engine with Fuel Rich Staged Combustion: Once completed, Stratolaunch’s liquid rocket engine will produce **200,000 lbf of thrust**. The hydrogen/oxygen engine will have the highest specific impulse of any rocket engine propellant. The only by-product of this combustion will be water and the engine will be ideal for both air-launch and in-space propulsion applications. Compared to other fuels, the hydrogen/oxygen engine will enable more payload-to-orbit and will offer more reusability.

Additive Manufacturing: The Stratolaunch propulsion team has prioritized the use of additive manufacturing for the development of its liquid rocket engine. At the moment, **85 percent of**

manufacturing has an additive component. Additive manufacturing leads to rapid prototyping on a scale faster than traditional methods—allowing for new designs that are not possible with traditional manufacturing methods

LAUNCH VEHICLES

Stratolaunch’s unique air-launch system will use the world’s largest aircraft as a mobile launch platform, capable of deploying launch vehicles that will carry satellites to multiple orbits and inclinations on a single mission. With these new vehicles, Stratolaunch is poised to make access to space convenient, affordable, and routine.

- **Pegasus:** With its existing track record of over 35 successful launches, Pegasus provides dependable access to orbit.
 - Capability: 370 kg payload* for a single or triple configuration
 - Status: Flight proven, integration and testing ongoing with first flight in 2020
- **Medium Launch Vehicle (MLV):** A new medium-class air-launch vehicle optimized for short satellite integration timelines, affordable launch and flexible launch profiles.
 - Capability: 3,400 kg payload*
 - Status: In development with first flight in 2022
- **Medium Launch Vehicle – Heavy:** A three-core MLV variant with capability to deploy heavier payloads to orbit.
 - Capability: 6,000 kg payload*
 - Status: Early development
- **Space Plane:** A fully reusable space plane that enables advanced in-orbit capabilities and cargo return. Initial designs optimized for cargo launch, with a follow-on variant capable of transporting crew.
 - Capability: Medium-class payload or crew
 - Status: Design study