



## LAUNCH AND PROPULSION

Northrop Grumman is a leader in launch services and propulsion systems. We leverage more than 60 years of launch vehicle development and production experience delivering innovative, competitive, and highly reliable solutions to government and commercial customers.

### LAUNCH SYSTEMS

Northrop Grumman has created and flown over 65 different launch vehicle configurations, and on average we design two launch vehicles per year.

We are a leader in launch site development and launch from more domestic and international locations than any other launch provider.

We are a trusted system integrator known for advancing space launch capabilities.

### LAUNCH VEHICLES

- The Antares™ launch vehicle provides responsive and low-cost access to space. Today the rocket is primarily used to support the company's Commercial Resupply Services contract with NASA. Upgrades to Antares are underway and will result in increased performance and a domestic supply chain.
- The Minotaur rocket family provides low-cost and reliable access to space for government-sponsored payloads. Minotaur has completed missions out of every major U.S. spaceport, demonstrating the vehicle's unique versatility and reliability.
- The Pegasus® rocket revolutionized the industry as the world's first commercially developed space launch vehicle.
- Pegasus is used to deploy small satellites into low-earth orbit in a little over 10 minutes.
- The L-1011 Stargazer aircraft is not only a reusable first stage for the Pegasus rocket, but serves as a platform for hypersonic testing.
- Northrop Grumman and Firefly Aerospace are co-developing a new medium launch vehicle (MLV) that combines the best flight-proven technologies, systems, and mission experience from both companies to fill a void in the underserved medium-lift market. Carrying more than 16,000 kg to low Earth orbit, MLV will serve commercial, civil, national security, and international launch markets with competitive pricing to customers' preferred orbits. MLV will first launch from Virginia's Mid-Atlantic Regional Spaceport (MARS) at Wallops Island, and is designed to be compatible with additional launch ranges on the east and west coast.

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## PROPULSION SYSTEMS

Northrop Grumman is an expert and leading provider of solid propulsion systems, leveraging six decades of flight-proven technologies to deliver products that support national defense strategic weapon systems, civil space human spaceflight and scientific exploration missions, and commercial launch service providers.

- We produce the twin solid rocket boosters for NASA's Space Launch System rocket that provides new capabilities for human deep space exploration. We also provide two critical components of the Orion spacecraft's Launch Abort System – the abort motor and attitude control motor – designed to lift the crew to safety if an emergency were to arise on the pad or during ascent.
- Northrop Grumman is a leading provider of commercial solid rocket motors built on flight-proven heritage designs. These designs are continuously improved to leverage commonalities and enhance performance, expanding our motor families to meet new launch vehicle and payload demands at low cost, high reliability and for repeatable performance.
- Northrop Grumman solid propulsion is an essential asset for national security, providing stages for U.S. ground-based defense and strategic deterrent weapons systems, interceptors, submarine-launched systems and new tactical missile systems.
- The Trident II (D5) program provides propulsion for the U.S. Navy's strategic weapon program in the fleet ballistic missile system and will remain in service into the 2080s.
- We have been a trusted partner for national defense since Minuteman production began in the 1960s. Today we provide propulsion systems for the nation's LGM-35A Sentinel missiles, Ground-based Midcourse Defense interceptor, new hypersonic systems and various missile defense target vehicles.
- For the first time ever, Northrop Grumman is developing nine new large solid rocket motors for five programs concurrently. To accommodate a significant increase in new and existing motor programs by 2030, we are constructing 11 new buildings and modifying 16 buildings at the company's Utah facilities. These efforts will optimize operations in a way that supports an increase in capability, scalability, capacity and enhances overall production and performance.

## FOR MORE INFORMATION

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