



THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

Propulsion Systems

*Propulsion for space exploration,
commercial launch and strategic
and missile defense*

Northrop Grumman provides a wide range of reliable solid rocket motors for the company's own vehicles and for most other space launch providers in government and commercial markets. For defense programs, the company produces propulsion systems for the Trident II (D5) and Minuteman III strategic missiles and the company's Ground-based Midcourse Defense interceptor and various missile defense target vehicles.

Northrop Grumman is also building the five-segment boosters for NASA's heavy lift Space Launch System (SLS) and the main launch abort motor and attitude control motor for the Orion crew capsule. Northrop Grumman propulsion systems are employed in the company's Pegasus®, Minotaur, Antares™ and Omega™ rockets as well as in United Launch Alliance's Delta IV and Vulcan launch vehicles.

Facts At A Glance

World's largest producer of solid rocket motors for commercial, military and scientific missions

Supplier of critical capabilities for national strategic and missile defense applications

Developer of largest solid rocket motors in the world (monolithic and segmented)

Provider of systems engineering and integration for comprehensive launch services at multiple sites

Industry leader in the development of advanced flares and decoys

Developer of advanced warhead technologies

Commercial Programs

Northrop Grumman supplies a number of affordable rocket motors for commercial launch applications. Graphite Epoxy Motors (GEM) are the strap-on boosters that provide the thrust for Delta IV medium, OmegA and Vulcan launch vehicles. Orion motors power multiple stages of the company's Minotaur and Pegasus launch vehicles, as well as Ground-based Midcourse Defense and target vehicles. CASTOR[®] motors provide the thrust for Northrop Grumman's own Minotaur C, Antares and OmegA launch vehicles.

Human Exploration Programs

Northrop Grumman manufactures the solid rocket boosters for NASA's Space Launch System (SLS). The SLS provides new capability for human exploration beyond low-Earth orbit. Additionally, Northrop Grumman provides two important components of the Orion crew capsule's Launch Abort System: the launch abort motor designed to carry the crew to safety if an emergency were to arise at the launch pad, and the attitude control motor that steers the capsule and orients it for parachute deployment.

Strategic Programs

Northrop Grumman's strategic programs include the Trident II (D5) production program for the U.S. Navy. The D5 is the strategic weapon program in the fleet ballistic missile system and will remain in service throughout the service life of the U.S. Ohio and U.S. Columbia submarines, and UK Vanguard and successor submarines into the 2080s. In addition, Northrop Grumman supports the U.S. Air Force with several intercontinental ballistic missile (ICBM) related solid rocket motor programs and advanced technology programs for launch vehicles and systems.

Specialty Programs

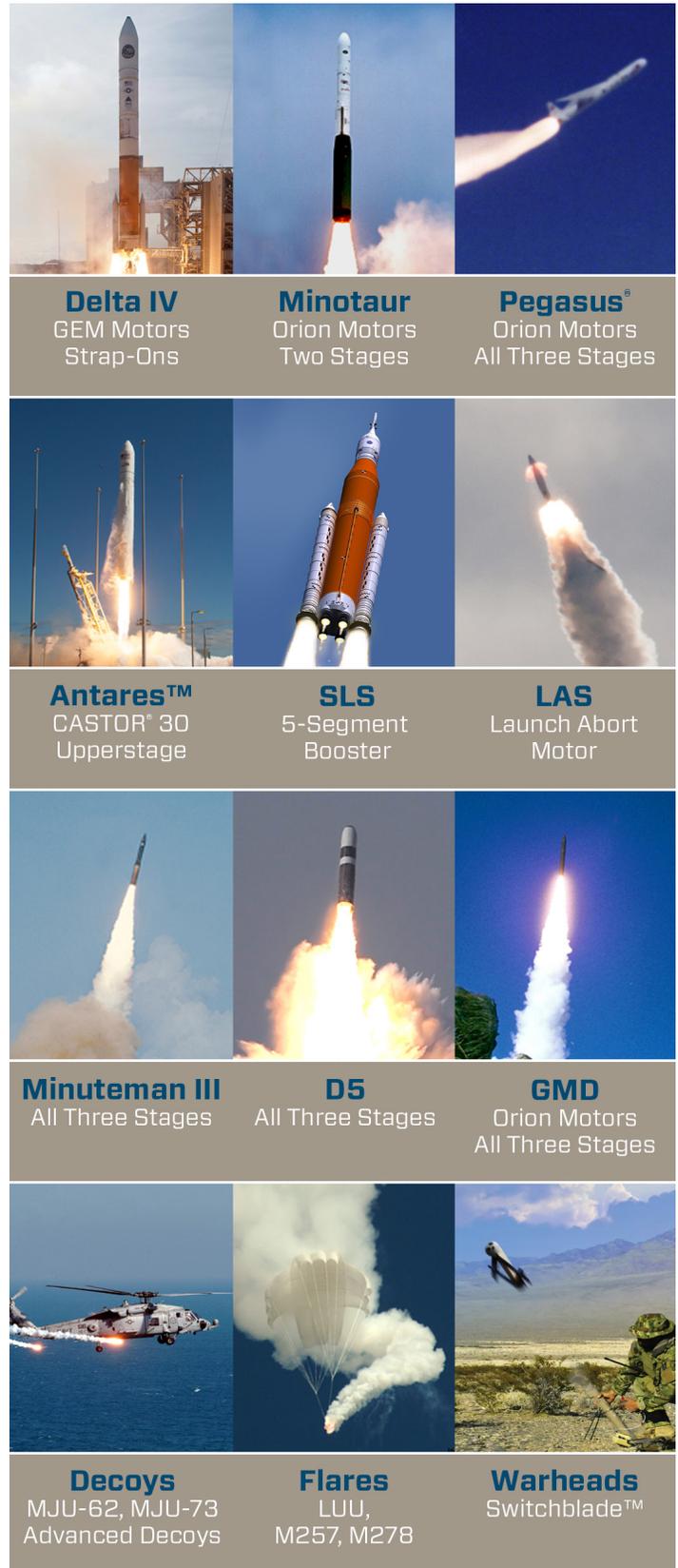
Northrop Grumman is an industry leader in developing and producing illuminating flares for visible and covert applications. Northrop Grumman manufactures two families of illuminating flares: 5 in. aircraft-deployed flares and 2.75 in. rocket-launched flares. In addition, Northrop Grumman's advanced technology infrared (IR) guided missile countermeasures are pyrotechnic decoys that are appropriate in all situations where protection against advanced IR missile threats is needed. Northrop Grumman manufactures several different types of countermeasures like dual color, spectrally matched and multi-spectral.

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