

Orion Launch Abort System Attitude Control Motor



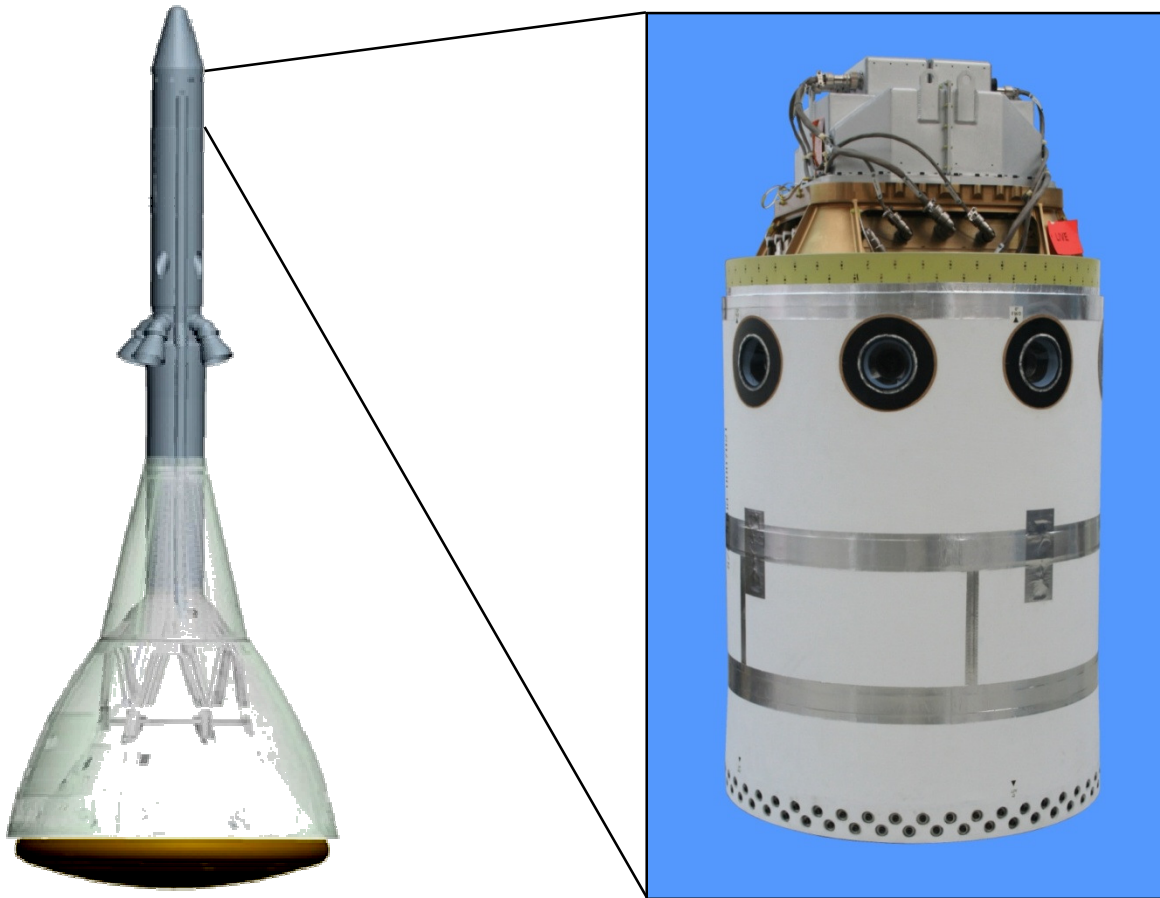
ATK is providing the attitude control motor for NASA's Orion crew exploration vehicle which is being developed by Lockheed Martin. The motor has two critical functions. It first steers Orion's launch abort system and crew module away from the Ares launch vehicle in the event of an emergency. Once cleared from hazards, the ACM then orients the capsule for parachute deployment.

ATK's attitude control motor consists of a solid propellant gas generator, with eight proportional valves equally spaced around the circumference of the motor. In combination, the valves exert up to 7,000 pounds of steering force to the vehicle in any direction. The ACM's valve control system is fully redundant.

Due to the complexity of the ACM, ATK has achieved 'industry first' milestones that include:

- First system level demonstration of a controllable solid propulsion system intended for human space flight
- First system-level demonstration of high-thrust proportional valves
- First use of a high-voltage lithium-ion battery in a solid-propellant control system
- First use of 4D C-C/SiC in a full-up system demonstration

Orion Launch Abort System ACM



Features

- 8 high-thrust proportional valves utilizing unique valve materials produced by FMI
- Single fault tolerant controller developed with Moog, Moog electro-mechanical actuators and a Quallion lithium-ion battery
- Reliable solid-fueled gas generator based on a heritage propellant
- Software and firmware developed in a CMMI Level 3 environment

Technical Data

Motor Weight: 1650 lbs

Length: 62 in.

Diameter: 32 in.

Case Material: D6AC Steel

Internal Case Insulation Material: Aramid-filled EPDM Material

Propellant: CTPB Composite

NASA approved for public release
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