

# RL10 UPPER STAGE PROPULSION FOR VULCAN

Two L3Harris RL10 engines provide upper stage propulsion for ULA's Vulcan rocket. Vulcan's upper stage, known as Centaur, offers more than twice the thrust of the Centaur upper stage that supports ULA's Atlas V launch vehicle.



RL10E-1

## RL10 ENGINE

The Nation's premier high-performance upper stage rocket engine for more than 60 years.

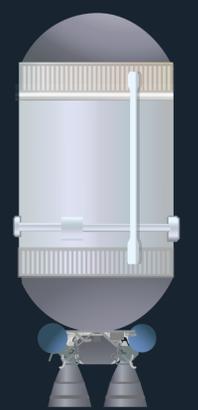
> 500 engines flown in space

Sent spacecraft to explore every planet in the solar system

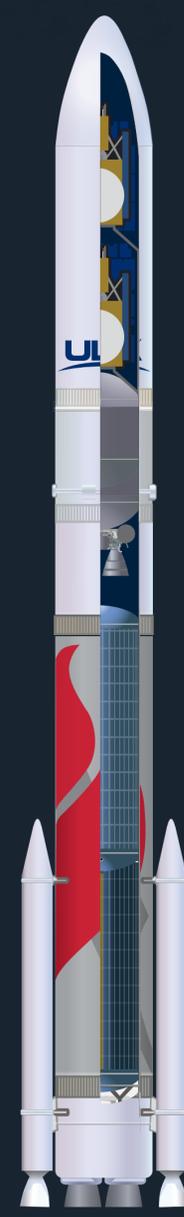
Powers three active launch vehicles: Atlas V, SLS and Vulcan

Propelled the first human-made object, the *Voyager 1* spacecraft, on its way to interstellar space

Thanks to its use of high-performance liquid hydrogen and liquid oxygen propellants, and its ability to restart multiple times in space, the efficient and reliable RL10 provides the thrust needed to accurately place payloads into the most demanding orbits.



CENTAUR UPPER STAGE



VULCAN ROCKET

## Vulcan Delivers

Vulcan is a next-generation, high-performance rocket specifically designed and certified to meet the rigorous demands of a wide range of U.S. national security space missions. The RL10 engines powering Vulcan's upper stage use the latest 3D printing technology and other advanced manufacturing techniques to reduce costs while maintaining exceptional performance and reliability.

### L3HARRIS' ROLE:

Two RL10 engines produce nearly 48,000 pounds of combined thrust

Twelve MR-107 reaction control system thrusters steer the upper stage

Avionics, including flight computers, controllers, flight termination systems and the telemetry system

Three high-pressure helium tanks support operation of the launch vehicle

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