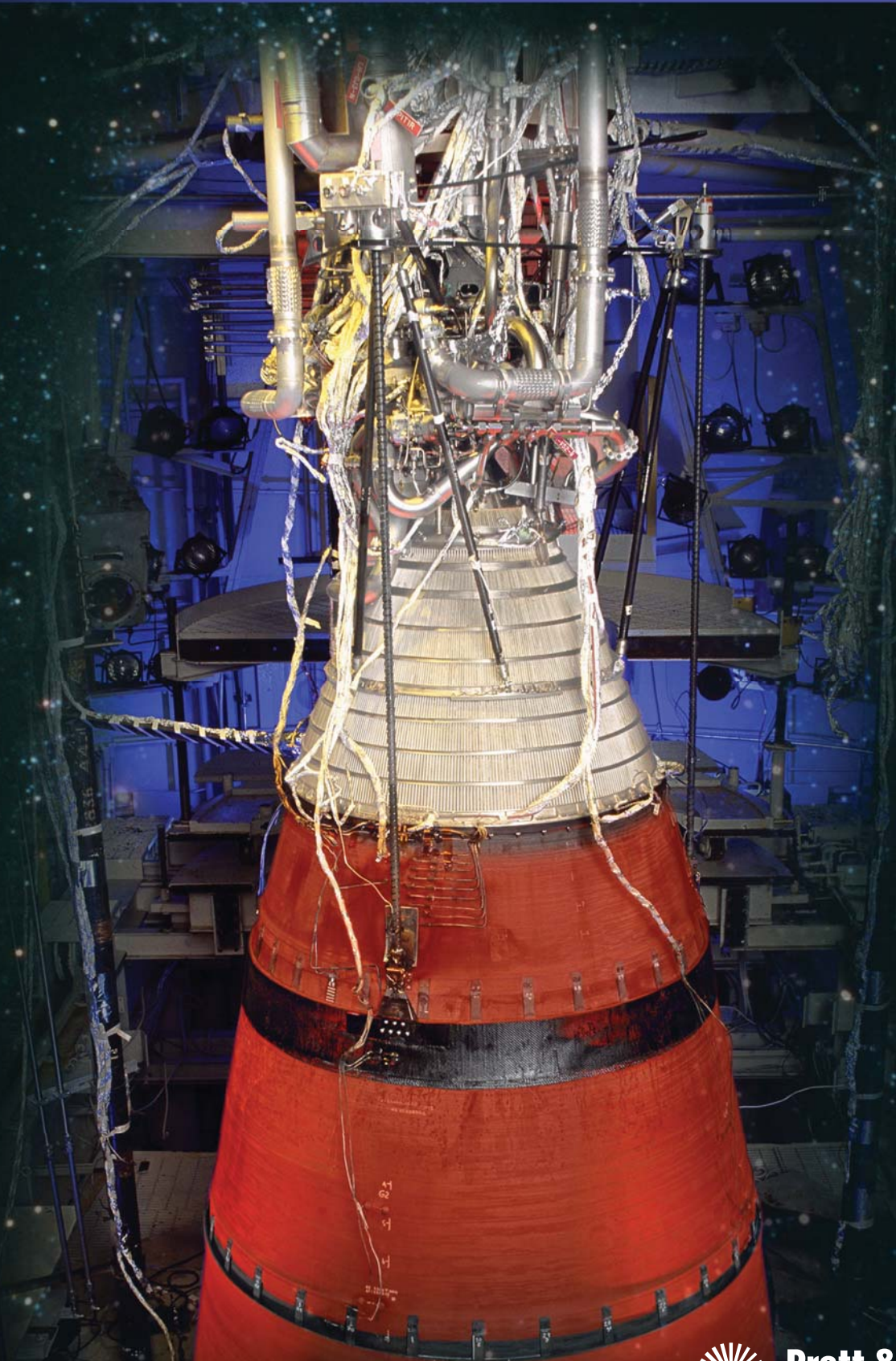


RL10B-2



Pratt & Whitney Rocketdyne



Pratt & Whitney
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RL10B-2 Propulsion System



Pratt & Whitney Rocketdyne's (PWR's) RL10 rocket engine has proven itself, over nearly one-half century of successful operational service, as one of the most reliable, safe and high-performing upper-stage rocket engines in the world. Conceived in 1959 from the company's breakthrough in the harnessing of high-energy liquid hydrogen as fuel for aerospace propulsion, the RL10 went on to amass an impressive list of accomplishments, one of the most remarkable in the history of space propulsion.

The RL10 helped place numerous military, government and commercial satellites into orbit, in addition to powering space probe missions to nearly every planet in our solar system. Some of its notable interplanetary missions include the Helios A and B solar probes, Surveyor lunar landers, Viking Mars landers and Voyager flights that performed fly-bys of Jupiter, Saturn, Uranus and Neptune, and the Cassini Saturn Orbit. The RL10 has also supported the missions of MILSTAR, EUTELSAT, TDRS, ECHOSTAR, INTELSAT, GALAXY, DSCSIII and JCSAT satellites.

Today, the RL10B-2 continues its legacy as the "workhorse" of the launch industry by currently powering the upper stage of the United Launch Alliance Delta IV launch vehicle. The RL10B-2 features the world's largest carbon-carbon extendible nozzle. This high-expansion ratio nozzle enables the RL10B-2 to achieve a remarkable 465.5 seconds of specific impulse. The RL10B-2 powers both Medium and Heavy variants of the Delta IV launch vehicle family.

Derived from the very core of the legendary RL10 that built a reputation as NASA's most reliable upper-stage engine, the RL10B-2 is an unparalleled propulsion system evolved from PWR's heritage of dependable rocket engines.

RL10 Engine Milestones

- 1959 First RL10 test firing
- 1963 First successful Atlas Centaur flight, two RL10s power upper stage
- 1964 Saturn S-4 launch, six RL10s power upper stage into orbit
- 1966 Atlas Centaur launch, two RL10s power upper stage, propels Surveyor spacecraft towards lunar landing (Mission paves the way for future Apollo astronaut landings)
- 1993 First DC-X "Delta Clipper" flight, four RL10A-5s power vehicle
- 1999 First successful Delta III flight, one RL10B-2 powers upper stage
- 2002 First Atlas V flight, two RL10A-4-2s power upper stage
First Delta IV flight, one RL10B-2 powers upper stage
- 2003 500th production RL10 delivered
- 2008 RL10 marks 45 years of service

RL10B-2 Characteristics

Thrust:	24,750 lb
Weight:	664 lb
Fuel:	Liquid hydrogen
Oxidizer:	Liquid oxygen
Mixture Ratio:	5.88:1
Specific Impulse:	465.5 sec
Length (stowed):	86.5"
(deployed):	163.5"
Diameter (nozzle extension):	84.5"

PRATT & WHITNEY ROCKETDYNE, a United Technologies company with sites throughout the United States, is dedicated to providing advanced, reliable, and cost-effective propulsion systems for spacecraft and missile propulsion systems and service.



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