TR-308 Dual Mode Liquid Apogee Engine

The TR-308 dual mode liquid apogee engine provides reliable, high-performance capabilities for long-life spacecraft operations. The engine, an improved version of the TR-306 LAE, features Northrop Grumman's high performance pintle injector design and has a specific impulse of 322 seconds. Designed for multiple starts, the engine was qualified for 24,190 seconds and a maximum single firing duration of 3,000 seconds. The engine's integral thrust chamber/nozzle extension (E=204) is manufactured of all-welded R512E silicide-coated C103 columbium. Four TR-308s serve as the on-board propulsion system for NASA's Chandra X-ray Observatory.

Heritage

Four engines flown on Chandra X-ray Observatory.

Availability

12 months after receipt of order.

Characteristics

Propellants	N_2O_4 and N_2H_4
Thrust	106 lbf
Mixture Ratio	1.00
Specific Impulse	322 seconds
Nozzle Expansion Area Ratio	204
Inlet Press	205 psia
Engine length	27.8 inches
Nozzle Exit Diameter	11.8 inches
Engine Weight	10.5 lbm
Qualification Life	24,190 seconds
Maximum Firing Duration	3,000 seconds
Throughput	7,983 lbm
Vibration (Qual)	7.36 g-rms