



BOLE DM-1 STATIC TEST

Boosting NASA's Space Launch System to the Moon and Beyond

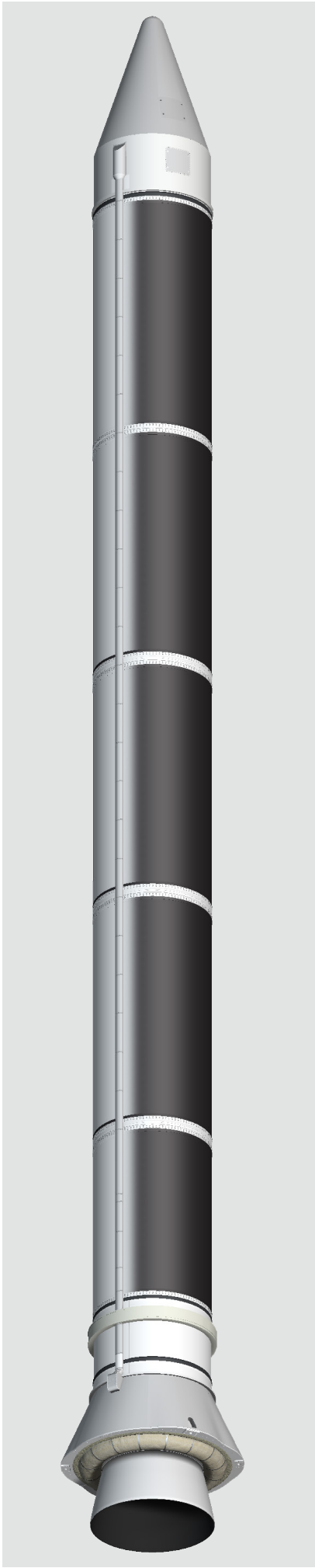
The Booster Obsolescence and Life Extension (BOLE) booster is the next generation five-segment solid rocket booster that will support NASA's Space Launch System (SLS) rocket on Artemis missions to the moon and beyond.

The BOLE booster's composite case will replace the refurbished Shuttle Program-era steel case design expended on the first eight

SLS flights and integrate upgraded structures, propellant materials and an electric thrust vector control system. This is the first demonstration motor (DM-1) static test of the BOLE booster required for certification.

Two advanced BOLE boosters are capable of providing over 3 metric tons of additional payload capacity to the SLS rocket and over 75% of the initial thrust at launch as it is propelled into space. Through the Artemis campaign, NASA will send astronauts to explore the moon for scientific discovery, economic benefits, and to build the foundation for the first crewed missions to Mars – for the benefit of all.

- The BOLE DM-1 motor is 156 feet in length and 12 feet in diameter
- Over 1.4 million pounds of propellant will burn for over 2 minutes to produce 3.9 million pounds of thrust
- This test will collect more than 757 channels of data



BOLE DM-1 STATIC TEST

TEST OBJECTIVES

- Demonstrate full-scale ballistics performance of the BOLE motor design
 - Pressure and thrust vs time, ignition characteristics, erosive burning, pressure drop, burn rate
- Demonstrate motor insulation performance on case acreage, domes and inhibitor regions
- Demonstrate nozzle ablative performance, and nozzle and electric thrust vector control (eTVC) vectoring performance
- Demonstrate performance of the composite case, case joints and joint seals
- Collect environmental conditions on the motor and test stand including shock and vibration, acoustics, temperatures, and plume impacts

	SLS Five-Segment Solid Rocket Booster (RSRMV)	BOLE
Length	154 feet	156 feet
Motor Case Composition	Steel	Carbon Fiber Composite
Motor Diameter	146.4 inches	148.5 inches
Nozzle Diameter	12.7 feet	14.4 feet with a 2-foot extension
Propellant Weight	1.39 million pounds	1.48 million pounds
Maximum Thrust	3.6 million pounds	3.97 million pounds-force
Design's Maximum Expected Operating Pressure	1016 psia	1330 psia
Propellant	Polybutadiene acrylonitrile (PBAN)	Hydroxyl-terminated polybutadiene (HTPB)
Thrust Vector Control	Hydrazine-powered	Electrically-powered
Impulse	3.9% increase in specific impulse and 11.7% increase in total impulse from RSRMV to BOLE	

Nominal BOLE and SLS Five-Segment Solid Rocket Boosters (RSRMV) Pressure Traces

