



Space Launch System Core Stage

NASA's Space Launch System (SLS) core stage is the world's tallest rocket stage. Towering 212 feet with a diameter of 27.6 feet, it stores cryogenic liquid hydrogen and liquid oxygen and all the systems that will feed the stage's four RS-25 engines.

It also houses the flight computers and much of the avionics needed to control the rocket's flight. The core stage is designed to operate for approximately 500 seconds before reaching low-Earth orbit and separating from the upper stage and Orion spacecraft.

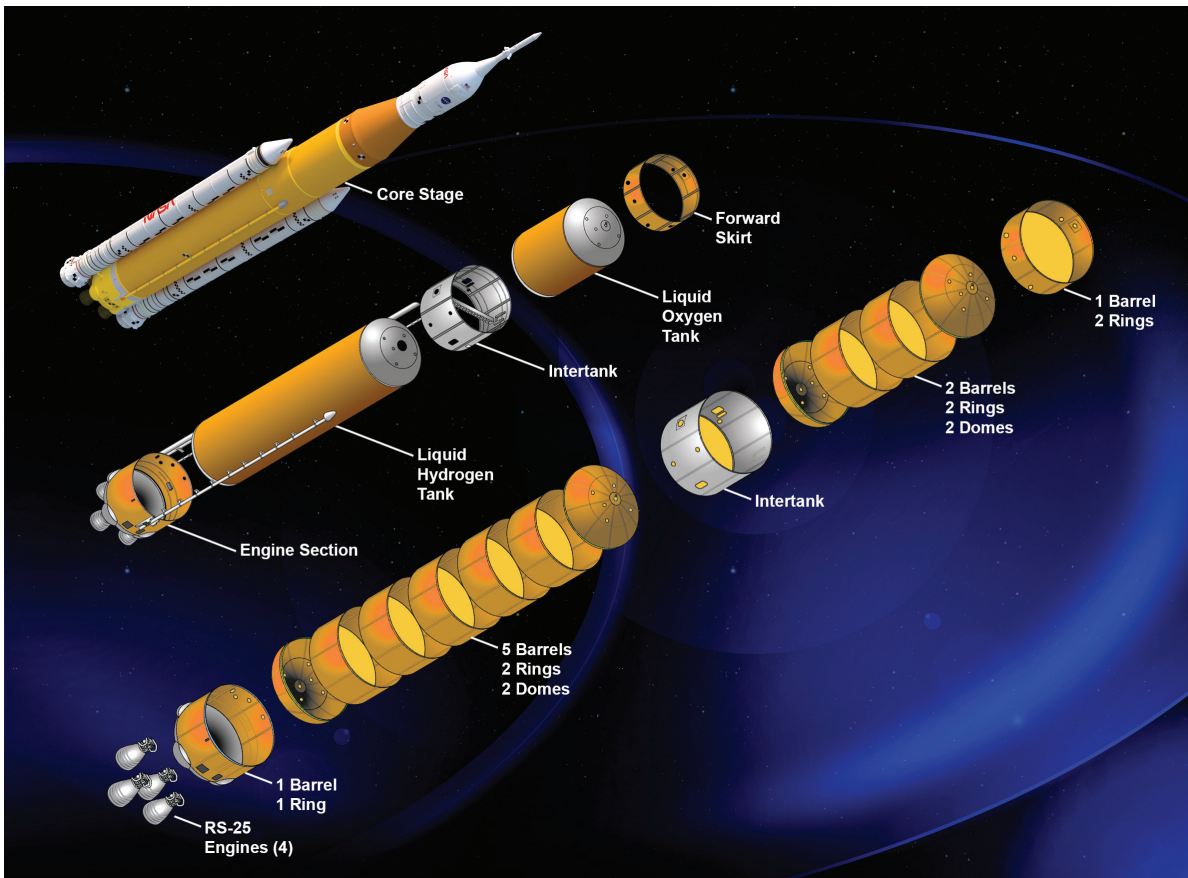
SLS is an advanced, super heavy-lift launch vehicle that will provide an entirely new capability for science and human exploration beyond Earth's orbit. With unmatched payload mass and volume capability, SLS is the only rocket that can send the Orion spacecraft,

astronauts, and supplies to the Moon on a single mission. This reduces the number and complexity of in-space operations and increases the opportunities for mission success.

The core stage serves as the backbone of the rocket, supporting the weight of the payload, upper stage, and crew vehicle, as well as structurally supporting and carrying the thrust of its four RS-25 engines and two five-segment solid rocket boosters attached to the engine and intertank sections.

The core stage is the same diameter as the space shuttle external tank and is covered with an orange spray-on foam to insulate the cryogenic propellants. The stage is made up of 10 major barrel sections, four dome sections, and seven rings. Each cylindrical barrel section consists of eight aluminum panels that

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vary in length and height. Those components are welded to form five major components: the liquid hydrogen and liquid oxygen tanks, engine section, intertank, and forward skirt. Those five major components are joined to form the completed core stage.

Boeing, the prime contractor for the SLS core stage, uses state-of-the-art manufacturing equipment to build the stage at NASA's Michoud Assembly Facility in New Orleans. Michoud is a unique advanced manufacturing facility where NASA has built spacecraft components for decades, including the space shuttle's external tanks and Saturn launch vehicle stages.

Structurally similar versions of the core stage's intertank, engine section, and liquid oxygen and liquid hydrogen tanks were built and tested to ensure the stage can withstand the SLS flight environment.

NASA and Boeing are building the core stages for the Artemis II and III missions. Every SLS configuration uses the core stage with four RS-25 engines. The first SLS vehicle, called Block 1, can send more than 27 metric tons (t) or 59,525 pounds (lbs.) to orbits beyond the Moon. As the SLS rocket evolves, it will send even heavier and larger payloads to the Moon and deep space.



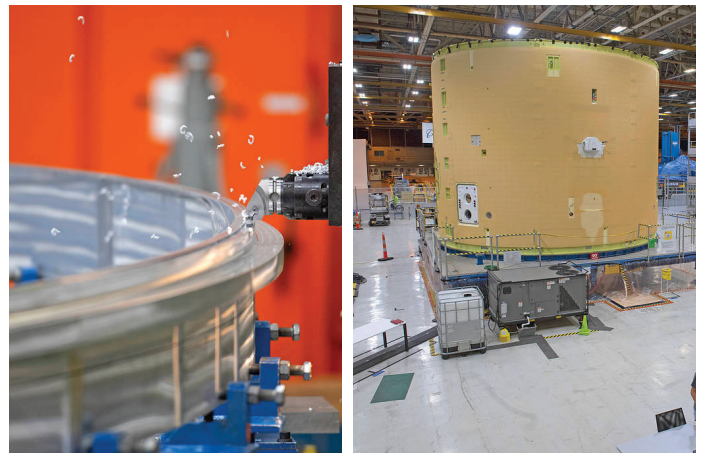
Artemis I core stage green run test in the B-2 test stand at NASA's Stennis Space Center.



Artemis I core stage removal from B-2 test stand at NASA's Stennis Space Center following successful green run test.

Core Stage Facts

Length	Approximately 212 feet (64.6 meters)
Diameter	27.6 feet (8.4 meters)
Empty Weight	Approximately 188,000 lbs (85,275 kg)
Capacities	Liquid Hydrogen (LH2) 537,000 gallons (2 million liters) (317,000 pounds)
	Liquid Oxygen (LOX) 196,000 gallons (741,941 liters) (1.86 million pounds)
Material	Aluminum 2219



Left: A ring that will eventually help form the Artemis III core stage is trimmed at the ring machining center at NASA's Michoud Assembly Facility in New Orleans. Each core stage structure has rings that attach the pieces together to produce one stage during final assembly.

Right: Technicians manufacturing NASA's SLS core stage intertank section for the Artemis II lunar mission. Manufacturing is performed at NASA's Michoud Assembly Facility.

For more information on SLS, visit:

<http://www.nasa.gov/sls/>

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