

NASA'S Booster Fabrication Facility

Historic Facility Powers Future Spaceflight

The Booster Fabrication Facility (BFF) is a 45-acre site at NASA's Kennedy Space Center in Florida, located near the Vehicle Assembly Building and the mobile launcher site. Northrop Grumman, lead contractor for boosters, and NASA engineers use the facility to refurbish, manufacture and assemble the aft skirt assembly and forward assembly for the twin solid rocket boosters on the Space Launch System (SLS), the agency's powerful, deep space rocket.

Refurbishing and Upgrading

The first eight missions of SLS will use upgraded booster hardware from the Space Shuttle Program. These heritage structures are refurbished inside the nearby Hangar AF complex at Cape Canaveral Air Force Station in Florida. Once engineers apply protective coatings and complete evaluations, booster components are transferred to the Booster Fabrication Facility to continue the processing and upgrades for SLS. The structures are enhanced to better accommodate forces expected during launch and flight.

The major physical difference between the shuttle and SLS boosters is the addition of a fifth propellant segment, compared to the four-segment shuttle booster. Each 17-story-tall booster burns 6 tons of solid propellant every second (or 1,385,000 pounds in 2 minutes), producing a max thrust of 3.6 million pounds of thrust — more than 75% of the total maximum thrust of 8.8 million pounds at liftoff.

The Booster Fabrication Facility consists of seven buildings constructed between 1986 and 1992. Formerly known as the Assembly and Refurbishment Facility, it began operation in 1987 to assemble the solid rocket boosters for the space shuttle. Today's site includes facilities for the SLS Program's solid rocket booster processing and administrative offices. The buildings that most significantly contribute to booster hardware processing include the Manufacturing Building, Multi-Purpose Logistics Facility and Aft Skirt Test Facility.

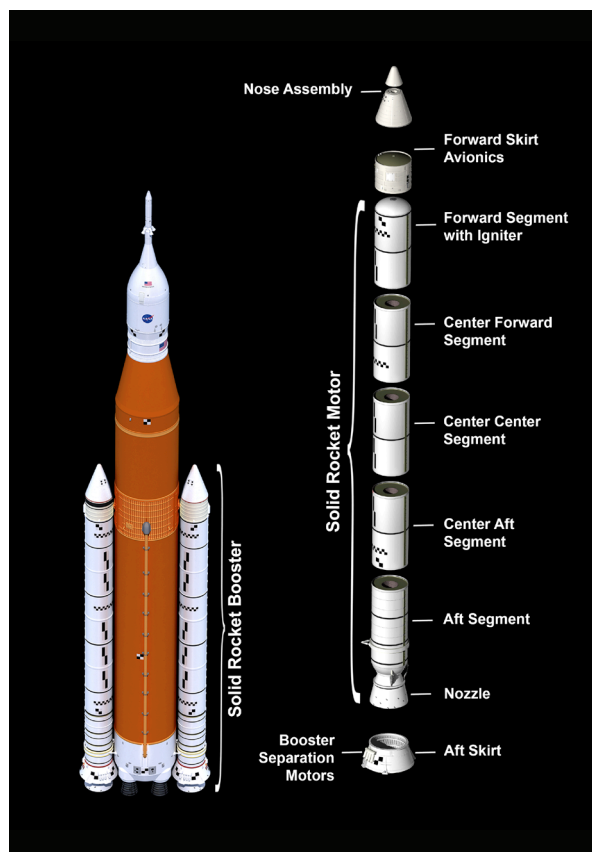


Diagram of five-segment solid rocket booster for SLS

The BFF Manufacturing Building

NASA uses the Manufacturing Building to assemble the non-propellant booster elements. This includes assembly of the forward and aft skirts, nose caps and thrust vector control components, application of the insulation (thermal protection system), and installation of electronic and guidance systems. The facility is listed with the National Register of Historic Places for its contributions to the Space Shuttle Program.

NASAfacts



The forward skirt assembly includes the nose cap and the forward skirt, or top part, of the SLS rocket booster

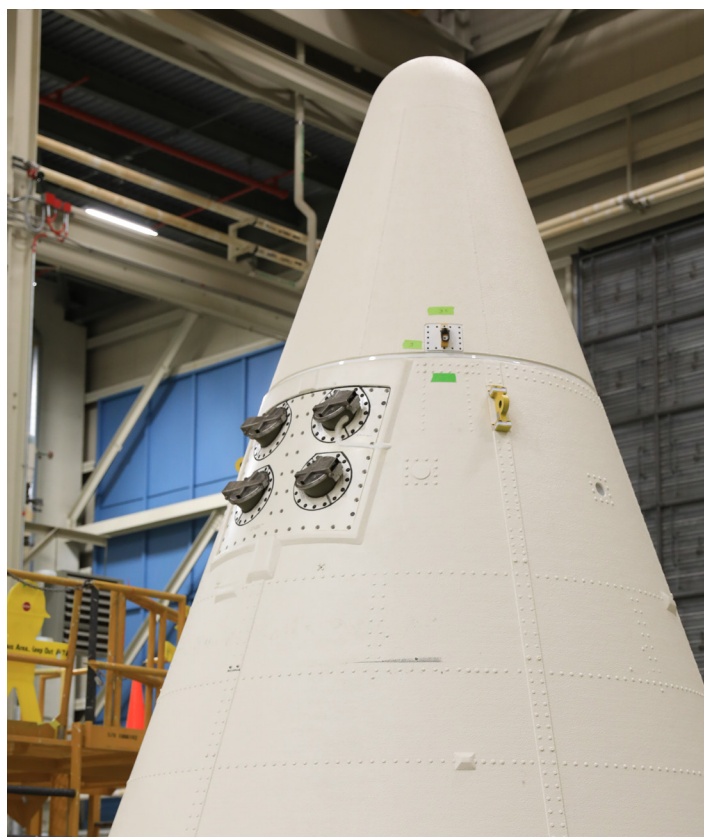
The BFF Multi-Purpose Logistics Facility

The Multi-Purpose Logistics Facility was built in 1988 as an addition to the BFF complex. Northrop Grumman builds flight hardware components in Utah and delivers them to this facility at Kennedy where they are inspected. It also serves as a climate-controlled storage facility for critical SLS booster flight hardware components.

The BFF Aft Skirt Test Facility

The Aft Skirt Test Facility includes two test stands to support booster aft skirt assembly operations. The booster aft skirts house the thrust vector control system, which controls 70% of the steering during SLS booster initial ascent. The system's actuators are the electromechanical mechanisms that direct the vehicle's propulsion system, and are pressure-and performance-tested at the facility before each flight.

The solid rocket boosters for SLS have three main assemblies. The motor segments are produced in Utah by Northrop Grumman then shipped to Kennedy. Northrop Grumman produces the aft skirt and forward assemblies at the BFF. All three booster assemblies come together on the Mobile Launcher platform in the Vehicle Assembly Building at Kennedy, where they're mated and stacked before the rocket's core stage is attached.



Booster forward skirt for Artemis I

Aft Skirt Assembly

The aft skirt assembly contains the aft skirt and the thrust vector control system, which moves the nozzle to steer the SLS rocket based on commands from the booster avionics located in the forward skirt assembly. Four booster separation motors are installed on each aft skirt to separate the boosters away from the core stage during flight when they are no longer needed. These small solid rocket motors produce 20,000 pounds of thrust during a one-second burn. During processing, the aft segment is attached to the aft skirt and aft exit cone that covers the nozzle to comprise the aft skirt assembly.

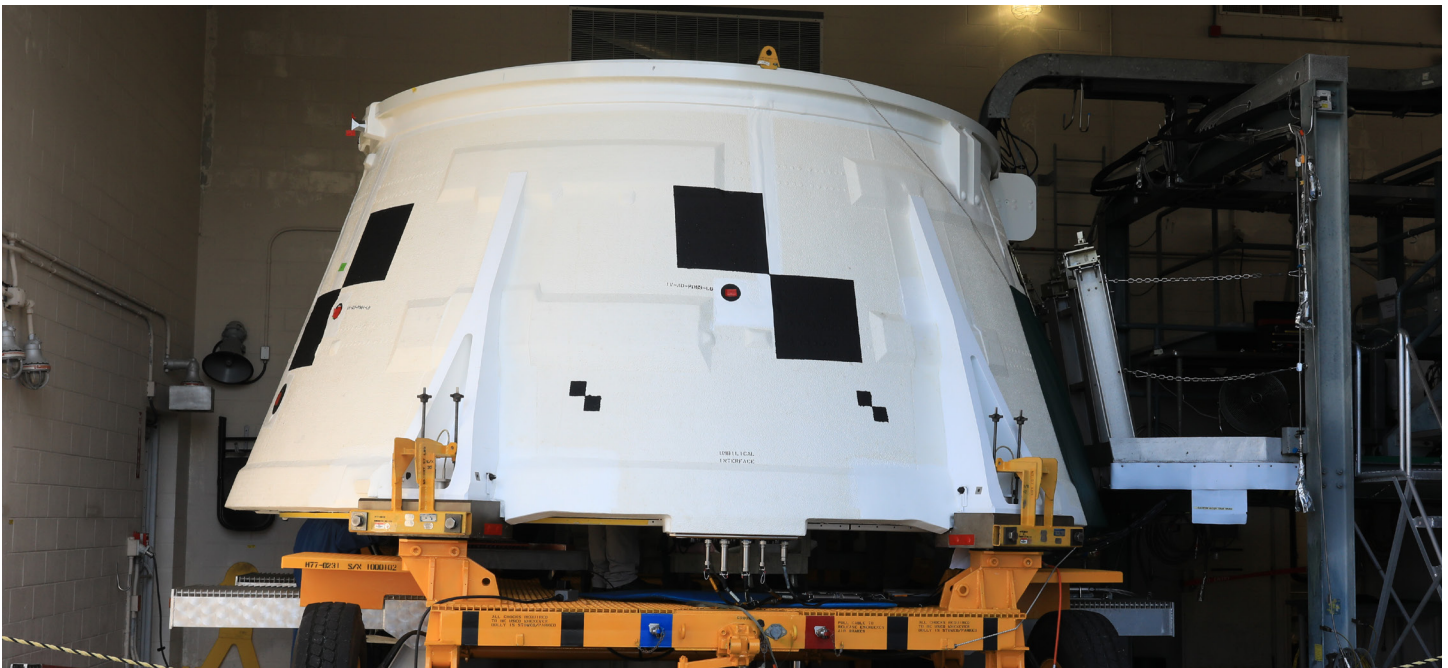
Forward Skirt Assembly

The forward skirt assembly includes the nose cap and the forward skirt of the booster. The forward skirt houses the avionics and serves as a critical connection point that carries most of the booster's thrust to the SLS during launch. It includes batteries, avionics and various sensors to monitor booster conditions and transmit flight control data to the avionics in the aft skirt assembly and core stage forward skirt. Each forward assembly, like the aft skirt assembly, is outfitted with four booster separation motors.

NASA's Marshall Space Flight Center in Huntsville, Alabama, oversees the SLS Program. Kennedy Space Center and nearby Cape Canaveral Air Force Station have served for decades as the agency's primary rocket launch area for science, human and interplanetary spacecraft. The facilities and programs on the 6,000-acre spaceport are crucial in advancing NASA's Artemis missions to land the first woman and the next man on the Moon, create a permanent human presence there and explore deep space.



Booster frustum (front) and nose cap (back) for Artemis I



Booster aft skirt assembly for Artemis I

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For more information about NASA's Artemis program
visit: <https://www.nasa.gov/artemis>

For more information about NASA's Space Launch System,
visit: <https://www.nasa.gov/sls>

For more information about Kennedy and its role in the nation's space program,
visit: <https://www.nasa.gov/centers/kennedy>