

SLS FIVE-SEGMENT BOOSTER

Boosting NASA's Space Launch System

Largest solid rocket motor ever built for flight. NASA's Space Launch System (SLS) is an advanced, heavy-lift launch vehicle that provides an entirely new capability for science and human exploration beyond Earth's orbit.

SLS will be the most powerful rocket in history, and it is designed to be flexible and

evolvable, to meet a variety of crew and cargo mission needs. SLS utilizes Northrop Grumman's five-segment boosters to propel the rocket off of the launch pad and for the first two minutes of flight.

- SLS booster qualification is complete
 - On schedule to meet 2021 flight
- SLS boosters incorporate design and technology improvements
 - Enhanced affordability
 - Reliability improvements result in reduced risk
 - Increased performance
- New processing incorporated

BOOSTER FACTS

Burns 1,385,000 pounds of propellant in two minutes. That is an average of 5.5 tons of propellant every second

Each booster produces 3,600,000 pounds of maximum thrust – greater than fourteen 4-engine Boeing 747s at full take-off power

During operation, the temperature of the five-segment booster motor chamber gases reach 5,600°F. At this temperature, steel does not melt – it boils

The stacked booster is 177 feet tall, or as tall as a 17-story building

SLS FIVE-SEGMENT BOOSTER

THE FIVE-SEGMENT BOOSTER CYCLE

CASE PREPARATION

After case parts are joined into five primary or casting segments, they are insulated, lined and prepared for casting.

PROPELLANT CASTING

Each segment is filled with about 280,000 pounds of propellant. The propellant is allowed to solidify or "cure" for the next four days.

NOZZLE MANUFACTURE

The nozzle is a complex structure of glass- and carbon-cloth material, steel and aluminum. The carbon and glass materials must be able to withstand temperatures as high as 3,700°F.

MOTOR FINAL ASSEMBLY

All motor segments undergo X-ray and ultrasonic inspection before being certified for launch. The forward nozzle assembly is installed in the aft segment and the igniter is installed in the forward segment.

MOTOR SHIPPING

Loaded segments will be transported by special vehicle to Northrop Grumman's Corinne, Utah, railhead for journey by train to Kennedy Space Center, Florida.

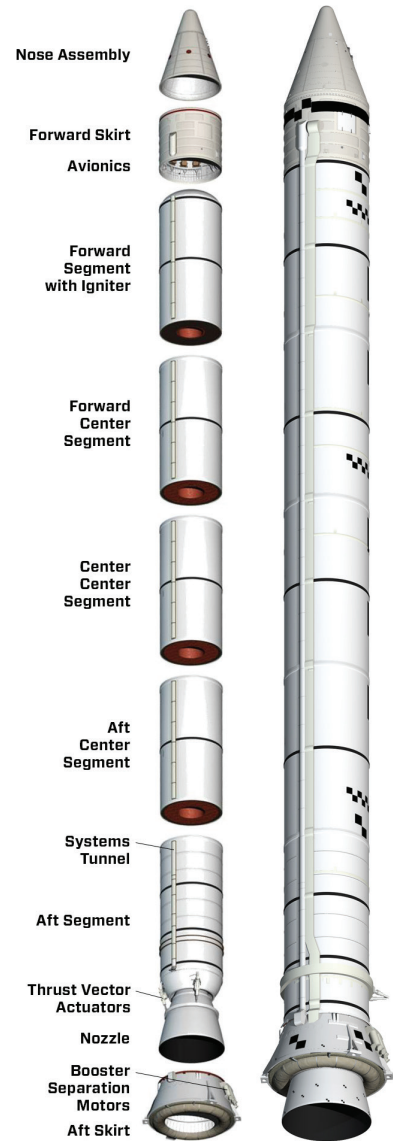
BOOSTER ASSEMBLIES

Aft skirt, forward skirt and nose assemblies are processed at KSC and are moved to the Rotation, Processing and Surge Facility and Vehicle Assembly Building where they are mated with the solid rocket motor segments.

STACKING

Once at KSC, the segments are moved to the Vehicle Assembly Building where they are stacked and mated to the core stage tank.

THE FIVE-SEGMENT BOOSTER COMPONENTS



Static Test Firing at Promontory, Utah

northropgrumman.com

©2020 Northrop Grumman Corporation.
All Rights Reserved
DS-26

**NORTHROP
GRUMMAN**