



SPACE LAUNCH SYSTEM

JULY – SEPTEMBER 2020

LAUNCH VEHICLE STAGE ADAPTER DELIVERED

LAUNCH VEHICLE STAGE ADAPTER COMPLETES JOURNEY



The launch vehicle stage adapter (LVSA), which connects the core stage and upper stage, shipped on NASA's Pegasus barge from Marshall Space Flight Center in Huntsville, where it was manufactured, to Kennedy Space Center in July 2020.

The penultimate piece of hardware for the [Artemis I](#) test flight around the Moon shipped from NASA's Marshall Space Flight Center in July and arrived at the agency's Kennedy Space Center in Florida. The launch vehicle stage adapter (LVSA) [connects](#) the core stage of NASA's SLS rocket to the upper stage, called the [interim cryogenic propulsion stage](#). The cone-shaped connector also helps protect the RL10 engine housed in the upper stage, which will provide the power necessary to leave Earth's orbit and send the [Orion](#) spacecraft on its journey to the Moon.

"The launch vehicle stage adapter for NASA's Space Launch System rocket was the final piece of Artemis I rocket hardware built exclusively at NASA's Marshall Space Flight Center," said Marshall Director Jody Singer. "This milestone comes as Marshall teams just completed the structural test campaign of the SLS rocket that confirmed the rocket's structural design is ready for Artemis missions to the Moon."

Read more about shipping the LVSA: go.nasa.gov/313a910

Read more about LVSA's arrival at Kennedy Space Center: go.nasa.gov/31lbg2q

NASA, NORTHROP FIRE FULL-SCALE BOOSTER FOR FUTURE FLIGHTS



NASA and Northrop Grumman successfully completed the Flight Support Booster-1 (FSB-1) test in Promontory, Utah, Sept. 2. The NASA and Northrop Grumman team will use data from the test to evaluate the motor's performance using potential new materials and processes for Artemis missions beyond the Moon landing in 2024.

As NASA begins assembling the boosters for the [Space Launch System](#) (SLS) rocket that will power the first [Artemis](#) mission to the Moon, teams in Utah are evaluating materials and processes to improve rocket boosters for use on missions after Artemis III. NASA and Northrop Grumman, the SLS booster lead contractor, completed a full-scale booster test for NASA's SLS rocket in Promontory, Utah, Sept. 2. The team will use data from the test to evaluate the motor's performance using potential new materials and processes that can be incorporated into future boosters. NASA has a contract with Northrop Grumman to [build boosters](#) for future rocket flights.

For a little over two minutes — the same amount of time that the boosters power the SLS rocket during liftoff and ascent for each SLS mission — the five-segment flight support booster fired in the Utah desert, producing more than 3 million pounds of thrust. NASA and Northrop Grumman have previously completed three development motor tests and two qualification motor tests for the powerhouse five-segment solid rocket boosters, which are the largest ever built for spaceflight. The Flight Support Booster-1 ([FSB-1](#)) test builds on prior tests with the introduction of propellant ingredients from new suppliers for boosters on SLS rockets to support flights after Artemis III.

Read more: [go.nasa.gov/30665Ry](https://www.nasa.gov/30665Ry)

COUNTDOWN TO GREEN RUN HOT FIRE




The SLS rocket's first core stage built for flight will complete the Green Run test series with a full-up hot fire test scheduled to last up to eight minutes. The stage is installed in the B-2 Test Stand at Stennis Space Center.

NASA is in the final rounds of the [Green Run test series](#), which will verify the SLS core stage is ready for the Artemis missions. The Artemis I core stage was installed in the B-2 test stand at Stennis Space Center in January to begin the eight-part Green Run test series, which will ensure the flight hardware is ready for the first and future Artemis missions. The last of the eight tests is a hot fire test with all four of the stage's RS-25 engines firing for up to eight minutes. The test replicates the launch by loading the propellants and allowing them to flow throughout the system as the four RS-25 engines fire simultaneously to demonstrate that the engines, tanks, fuel lines, valves, pressurization system, and software can all perform together just as they will on launch day.

Engineers have been progressing through the series of eight Green Run tests on the core stage of the SLS rocket, continuing progress toward a milestone hot fire test in November. Operators concluded a test of the stage's thrust vector control system on the historic B-2 Test Stand at NASA's Stennis Space Center near Bay St. Louis, Miss., Sept. 13. The test provided critical verification of the control system and its related hydraulics as operators [gimbaled the stage's four RS-25 engines](#) just as they must move during flight to steer the rocket and maintain a proper trajectory. The stage now is set for two more tests – a simulated countdown demonstration and wet dress rehearsal – directly leading to the hot fire of all four RS-25 engines, just as during an actual flight.

Read more about Green Run testing and Artemis missions: go.nasa.gov/3o9tHyO

STACKING MAKES PERFECT



Technicians with NASA's Exploration Ground Systems (EGS) are preparing to assemble the SLS solid rocket boosters that will help power the Artemis I mission.

EGS teams are rehearsing booster stacking operations inside the Vehicle Assembly Building (VAB) at Kennedy Space Center in Florida. The team is using full-scale replicas of booster segments, referred to as pathfinders, for the practice sessions in the VAB. The exercises help ensure successful handling of the 177-foot-tall flight boosters that will help power the Artemis I mission. The flight boosters will be stacked on the mobile launcher later this year, following completion of Green Run testing of the rocket's core stage.

Read more: go.nasa.gov/36elvHh

'WORMING' UP SOME COOL BOOSTERS



When NASA's Artemis I mission launches, the agency's iconic "worm" will be along for the ride. Teams at Kennedy Space Center have painted the historic logo in bright red on the SLS solid rocket boosters and Orion spacecraft. The worm was introduced in 1975 and was incorporated into many of NASA's next-generation programs. It was retired in 1992, but made a comeback in 2020 as the agency ushers in a new era of human spaceflight.

Read more: go.nasa.gov/33hpggE

WHAT'S NEW IN SLS SOCIAL MEDIA

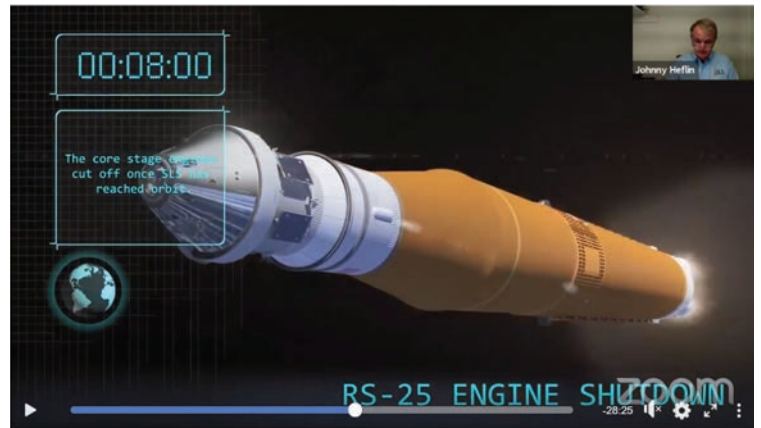
BOOSTER TEST LIGHTS UP SOCIAL MEDIA

On Sept. 2, teams from NASA and booster prime contractor Northrop Grumman conducted a ground test of Flight Support Booster-1 (FSB-1) to test materials and propellant for flight beyond the third Artemis mission. The two-minute hot fire enabled engineers to evaluate the motor's performance using potential new materials and processes.

Watch the video here: youtu.be/mWzx8LGP9K8



SLS ON THE VIRTUAL ROAD



The SLS Program isn't just about launching the world's most powerful rocket to the Moon, Mars, and beyond. Well, that is the primary objective. But the program is also committed to reaching out to audiences and keeping them informed about the rocket's missions, its progress to the pad, and promoting interest in science, technology, engineering, and math. We're going to need the Artemis generation to help us explore the solar system with SLS! Typically, the SLS Program hits the road most weeks of the year to bring news of the rocket and the Artemis program to audiences nationwide. We can't do that right now, but we can bring all the exciting news right into your virtual classroom. SLS engineers and industry partners have been hitting the virtual road with a series of webinars and podcasts. Ready to dive into more rocket news? Need help getting fired up for the Green Run hot fire?

Here are some webinars and podcasts to check out:

[SLS Chief of Staff Tyler Nester chats with the Casual Space podcast](#)

[SLS Boosters Manager Bruce Tiller updates the Museum of Life & Science](#)

[SLS Boosters Deputy Manager Dave Reynolds presents to the Roper Mountain Science Center](#)

[SLS Liquid Engines Manager Johnny Heflin briefs the San Diego Air & Space Museum](#)

[SLS Utilization Manager Rob Stough talks to the Carnegie Science Center](#)

[Industry partner Tony Castilleja from Boeing speaks to Space Center Houston](#)

[Industry partner Scott Duncan from Aerojet Rocketdyne virtually visits the California Science Center](#)

Be sure to check SLS social media for the next SLS webinar!

SPACEFLIGHT PARTNERS:

Kirkhill Inc.





NUMBER OF EMPLOYEES: 550

LOCATION: Brea, California

WHAT THEY DO FOR SLS:

Kirkhill Inc. produces insulating materials for the SLS solid rocket motors. Materials include silica-filled EPDM, silica-filled NBR, PBI-filled NBR, and natural rubber. Kirkhill insulating materials were used on the recent Flight Support Booster-1 that successfully test-fired in September 2020. The insulation in the booster motors protects the cases and igniters' metal hardware from the harsh internal motor environment. It also protects the external motor joints from weather on the launch pad and from heating during flight. Kirkhill's engineered, high-performance elastomer products are used on commercial, military, and business aircraft around the world as well as rockets and satellites. Kirkhill Inc. is a valuable partner in ensuring the consistency, dependability, and safety of the SLS Program and has been a key team member for many years.

GET THE LATEST SLS UPDATES SENT TO YOUR INBOX EACH MONTH!



Top Three Countdown


What you need to know right now

- 3... Final test — Crews at Marshall Space Flight Center wrapped up a three-year test campaign of the SLS rocket's structural components. Read [more](#)
- 2.. Prepping for the second flight — NASA has begun assembling the Orion stage adapter that will send crew into orbit on the Artemis II mission. Read [more](#).
1. To the top — The launch vehicle stage adapter, which attaches to the top of the SLS core stage to connect with the upper stage, arrives at Kennedy Space Center. Read [more](#).

Pictures of the Month

We know how to wow

There's been a lot of SLS progress lately, so this edition includes two "wow" images:



Technicians with NASA's Exploration Ground Systems moves the launch vehicle stage adapter (LVSA) for the SLS rocket to the Vehicle Assembly Building (VAB) at Kennedy Space Center July 30 for processing. The LVSA connects the SLS core stage to the rocket's upper stage and will remain in the VAB until it's time for stacking on the mobile launcher ahead of the Artemis I launch.

Every day, the SLS rocket gets closer to launch. Get updates in your inbox each month by subscribing to [SLS in 3..2..1.](#)

FOLLOW THE PROGRESS OF NASA'S NEW LAUNCH VEHICLE FOR DEEP SPACE:

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