



STENNIS SPACE CENTER AND GREEN RUN TESTING



WHAT IS GREEN RUN?

Green Run is the term used for the **FIRST “FULL-UP” TEST** of the Space Launch System core stage and all of its integrated systems. The testing replicates the launch procedure, even to the point of firing the stage’s **FOUR RS-25 ENGINES SIMULTANEOUSLY**, as during an actual flight, generating 1.6 million pounds of combined sea-level thrust.

WHAT IS THE SPACE LAUNCH SYSTEM CORE STAGE?

NASA is building the Space Launch System to carry astronauts on deep space missions to the **MOON BY 2024** as part of the **ARTEMIS PROGRAM** and, ultimately, to Mars. The core stage is the first stage of the rocket that ignites to help power liftoff.

WHY IS IT TESTED?

The Space Launch System has not yet flown. It is tested prior to its maiden flight in order to identify and address any issues earlier rather than later, to increase the probability of successful missions, and to **ENSURE ASTRONAUT SAFETY**.

WHAT IS NEXT?

Following the hot fire test, operators will perform necessary **REFURBISHMENT WORK** on the core stage and begin putting systems into flight configuration. The stage will travel on NASA’s **Pegasus** barge to Kennedy Space Center to be mated with other Space Launch System stages and parts. The full rocket then will be moved to a launch pad and prepped for launch of the Artemis I mission.

HOW IS IT BEING TESTED?

The Space Launch System **FLIGHT CORE STAGE** was installed vertically on the B-2 Test Stand at Stennis Space Center in January 2020. It then was anchored in place and all systems connected.

A series of tests are being conducted to ensure stage systems are functioning as needed.

These tests include:

- powering up the core stage’s electronic **AVIONICS SYSTEM**.
- performing propulsion system and engine checks.
- conducting hydraulics and **THRUST VECTOR CONTROL SYSTEM** tests.

The thrust vector control system test ensures operators can gimbal engines during a hot fire, just as they must move during launch to maintain the rocket’s needed trajectory.

Operators will establish and confirm the correct **“POWER UP” PROCEDURE** for the stage to ensure that all systems and equipment come on line as needed.

The test team will conduct a **“SIMULATED” COUNTDOWN**, in which operators walked through the hot fire procedure without actually flowing propellants through the core stage systems.

A **“WET DRESS REHEARSAL”** will be conducted in which propellants were flowed. The test team proceeded all the way up to the point of actual engine ignition before concluding the exercise. Various anomalies were introduced during the exercise to train the team in identifying and addressing issues that may arise.

The concluding **HOT FIRE** will test the core stage just as it must operate during launch. All four RS-25 engines will fire for eight minutes to produce a combined 1.6 million pounds of sea-level thrust.

Front Image: The Space Launch System core stage installed on the B-2 Test Stand at Stennis Space Center