

NASA continues Artemis moon rocket engine tests with first hot fire of 2024

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NASA completed a full-duration, 500-second hot fire of an RS-25 certification engine Jan. 17, continuing a critical test series to support future SLS (Space Launch System) missions to the moon and beyond as NASA explores the secrets of the universe for the benefit of all. Credit: NASA/Danny Nowlin

NASA continued a critical test series for future flights of NASA's SLS

(Space Launch System) rocket in support of the Artemis campaign on Jan. 17 with a full-duration hot fire of the RS-25 engine on the Fred Haise Test Stand at NASA's Stennis Space Center near Bay St. Louis, Mississippi.

Data collected from the test series will be used to certify production of new RS-25 engines by lead contractor Aerojet Rocketdyne, an L3Harris Technologies company, to help power the SLS rocket on future Artemis missions to the moon and beyond, beginning with Artemis V.

Teams are evaluating the performance of several new engine components, including a nozzle, hydraulic actuators, flex ducts, and turbopumps. The current series is the second and final series to certify production of the upgraded engines. NASA completed an initial 12-test certification series with the upgraded components in June 2023.

During the Jan. 17 test, operators followed a "test like you fly" approach, firing the engine for the same amount of time—almost eight-and-a-half minutes (500 seconds)—needed to launch SLS and at power levels ranging between 80% to 113%.

The Jan. 17 test comes three months after the current series began in October. During three tests last fall, operators fired the engine for durations from 500 to 650 seconds. The longest planned test of the series occurred on Nov. 29 when crews gimbaled, or steered, the [engine](#) during an almost 11-minute (650 seconds) hot fire. The gimbaling technique is used to control and stabilize SLS as it reaches orbit.

Each SLS flight is powered by four RS-25 engines, firing simultaneously during launch and ascent to generate over 2 million pounds of thrust.

The first four Artemis missions with SLS are using modified [space shuttle](#) main engines that can power up to 109% of their rated level. The

newly produced RS-25 engines will power up to the 111% level to provide additional thrust. Testing to the 113% power level provides an added margin of operational safety.

With the completion of the test campaign in 2024, all systems are expected to be "go" for production of 24 new RS-25 engines for missions beginning with Artemis V.

Through Artemis, NASA will establish a long-term presence at the moon for [scientific exploration](#) with commercial and international partners, learn how to live and work away from home, and prepare for future human exploration of Mars.

Provided by NASA

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