

Thaxted Astronomical Society

News

Features

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Most Powerful Rocket

Everⁿ Built

<https://www.dailymail.co.uk/sciencetech/article-7869303/Most-powerful-rocket-built-emerges-hanger-loaded-BARGE.html>

'Most powerful rocket ever built' emerges from its hanger and is loaded onto a BARGE for transport to Mississippi in preparation for NASA's 2024 Moon mission

Daily Mail 9th December 2019 >

- NASA's **Space Launch System** was constructed in a facility in New Orleans
- The rocket core has been loaded onto NASA's 310-foot-long Pegasus barge
- It will be ferried to the Stennis Space Center for comprehensive testing
- Once these are done the core will sail to Cape Canaveral for launch preparations

The most powerful rocket ever built has emerged from its hanger and has been loaded onto a barge for transport from Louisiana to Mississippi for testing.

The core rocket stage of the so-called 'Space Launch System' (SLS) was constructed at NASA's Michoud Assembly Facility in New Orleans.

It will be shipped in the 310 feet (94 metre) -long container boat — named the 'Pegasus' — up the Peal River to NASA's Stennis Space Center in Mississippi.

Here it will undergo a so-called 'Green Run Test' — during which its engines will be fired — after which the core will be ferried to the Kennedy Space Center in Florida.

Accompanied by a parade of NASA, Boeing and Aerojet Rocketdyne personnel, the the SLS core made the 1.3-mile journey from the Michoud factory in Louisiana to the Pegasus' dock on January 8.

The SLS will take the same journey along the waterways of Louisiana and Mississippi as the Saturn V rocket did when it was sent for testing as part of the Apollo program of the sixties and the seventies.

The Pegasus barge — which had previously been used to ferry tanks for the space shuttle — was made stronger and longer to accommodate the massive SLS hardware

'This is a historic moment for NASA's Artemis program and a proud time for the Space Launch System Core Stage team as the first flight article leaves the factory floor,' said NASA SLS Stages manager Julie Bassler.

'Roll out of the core stage to Stennis ahead of the core stage Green Run test series signals an exciting next phase as NASA prepares for the first Artemis launch.'

When the core arrives at the Stennis site, it will be lifted into a stand and subjected to comprehensive tests of both its avionics and propulsion systems as well as its four RS-25 engines, which will undergo an eight-minute test burn.

'Completion of this first-time build of the Space Launch System rocket's core stages puts humans on the cusp of a new era of space exploration,' said SLS Program Manager John Honeycutt.

NASA's SLS rocket is designed to evolve so a variety of missions can be accomplished — first to the Moon for the Artemis missions and then to Mars and other deep space destinations.

The most powerful rocket ever built has emerged from its hanger and has been loaded onto a barge (left) for transport from Louisiana to Mississippi for testing



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WHAT IS NASA'S SPACE LAUNCH SYSTEM?

Nasa's Space Launch System, or SLS, is an advanced launch vehicle that will 'provide the foundation for human exploration beyond Earth's orbit', according to the space agency.

Launching with unprecedented thrust power, SLS will carry crews of up to four astronauts in the agency's Orion spacecraft on missions to explore deep-space destinations.

Offering more payload mass, volume capability and energy to speed missions through space than any current launch vehicle, SLS is designed to evolve over several decades to keep up with modern technologies and payloads.

These include robotic scientific missions to places like the Moon, Mars, Saturn and Jupiter.

The rocket's first launch, which will be unmanned, is set for 2020 at Nasa's Kennedy Space Centre in Florida.

The initial configuration for what SLS can carry past low-Earth orbit and on to the moon is more than 26 metric tons, with a final configuration of at least 45 metric tons.

Nasa intends to send humans to 'deep-space' destinations such as Mars and the moon aboard the SLS, with a date for a mission to the red planet set for the 2030s.

SPACE LAUNCH SYSTEM CORE STATS

- Length > 212 feet
- Diameter > 27.6 feet
- Empty weight > 188,000 lbs
- Material > Aluminium 2219
- Engines > 4xRS-24
- Max Speed > Mach 23
- Capacity > 537,000 gallons of liquid hydrogen and 196,000 gallons of liquid oxygen

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CORE STAGE 101*

* Or: What you need to know about the Space Launch System Core Stage, the backbone of the rocket.

How Big is the SLS Core Stage?

- 212 Feet tall
- 27.6 Feet in diameter
- ~2.3M Pounds with propellant
- Largest rocket stage ever built
- Fuels world's most powerful rocket
- Fast ride – reaches Mach 23, faster than 17,000 MPH in 8.5 min

#JourneyToMars @NASA_SLS

- 1 Engine Section**
 - Delivering propellants from LH₂ and LOX tanks to 4 RS-25 engines
 - Avionics to steer the engines
 - Booster attach point
- 2 Liquid Hydrogen (LH₂) Tank**
 - Holds 537,000 gallons of LH₂ cooled to -423 °F
- 3 Intertank**
 - Joins LOX and LH₂ tanks
 - Booster attach point
 - Houses avionics and electronics
- 4 Liquid Oxygen (LOX) Tank**
 - Holds 196,000 gallons of LOX cooled to -297 °F
- 5 Forward Skirt**
 - Houses flight computers, cameras, and avionics – the “brains” of the rocket

LH₂ & LOX Tanks

- Fuels 4 engines to produce a total of 2M pounds of thrust
- Holds 733,000 gallons of propellant, enough to fill 63 large tanker trucks.

BIGGER TANKS. BOLDER MISSIONS.

#SLSFireUp +15

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WHEN IS NASA GOING BACK TO THE MOON?

In a statement in March, NASA Administrator Jim Bridenstine doubled down on plans to send humans first to the moon and then to Mars and said NASA is on track to have humans back on the moon by 2028.

The plan relies on the developing Space Launch System and Orion spacecraft, along with the Gateway orbital platform.

SLS and Orion are expected to be ready for their first uncrewed test flight in 2020.

Construction on Gateway – an orbiting lunar outpost – is expected to begin as soon as 2022.

'We will go to the Moon in the next decade with innovative, new technologies and systems to explore more locations across the lunar surface than ever before,' Bridenstine said.

'This time, when we go to the Moon, we will stay.

'We will use what we learn as we move forward to the Moon to take the next giant leap – sending astronauts to Mars.'