

Orion's European module ready for testing

November 11 2015



A look at the propulsion side of the Orion European Service Module (ESM) structural test model. Airbus Defence and Space is preparing to deliver the ESM structural test model to NASA. The model is an exact copy of the flight model, only without the functionality. It will determine whether the structural and weight specifications have been met, and whether the module lives up to NASA's crew safety requirements. Testing will take place at NASA's Plum Brook Station test centre in Ohio, USA. The design of the ESM is based on the Automated Transfer Vehicle (ATV), the European supply craft for the International Space Station. It is a cylindrical module with a diameter of 4.5 metres and a total length – main engine excluded – of 2.7 metres. It is fitted with four solar array 'wings'

with a span of 18.8 metres. Besides propulsion and power, the ESM is also equipped with oxygen tanks to supply the crew. Credit: Airbus Defence and Space SAS 2015

A test version of ESA's service module for NASA's Orion spacecraft arrived in the US yesterday after leaving its assembly site in Italy last weekend.

The European Service Module is adapted from Europe's largest spacecraft, the Automated Transfer Vehicle, which completed its last mission to the International Space Station in February. Just nine months later, prime contractor Airbus Defence & Space in Bremen, Germany, has delivered the first test module.

The module sits directly below Orion's crew capsule and provides propulsion, power, thermal control, and water and air for four astronauts. The solar array spans 19 m and provides enough to power two households.

A little over 5 m in diameter and 4 m high, it weighs 13.5 tonnes. The 8.6 tonnes of propellant will power one main engine and 32 smaller thrusters.

The structural test article delivered today was built by Thales Alenia Space in Turin, Italy. Following initial tests in Europe, it will now undergo rigorous vibration tests in NASA's Plum Brook Station in Ohio to ensure the structure and components can withstand the extreme stresses during launch.

"This is the first major element of the European Service Module to be delivered to the US," notes Philippe Deloo, ESA's programme manager,

"demonstrating the commitment of ESA to this human exploration endeavour."



A test version of ESA's service module for NASA's Orion spacecraft at Thales Alenia Space in Turin, Italy, before shipping to USA. The module sits directly below Orion's crew capsule and provides propulsion, power, thermal control, and water and air for four astronauts. The solar array spans 19 m and provides enough to power two households. A little over 5 m in diameter and 4 m high, it weighs 13.5 tonnes. The 8.6 tonnes of propellant will power one main engine and 32 smaller thrusters. Following initial tests in Europe, it will now undergo rigorous vibration tests in NASA's Plum Brook Station in Ohio to ensure the structure and components can withstand the extreme stresses during launch. The European Service Module is adapted from Europe's largest spacecraft, the Automated Transfer Vehicle, which completed its last mission to the International Space Station in February 2015. Just nine months later, prime contractor Airbus Defence & Space in Bremen, Germany, has delivered the first

test module. Credit: Airbus

More than 20 companies around Europe are working on the project, most building on their expertise earned from the five Automated Transfer Vehicles that delivered cargo to the Space Station and reboosted its orbit from 2009 to 2015.

The first, uncrewed, launch of the full Orion vehicle is planned for 2018 with the first European Service Module. It will fly beyond the Moon and back, returning to Earth at higher speeds than any other previous spacecraft.

During the mission, the module will detach shortly before entry into Earth's atmosphere.

Provided by European Space Agency

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