

# **NASA Successfully Completes First Series of Ares Engine Tests**

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NASA engineers Thursday successfully completed the first series of tests in the early development of the J-2X engine that will power the upper stages of the Ares I and Ares V rockets, key components of NASA's Constellation Program. Ares I will launch the Orion spacecraft that will take astronauts to the International Space Station and then to the moon by 2020. The Ares V will carry cargo and components into orbit for trips to the moon and later to Mars.

NASA conducted nine tests of heritage J-2 engine components from December to May as part of a series designed to verify heritage J-2 performance data and explore performance boundaries. Engineers at NASA's Stennis Space Center near Bay St. Louis, Miss., conducted the tests on a heritage J-2 "powerpack," which, in a fully assembled engine, pumps liquid hydrogen and liquid oxygen into the engine's main combustion chamber to produce thrust. The test hardware consisted of J-2 components used from the Apollo program in the 1960s through the X-33 program of the 1990s.

"This series of tests is an important step in development of the J-2X engine," said Mike Kynard, manager of the upper stage engine for the Ares Projects at NASA's Marshall Space Flight Center in Huntsville, Ala. "We started with a number of objectives and questions we needed answers to as we work to complete designs of the J-2X engine. The data we have gained will be invaluable as we continue the design process."

Data obtained from the tests will be used to refine the design of the J-2X

pumps and other engine components to provide the additional performance required of this new engine. The J-2X engine is being designed to produce 294,000 pounds of thrust; the original J-2 produced 230,000 pounds of thrust.

The main objectives of the series were to resolve differences in heritage turbopump performance data and recent component-level tests, and investigate vibration and pressure drops through the turbopump inlet ducts. Tests in the series ran for durations up to 400 seconds and at power levels up to 274,000 pounds of thrust.

After the data from the test series has been reviewed and objectives met, Stennis will begin readying the test stand for the next series of tests, said Gary Benton, the J-2X project manager at Stennis.

Marshall manages the J-2X upper stage engine for the Constellation Program, based at NASA's Johnson Space Center in Houston. Under a contract awarded in July 2007, Pratt and Whitney Rocketdyne Inc., of Canoga Park, Calif., will design, develop, test and evaluate the engine.

Source: NASA

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