

J-2X turbomachinery complete

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The turbomachinery assemblies for the first development J-2X engine off the production line. Credit: Pratt & Whitney Rocketdyne

(PhysOrg.com) -- NASA and Pratt & Whitney Rocketdyne have successfully completed the heart of the J-2X upper stage rocket engine -- the turbomachinery assemblies -- for the first development engine off the production line.

The engine's turbomachinery consists of two turbopumps, each part pump and part turbine. Turbines provide the power to drive the pumps. One pump pushes high-pressure liquid oxygen, or oxidizer, and the other pumps liquid hydrogen fuel through the engine and to the engine's main injector. When the two meet, the fuels combine in a controlled high-pressure explosion producing the combustion needed to propel a launch vehicle to its journey to [space](#).

"The turbopumps are extremely complicated engine components whose design requires delicate balances between many of the fields of mechanical engineering, and whose fabrication and assembly involve extremely precise construction," said Gary Genge, J-2X turbomachinery manager at NASA's Marshall Space Flight Center in Huntsville, Ala. "We're thrilled these parts are completed, and are ready to send to Stennis Space Center for assembly onto our first engine."

The J-2X engine is a highly efficient and versatile [rocket engine](#) and has the ideal thrust and performance characteristics to power the upper stage of a heavy-lift launch vehicle. Investments made in developing the J-2X engine provide the nation with a new, robust rocket engine for future human spaceflight missions to low-Earth orbit, Mars or an asteroid.

[NASA](#)'s Marshall Space Flight Center manages J-2X [engine](#) development. Pratt & Whitney Rocketdyne, Canoga Park, Calif., is the prime contractor.

Provided by JPL/NASA

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