Largest-ever solid rocket motor poised for first hot firing

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P120C
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P120C awaits first hot firing. Credit: European Space Agency

This week, the largest solid rocket motor ever built in one piece will be test fired at Europe's Spaceport in French Guiana for the first time.

This important milestone validates the booster for use on Vega-C next year and on Ariane 6 from 2020.

Fully loaded with solid fuel, the P120C rocket motor common to Europe's future launchers Vega-C and Ariane 6, will be held vertically in the test stand and ignited. Sensors will gather about 600 measures during the test.

The P120C is 13.5 m long and 3.4 m in diameter, contains 142 tonnes of solid propellant and provides a maximum thrust of 4615 kN (in vacuum) over a burn time of about 135 s.

The design builds on existing expertise and lessons learned with Vega's P80 first stage motor. P120C will replace P80 as the first stage motor of Vega-C. Two or four P120Cs will be strapped onto Ariane 6 as boosters for liftoff.

All main components of the motor such as nozzle, igniter, solid propellant, and insulated motor case have already been tested separately. This static firing will prove these technologies, materials and production techniques in combination and validate the behaviour of the assembled motor.

The test stand with the tools and equipment that will secure the P120C

for its test firing, have had to be modified or developed to accommodate this huge motor.

Recently a full-scale model of the P120C filled with inert propellant allowed engineers to verify tools, check connections and perfect procedures.

Information gathered during this static firing will allow engineers to compare their numerical models against observed reality to consolidate the P120C design.

This will guide the design of the P120C qualification motor that will be static fired at the end of the year.

Provided by European Space Agency