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The Additive Manufacturing Development Breadboard Engine (BBE) is a pressure-fed liquid oxygen/pump-fed liquid hydrogen (LOX/LH2) expander cycle engine that was built and operated by NASA at Marshall Space Flight Center's East Test Area. The breadboard engine was conceived as a technology demonstrator for the additive manufacturing technologies for an advanced upper stage prototype engine. The components tested on the breadboard engine included an ablative chamber, injector, main fuel valve, turbine bypass valve, a main oxidizer valve, a mixer and the fuel turbopump. All parts minus the ablative chamber were additively manufactured. The BBE was successfully hot fire tested seven times. Data collected from the test series will be used for follow on demonstration tests with a liquid oxygen turbopump and a regeneratively cooled chamber and nozzle.

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