

FAA William J. Hughes Technical Center

Propulsion and Fuel Systems Test Facilities, Buildings 211 and 292

The propulsion and fuel systems test facilities provide research and testing to ensure the safety of all civil aircraft propulsion, fuel, and power plant and fuel system installations.

These facilities also provide the validation of data and technical bases for improvements to civil aircraft certification and operational standards, including procedural guidance and means of demonstrated compliance to these standards. The individual laboratories include the Large-Engine Test Laboratory, Small-Engine Test Laboratory, Fuels Research Laboratory, and Wing Fuel Spillage and Jettison Laboratory.



data acquisition equipment. The CAS enables test engineers to provide combustion air to test engines over a wide range of temperatures and relative humidity. With this new capability, more realistic engine performance tests can be conducted.



Large-Engine Test Laboratory

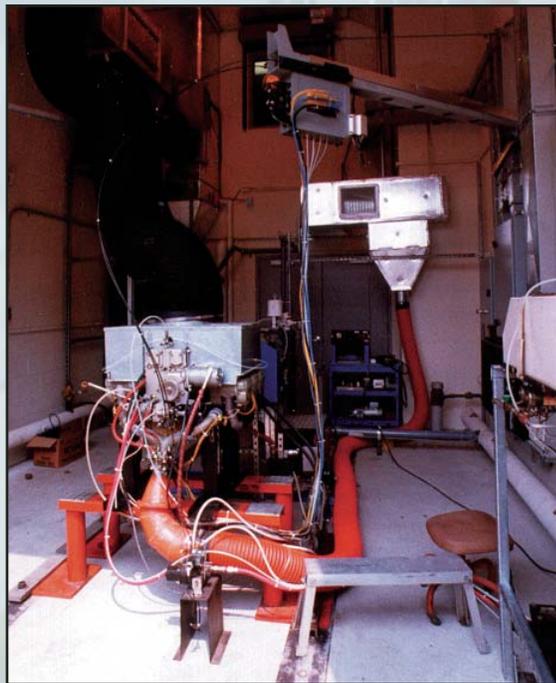
The Large-Engine Test Laboratory consists of one test cell (40 by 30 ft), a control room, and supporting test and data acquisition equipment that can be used to assess the safety and performance of large turbine engines and general aviation piston engines and related systems. The test cell has been upgraded with a new eddy-current dynamometer that can accommodate aviation piston engines up to a maximum rating of 500-shaft horsepower (hp).

The test cell is also used as the engine buildup and teardown work area. The upgrade of this test cell includes the addition of a conditioned air system (CAS) and new



Small-Engine Test Laboratory

The Small-Engine Test Laboratory is designed for full-scale testing and performance evaluation of small aircraft engines, including existing engine (turbine and piston) and future engine (diesel and rotary) designs. The building contains two test cells equipped with brake (750 hp) and eddy-current (500 hp) dynamometers, control room, data acquisition system, and associated support equipment needed to perform engine combustion analysis, exhaust emission, detonation detection, and other safety- and performance-related assessments.



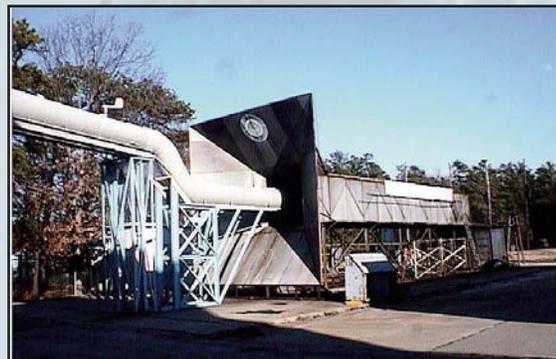
Fuels Research Laboratory

The Fuels Research Laboratory consists of two main test areas, one for fuel analysis and another for fuel component system testing. The fuel analysis area is equipped for conducting tests in accordance with the American Society for Testing and Materials (ASTM) test standards specified for aviation turbine fuels (ASTM D 1655), aviation gasoline (ASTM D 910), automotive gasoline (ASTM D 439), and other alternate fuels. The fuel component systems test area includes bench test installations to perform research and testing associated with aircraft fuel transfer and other handling systems.

The fuel component systems test area is set up to conduct tests on engine fuel systems, engine controls and accessories, and engine fire protection systems.

Wing Fuel Spillage and Jettison Laboratory

The Wing Fuel Spillage and Jettison Laboratory consists of a ram air (200 knots) wind tunnel, a wing test section, and a data acquisition control area. The laboratory is used to assess the safety and performance characteristics of fuels and fuel transfer systems under simulated high airflow flight



conditions. The laboratory has been used to evaluate postcrash effectiveness of safety fuel additives and can be used for procedures associated with the emergency jettison of aircraft fuel and other experiments involving fuel and fuel transfer system performance needs.



To find out more about the Propulsion and Fuel Systems Test Facilities, contact:

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