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Air Safety Investigator
Eastern Region

Date: March 17, 2022

Subject: NTSB investigation ERA21LA155, N262KT, experimental Stallion airplane, Ridgeland, South Carolina, March 13, 2022. September 30, 2022. Record of conversation with pilot.

Contact: Scott Martin Pilot/Owner/Builder

On March 17, 2022, Mr. Martin provided the following information via telephone:

The Stallion is an experimental amateur-built airplane, equipped with a modified Continental IO-550 engine. The airplane had been stored for about 16 years before the build was completed in 2019. Prior to the accident, the most recent flight was in January 2022.

The engine was equipped with a Simple Digital System electronic fuel injection and ignition system. The system was powered by a dedicated 12 VDC engine electrical bus, which included a backup battery. It included dual redundant electric fuel pumps and required an estimated 24 amps to operate.

The engine bus received its electrical power from the 28 VDC airframe bus, through a KGS Electronics DC-DC converter. The engine was equipped with a primary 60 amp alternator and a backup 20 amp alternator, both of which were connected to the airframe electrical bus.

The airplane was also equipped with an electric-hydraulic power pack which provides hydraulic pressure to operate the retractable landing gear. The electric motor requires about 40-42 amps at startup, and about 20-22 amps when running.

The purpose of the accident flight was to evaluate the handling qualities and evaluate a fuel leak repair. A ground run of the engine was performed about 1 hour prior to the start for the accident flight. After starting, the engine was warmed for 8-10 minutes before taxiing to the runway.

During the takeoff roll, a high voltage warning message appeared on the electronic flight instrument system. The system was configured activate the warning if the airframe electrical bus voltage exceeded 30.5 VDC. At the same time, he heard "loud static" through his headset. He elected to continue the takeoff, in part because he was not certain there was sufficient runway remaining to stop, and he also did not think the overvoltage condition on the airframe electrical bus would affect the EFI/ignition system on the engine electrical bus, as it had its own backup battery. After liftoff, the airplane climbed normally. At an altitude of 50 ft, as he attempted to raise the landing gear, the engine immediately lost all power. He moved the landing gear handle back to the down position, deployed the flaps, and performed a forced landing to an open field straight ahead. After a landing roll of about 100 yards, the airplane yawed to the right about 90 degrees. The lower forward fuselage sustained substantial damage.

After the accident, he found that the primary alternator field circuit breaker in the open position. Both batteries (one on the airframe electrical bus, the other on the engine electrical bus) retained some power. The engine electrical bus had power when activated by its independent switch. Neither of the two electric fuel pumps would operate, though they appeared to draw some current.

Mr. Martin offered that the overvoltage condition could have been caused by an overspeed of the alternator, perhaps due to the size of its pulley along with the engine operating at full rpm, or an open ground connection. He further asserted that the backup battery, on the engine electrical bus, likely did not have sufficient power to independently operate the electronic fuel injection and ignition system.

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