

Report of Findings

Date of accident: March 30 2019
Location of the accident: Palatka, FL
Aircraft registration: N81KK
Aircraft type: Flight Design CTLS
Engine type and S/N: Rotax 912ULS S/N 5649648
NTSB or TSB file number: ERA19LA141
Date of Report: April 4th 2019
File number: 2019-012

Original Accident Location:

- Palatka, Florida, U.S.

Preliminary engine inspection

Inspection carried out at: Florida Air Recovery, Jacksonville, FL

Date of inspection: April 4th 2019

Persons in attendance

Oversight by NTSB/FAA personnel:

Mr. Daniel Boggs – NTSB Air Safety Investigator, Ashburn, VA

Mr. Donald Andrews - FAA Aviation Safety Inspector, Orlando, FL.

ENGINE

- Rotax Engine Model Number: Rotax 912ULS
- Rotax engine serial number: 5649648

OVERVIEW:

NTSB Preliminary:

On March 30, 2019, about 1700 eastern daylight time, a Flight Design CTLS airplane, N81KK, was substantially damaged following a total loss of engine power and forced landing at Palatka, Florida. The commercial pilot and one passenger sustained serious injuries. The airplane was substantially damaged. The flight was operated by the pilot as a Title 14 Code of Federal Regulations Part 91 personal flight. Day, visual meteorological conditions prevailed near the accident site, and no flight plan was filed. The flight originated at Hilton Head Airport (HDX), Hilton Head, South Carolina about 1500 and was destined for Palatka Municipal Airport (28J), Palatka, Florida.

According to the pilot, the engine abruptly lost power while north of 28J. Unable to restart the engine, he set up for a forced landing in a clear area near a landfill. He pulled the handle for the ballistic parachute system. The rocket fired; however, the parachute remained in its container. The airplane landed in a nose-low attitude and the occupants were met by first responders.

Structural damage was found on the lower and aft fuselage and at the wingtips. The wreckage was retained for further examination.

Initial condition of aircraft:

The aircraft sustained severe impact damage to its landing gear, propeller and engine cowling. The aircraft's wings were previously removed and the fuselage was placed on the back of a flat deck for examination.



Detailed Engine Inspection

Fuel System including carb inspection and fuel lines

- The carburetor float bowls were removed and examined for fuel quantity, fuel quality, and contamination. Both float bowls were found absent of any fuel or contamination.
- The carburetor main jets were clear of any obstruction
- The carburetor float appeared to be in good overall condition.



- The fuel lines were in good overall condition and protected by a fire sleeve. No anomalies were found with the fuel lines or fuel system.



Fuel supply including fuel pump

- Fuel Pump P/N 893 115, S/N 17.0622 was the correct type and in good overall condition. No anomalies were found with the fuel pump.



- The gascolator bowl was drained into a clear container. A minimal amount of fuel was contained inside the gascolator. The fuel appeared to be Av-Gas 100LL based on the color and odor. The fuel appeared to be free of any contamination.



Lubrication system

- The lubrication system appeared to be in good overall condition and intact. The oil level was checked and found to be within operational limits. No anomalies seen with the oil lubrication system.



Cooling system

- The cooling system was examined for condition and anomalies. No anomalies were found with the cooling system and it appeared to be in good overall condition with no breaches. Coolant was found contained within the coolant expansion tank. An aftermarket coolant thermostat was found installed within the coolant system.



Gearbox

The propeller shaft was rotated to see if any binding or unusual noises could be felt or heard coming from the reduction gearbox. No anomalies with the reduction gearbox were noted.

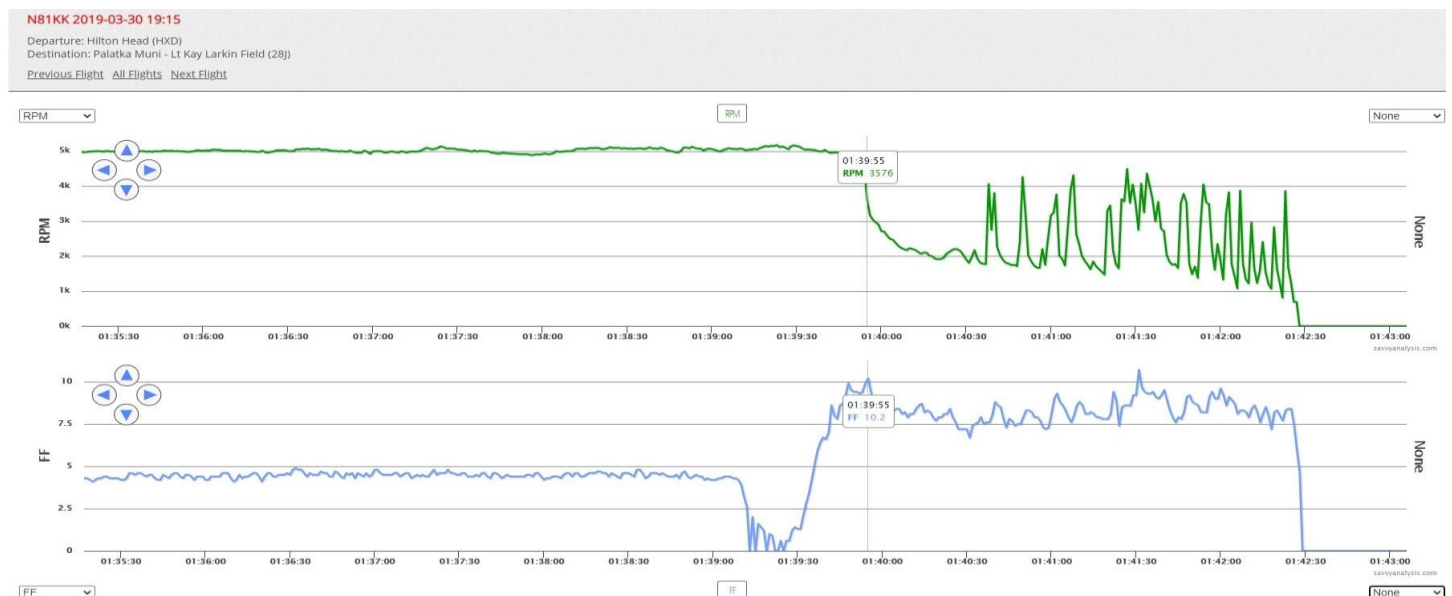


Engine test run

It was determined that the aircraft and engine was in good enough condition to perform a test run. The fuel pump inlet line was disconnected at the gascolator and placed into a fuel container full of fuel. The aircraft's battery was charged with the use of a battery charger. The starter was engaged and the engine rotated and started within a few rotations. The engine RPM was manipulated by the throttle levers on the carburetors to various RPM settings. The engine ran normally and as expected for several minutes. No anomalies were observed or noted during the engine test run.

Engine data:

The engine parameter data contained within the Dynon flight instrument was extracted and analyzed. The Dynon engine data showed fuel flow dropped to 0 GPH at the **1:39:13** time stamp. At time stamp **1:39:56**, fuel flow spiked to 10.2 GPH indicating that air was being introduced into the fuel system resulting in a substantial increase in fuel flow. Normal fuel flow on the Rotax 912ULS engine is approximately 4.8 GPH at 5000 RPM. As air is introduced into the fuel system, it speeds up the impeller on the fuel flow transducer, resulting in a spike/increase of fuel flow indication.



At time stamp **1:39:24** Fuel pressure began to drop to zero. Since the fuel pressure dropped after the fuel flow, this was an indication the aircrafts fuel pump was operating normally and that the fuel system was absent of fuel.



At time stamp **1:39:52** engine RPM began to drop and fluctuate rapidly (39 seconds after fuel flow dropped to 0 GPH and 28 seconds after fuel pressure dropped to 0 PSI)



Conclusion:

Based off the engine examination, engine test run and analysis of the Dynon data, it appears the aircraft ran out of fuel resulting in the engine to lose power.