



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Eastern Region

AIRFRAME AND ENGINE EXAMINATION

CASE NUMBER: ERA21FA010

AIRCRAFT: Czech Aircraft Works, Sport Cruiser, N251SC

EXAMINATION PARTICIPANTS:

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SUMMARY

Examination of the recovered airframe and engine was conducted on 3/4/2022 at the Atlanta Air Salvage, Griffin, GA. No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engine.

DETAILS OF THE INVESTIGATION

The airplane departed from the McKinney National Airport (TKI) enroute to Ripley Airport Mississippi (25M). After arriving at 25M, the pilot refueled the airplane before departing on his trip home. After departure the pilot was at an altitude of 3,500 ft. About 45 nautical miles from the airport the airplane collided into a heavily wooded area.

Airframe Examination

Examination of the airframe revealed the airplane came to rest inverted and crushed. All flight control surfaces were located at the wreckage site. The on-scene examination revealed flight control continuity was established throughout the airframe.

Engine Examination

Examination of the engine revealed the engine was still attached to the airframe and the engine controls were crushed. Engine control positions were unreliable due to impact damage.

Initial condition of Engine as presented prior to detailed inspection

- Engine substantially damaged from impact
- Gearbox broken and internal components exposed
- Engine not attached to aircraft (removed)
- Aircraft is substantially damaged from post impact
- Several indications show the engine was not running at the time of impact (tooth stamp on crank case & condition of the propeller blades)
- It appears the gascolator has rust and corrosion. The gascolator bowl was not attached to its base and it was open to the elements.

Detailed Engine Inspection

Spark Plugs & Spark plug Caps

- All plugs were NGK R DCPR8E with electrode gap of .032
- No anomalies noted with spark plugs

Ignition System

- Physically examined but not tested. No anomalies noted

Fuel System including carb inspection and fuel lines

- Removed 1/3 float bowl. A small amount of water was found contained inside the float bowl (Tested positive with water finding paste) the floats were weighed and were 6 grams. Main jet was clear of obstruction and was a 155. No other anomalies were seen with the carburetor.
- Removed 2/4 float bowl. No fuel or any other liquid was contained inside float bowl (Dry). The floats weighed 5.9 grams and the main jet was clear of obstruction and was a 155. No other anomalies were seen with the carburetor.
Float bowl gasket was not seated correctly and was protruding inside the float bowl.
- The fuel lines were not routed as per the Czech sport fuel system diagram, Rotax fuel system installation instructions, OR the in accordance with the Safety Alert / Safety Directive SA-SC-012 that was released on 2019-11-14. ***There was no bypass routed around the aftermarket electric fuel pump that was installed.***

Fuel supply including fuel pump

- Mechanical fuel pump suffered from post impact damage and could not be tested. The fuel pump was disassembled and inspected. No fuel was found contained inside and no anomalies were seen.
- The electric fuel pump was not the original type or style of fuel pump that comes with the aircraft from the manufacturer. The fuel pump was an aftermarket TI Automotive electric fuel pump. The fuel pump was connected to 12v power, and it did not operate or make any noise. When sucking through the outlet of the fuel pump, air could not be drawn though indicating the fuel pump was not a free-flowing fuel pump.

Lubrication system

- Oil was seen contained within the engine. No evidence of oil starvation or a lubrication problem.
- Oil cooler was substantially damaged, and the oil system was breached.
- Oil tank was damaged from impact and breached. No oil was contained within oil tank.

Cylinder and cylinder head

- All cylinder heads removed and examined. No anomalies were seen with the cylinder heads or its components (valves, pushrods, rocker arms etc.)
- The engine crankshaft was rotated, and the cylinders inspected. No anomalies seen with the cylinders and good cross hatching was seen

Cooling system

- Coolant system was breached due to post impact damage. Minimal coolant was found contained within the cylinder heads. No anomalies were seen with the coolant system.

Air Filter system

- No present for examination.

Exhaust system

The exhaust system was sustainably damaged from the post impact fire. No anomalies were seen with the exhaust system.

Gearbox

- The gearbox was substantially damaged. A large portion of the gearbox was not present for the examination. The gearbox had the lower portion of the case still attached to the crankcase.

Crankcase and crankshaft

The crankshaft was rotated, and continuity was established. No anomalies were seen with the crankshaft. The crankcase was externally examined. No anomalies were seen with the crankcase.