



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Central Region

October 24, 2017

AIRFRAME AND ENGINE EXAMINATION

CEN17LA357

(4 pages)

A. EXAMINATION PARTICIPANTS:

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B. SUMMARY

Examination of the recovered airframe and engine was conducted on October 24, 2017, at the facilities of Dawson Aircraft, Clinton, Arkansas. No evidence of preimpact mechanical malfunction was noted during the examination of the recovered airframe and engine.

C. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

The left wing, mostly separated right wing, both elevators, and the right horizontal stabilizer were removed from the airplane during the recovery. The ailerons remained attached to the wings. The vertical stabilizer and rudder were attached to the fuselage. Rudder control continuity was established from the cockpit to the control surface. The elevator control continuity was established from the cockpit to the elevator attach points. The left-wing aileron cables were cut during recovery; however, control continuity was established from the wing root to the control aileron. The right-wing aileron cables at the wing root were manipulated and the aileron moved in one direction only. Upon further investigation, it was found that one of the ends of the aileron outboard bellcrank had fractured and the cable remained attached to the fractured end of the bellcrank.

Both wings had been stored outside at Dawson Aviation. The right wing was stored upside down and the left wing was stored right side up. When the fuel cap on the right wing was opened a small amount of residual fuel leaked out from the wing. When the left-wing fuel cap was opened a small amount of water leaked out of the fuel tank. Both fuel caps were removed, inspected, and found to have cracks in the main O-ring seal. The left fuel cap was tested in place, by applying air pressure to the fuel out line and plugging the vent system and tip tank fuel inlet. A soap and water solution placed around the cap bubbled up indicating a leak. Air could be felt escaping from around the fuel cap outer seal and the center seal. The right wing was not tested due to impact damage.

2.0 Engine Examination

Continental Motors
IO-550-B-RA
s/n 285513-R

The engine had been converted from a IO-520 per STC SE10746SC

The engine was not damaged during the accident sequence.

Performed an electronic boroscope inspection. All piston domes, cylinder walls, and valve faces exhibited normal wear and combustion deposits.

The installed propeller was damaged during the accident. The extent of the damage precluded using the accident propeller during the engine run. The propeller was removed, and a two-bladed propeller was installed on the airplane.

Removed top plugs and inspected in accordance with Champion Check-A-Plug chart. All plugs appeared to be normal in wear and color. The plugs were then reinstalled in the engine. The airframe was secured on a flatbed trailer. An alternate fuel system was rigged to the left fuel wing fuel intake line at the fuselage. (The left wing had been removed) The fuel line going into the JPI fuel flow transducer was disconnected, power was applied to the airplane and the fuel system boost pump was turned on until positive fuel flow at the disconnected line was verified. The line was then reconnected. The engine started on the first attempt and was allowed to idle between 600 – 700 rpm to confirm oil pressure and fuel flow. The rpm was increased to 1,000 rpm and the engine was allowed to stabilize. The engine power was then increased to 1,500 rpm and a magneto check was performed. The rpm drop for each magneto during the check was 60 to 80 rpm. The engine rpm was not checked above 1,500 rpm due to the security of the fuselage on the trailer.

The above process was repeated with an alternate fuel supply rigged to the right-wing fuel inlet line. The engine run results were the same.

With the engine running 1,500 rpm, the fuel selector was switched to the off position. The engine ran for about 25 seconds prior to it shutting down.

Examination of the engine revealed the engine started and ran smoothly as tested up to 1,500 rpm.

3.0 Propeller Examination

Hartzell
Model PHC-C3YF-1RF
s/n QG1361B

The propeller remained attached to the crankshaft propeller flange. The spinner and all three propeller blades remained in place and were loose in the propeller hub. No chordwise scratches

were visible on any of the blades. Leading edge blade tip polishing was visible on all of the blades. The blades were marked arbitrarily for descriptive purposes.

Blade A – Exhibits a smooth rearward bend beginning about 12 inches outboard from the blade root. A small amount of paint transfer is visible about 8 inches inboard from the blade tip.

Blade B - Exhibits a smooth rearward bend beginning about 12 inches outboard from the blade root. A small amount of paint transfer is visible about 6 inches inboard from the blade tip.

Blade C - Exhibits a smooth rearward bend beginning about 14 inches outboard from the blade root. A small amount of paint transfer is visible about 9 inches inboard from the blade tip.

Submitted by: Investigator