



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Central Region

October 3, 2015

AIRFRAME AND ENGINE EXAMINATION

CEN16FA001

(3 pages)

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B. SUMMARY

Examination of the recovered airframe and engine was conducted onscene on October 3, 2015. 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

Upon arrival of the investigative team, the aircraft battery power was still on. The wingtip lights were illuminated. The cockpit switches for the fuel boost pump, strobes and instrument lights were in the ON position. The magneto switch was in the BOTH position. The carburetor heat knob was broken off but the control cable appeared to be in the off (cold) position. The mixture control was full rich and the throttle was at idle. The fuel selector was OFF position.

Examination of the airframe revealed both sides of the aft fuselage were crushed inward, with the left side crushing being more extensive. The top of the cockpit area was crushed downward to the top of the seats and the remainder of the cockpit area was not compromised. The top of the engine cowling was flattened onto the top of the engine. All four seats were intact. The seats were equipped with seat belt. Shoulder harnesses were not installed. The airplane was not equipped with an ELT.

The right wing of the airplane remained attached to the fuselage. The outboard section of the wing was bent downward. The leading edge of the wing was crushed rearward at a point which aligned with the inboard section of the aileron. The aileron and flap remained attached to the wing. The right wing fuel tank was intact and the fuel cap was secured. Approximately 4 gallons of clean, blue fuel were drained from the right wing fuel tank. There was fuel slowly dripping from the right fuel tank fuel cap before the airplane was righted.

The left wing remained attached to the fuselage. The outboard section of the left wing was separated and remained attached to the inboard section by the aileron hinge points. The aileron and flap remained attached to the wing. The left wing fuel tank was intact and the cap was secured. Approximately 16 ounces of clean, blue fuel were drained from the left fuel tank. There was no evidence of fuel leaking from the fuel tank.

The horizontal stabilator remained attached to the empennage and it sustained little damage. The rudder and vertical stabilizer remained attached to the empennage. The top of both the rudder and vertical stabilizer were crushed. The pitch trim drum displayed 9 threads upper extension of the inner shaft. This position was consistent with a setting of about 50% or 6 degrees of the available 12 degrees nose up trim.

Continuity of all of the flight control cables was established from each flight control surface to their respective cockpit controls. Both the left and right flaps were in place and the flaps were extended about 40 degrees. All three landing gears remained attached.

2.0 Engine Examination

The engine was a Lycoming O-320-E2A, s/n L-19195-27A, that had been modified by STC SA413CH (airframe) and SE367CH (engine) to increase the horsepower to 160. The tachometer time at the time of the accident was 49.5.

After switching off the fuel boost pump, the gascolator bowl was removed. The gascolator bowl was about 3/4 full of clean blue fuel, no debris or water was noted. A test of the fuel with KolorKut revealing paste was negative for water. The gascolator screen was free of debris, as was the boost pump filter. The carburetor was removed from its engine attachment and disassembled. Metal floats and a one piece venturi were installed. No fuel was present in the carburetor bowl. The carburetor fuel inlet screen was examined and found to be free of any debris.

The engine was rotated by hand using the propeller. Thumb compression, suction, and valve train continuity was confirmed to all cylinders. Accessory gear rotation was verified and both magnetos sparked all leads when the engine was manually rotated. All spark plugs, Champion (REM40E) were removed and showed a light grey color. All of the spark plugs were mid to late service life per Champion AV-27 chart. Damage to the starter housing from impact with the ring gear was consistent with slow rotation/no power at the time of impact.

Propeller

The propeller was a Sensenich Model M74DM-0-58, SN K12004. The blades were marked A and B for identification. The propeller was secure to the engine and displayed a slight bend of about 10 degrees to the A blade along the outboard 1/2 span of the blade. There was no rotational damage to the blades.

The propeller remained attached to the engine. One propeller blade was straight. The other blade had a slight bend near the tip of the blade.

Submitted by: Pamela S Sullivan