



**NATIONAL TRANSPORTATION SAFETY BOARD**

**Office of Aviation Safety**

**Central Region**

**October 17, 2016**

**AIRFRAME AND ENGINE EXAMINATION**

**CEN17FA016**

**(4 pages)**

## **A. EXAMINATION PARTICIPANTS:**

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## **B. SUMMARY**

Examination of the recovered airframe and engine was conducted on October 17, 2016, in a hangar at the Warren County Airport, Lebanon, Ohio. 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 cockpit was destroyed by impact and a postimpact fire. The forward control stick and rudder pedals were identified in the main wreckage. The aft seat control stick lower fitting was identified and the control stick was not inserted into the fitting. The aft seat control stick was in what was the cockpit area.

The empennage sustained impact damage and remained attached to the fuselage/cockpit area by control cables. The rudder remained attached to the vertical stabilizer at the upper hinge point. The right rudder cable remained attached at the rudder surface and structure at the left rudder cable was separated from the rudder. Cable continuity was established to the cockpit area. The left elevator remained attached to the horizontal stabilizer and both sustained thermal and impact damage. The right elevator and horizontal stabilizer sustained impact damage. The right elevator surface was in the trees near the accident site. The elevator push/pull tube was connected at the elevator and was separated due to thermal damage in the aft fuselage area.

Both wings remained attached to each other by the carry thru spar which was bent rearward. The wings sustained impact and thermal damage and were separated from the remainder of the airplane.

The left wing sustained thermal damage with the exception of the fiberglass wingtip and a leading edge section of the wing just inboard of the wingtip. Both these pieces were found near the main wreckage. The leading edge of the wing was crushed rearward. The inboard section of the wing surrounding the fuel tank area was destroyed by thermal damage. The aileron and flap remained attached to the wing. The aileron push/pull tube remained attached to the aileron. The tube was separated near the inboard section of the wing that was destroyed by fire.

The inboard section of the right wing was destroyed by the fire. The outboard section of the wing sustained impact damage. The outboard section of the flap was attached to the wing with the inboard section having been destroyed by fire. The aileron remained attached to the wing at the inboard hinge. The outboard aileron hinge area of the wing was separated. The leading edge of the wing was crushed rearward. The outboard 3 ft of the wing, including the wingtip was separated into several pieces. The bottom leading edge portion of the wingtip was not located. The leading edge of the forward spar contained impact marks indicative of a cable strike near the area where the structure was separated. The outboard section of the wing just inboard of the wingtip that was found between the zipline and the main wreckage contained an impact area that was crushed outboard and rearward. This section contained an impact fold that was about ½ inch in diameter.

## **2.0 Engine Examination**

Examination of the engine revealed no anomalies that would have prevented normal operation.

Lycoming O-320 s/n L-38136-27A 160hp

The engine sustained impact and thermal damage. It was found at the main wreckage site. The engine was completely separated from the firewall which was destroyed by impact and thermal damage.

Both magnetos were melted and could not be tested. The right magneto remained attached to the engine. The left magneto was separated from the engine.

The propeller hub remained attached to the engine. Both wooden blades were shattered into numerous pieces and were scattered around the main wreckage.

The oil sump sustained impact damage and there was a large hole in the sump. There was no oil present. The accessory housing was subjected to impact and thermal damage. The accessory housing was removed. The accessory gears drive gears were intact and were subjected to heat. The melted accessory housing and the propeller hub were removed, and the crankshaft was rotated via the propeller hub. Valve, piston, and accessory gear continuity was verified. Thumb compression was achieved on all four cylinders.

The oil screen was removed and was clean of debris.

The bottom of the carburetor was separated during the impact sequence and was found near the engine. The carburetor float was not located.

Two bottom spark plugs were separated from the engine. The top plugs were removed. The #1 and #3 top plugs were moist from oil. The #2 and #4 plugs were dry. The plugs exhibited normal wear signatures.

Submitted by: Pamela S Sullivan