



The National Transportation Safety Board

Office of Aviation Safety
Central Region
Memorandum for the Record
Airframe Examination
Findings
CEN19FA120
Lake Mississippi
April 13 2019

General

Examination of the main wreckage showed that the airplane impacted the ground at a high speed, near vertical condition. The airplane's engine and propeller were buried about 4-feet into the ground. There was no post-impact fire. The inboard sections of the left and right wings were attached to the fuselage at their respective roots and exhibited aft and upward deformations. Outboard sections of the left and right wings, and portions of the empennage, were not present with the main wreckage. A search of the wooded area adjacent to the main wreckage was conducted. The distance of the farthest part from the main wreckage (left aileron) was located about 1,500 ft from the main wreckage. Outboard sections of both the left and right wings were located about 1,000 ft from the main wreckage. The right and left horizontal stabilizers were located about 900 ft from the main wreckage. The debris path and separated sections of the wings and empennage were consistent with an in-flight breakup. See Figure 1.

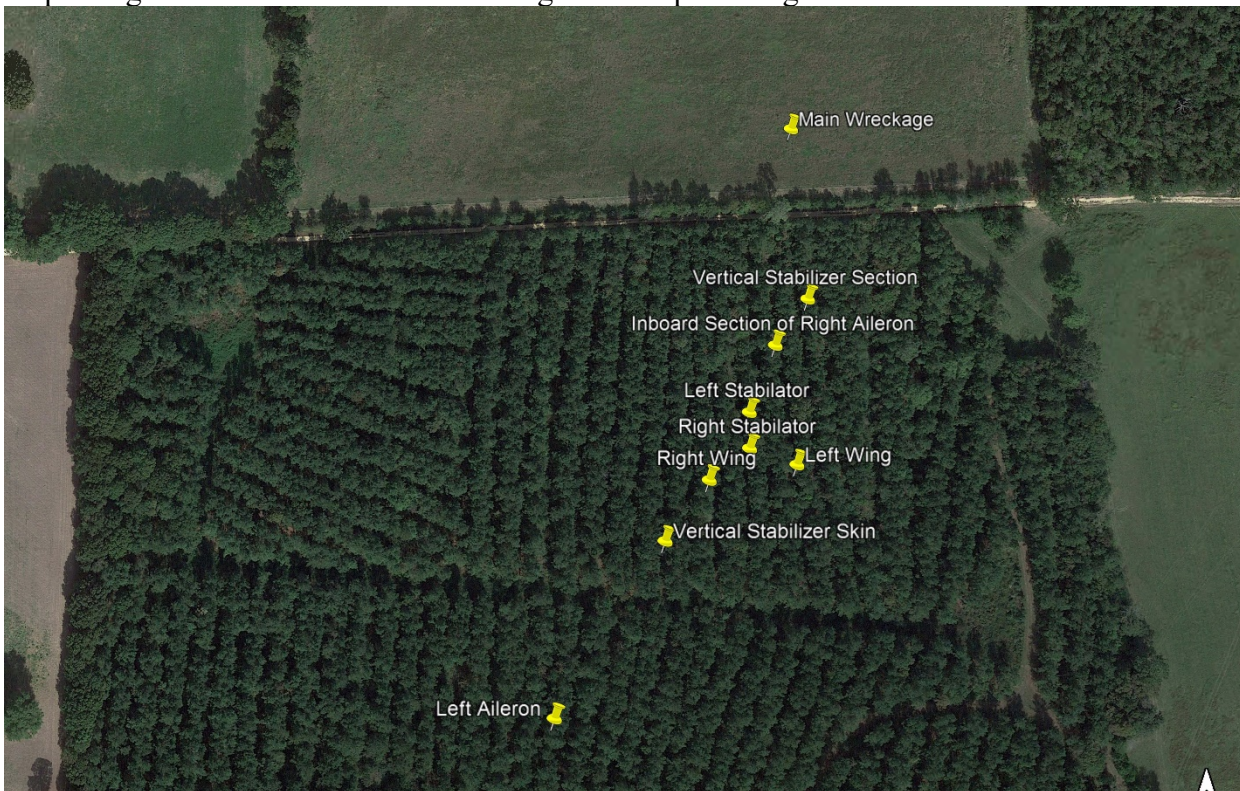


Figure 1. Wreckage Distribution

Fuselage/Cabin/Instrument Panel

The fuselage was crushed and mostly fragmented. The baggage door was separated from its hinge and was observed in the “Locked” position. The cabin door was separated from its upper hinge and the door was separated into two sections. The door’s upper latch was in the latched position. The windshields and windows were fragmented. The flap control lever was deformed and was noted in the “Flaps up/0°” position. The flap torque tube was deformed, and its return spring was separated from its attachment point on the torque tube.

The instrument panel was attached to a separated section of fuselage that contained the firewall. It was mostly fragmented and deformed. The tachometer was impact damaged and its needle was static at about 2300 RPM. The recording numbers of the tachometer were destroyed. There was no Hobbs meter observed. The T-bar was fractured in several places. The aileron control cables remained attached to the T-bar chain, but the chain was fractured and separated from the assembly. The copilots control wheel remained attached to its shaft and its right horn was fractured. The pilot’s control wheel remained attached to a fractured section of shaft, and both control wheel horns were fractured. The stabilator control cables remained attached to the T-bar assembly. The rudder pedal assembly was impact damaged, but the rudder control cables remained attached to their respective attaching points.

The supporting structure of the fuel selector was destroyed. The fuel selector was observed in the “Left” fuel tank position and was confirmed during field test with low pressure air. Field test of the selector valve revealed the inner components of the valve were fragmented.

The following was observed on the instrument panel

- Primer was stowed
- Battery master off position
- Electric fuel pump was in the on position
- Nav and instrument lights on
- Landing light on
- Rotating beacon on
- Magneto switch Both
- Throttle control in the aft position and control was separated from the panel
- Mixture control was in the forward “rich” position and the control was separated from the panel
- Stall light bulb was separated from the panel and was not located

The nose landing gear was separated from the fragmented engine mount and the engine cowlings were fragmented. The cabin heat box was crushed, and its door was observed in the “Off” position. The defrost and heat controls were in the “Off” position. Disassembly of the vacuum driven attitude indicator and directional gyros revealed a substantial amount of rotation scoring to their rotors and housings.

The rear seat was fragmented and separated from its attaching points. The rear seat belts remained attached to their attaching points and were observed unlatched. The pilot’s seat was deformed inboard and its seat frame was fractured. The seat was separated from its seat tracks which were separated from the fragmented fuselage. The seat belts remained attached to the fuselage and were observed latched. The copilot’s seat was deformed and partially separated from its seat tracks. The seat belts remained attached to the fuselage and was observed latched. Field test of the pilot and copilot seat belts were determined to be functional during field test. There were no shoulder harnesses installed in the aircraft.

Left Wing

The left wing was attached to the fuselage at its root and exhibited aft and upward deformation. About 66-inches of the outboard section of the wing was separated from the remainder of the wing assembly and was

located about 1,000 ft from the main wreckage. Compression buckling was observed to the upper wing skin. The fractured areas of the outboard wing section exhibited upward deformation, and the fractured surfaces were consistent with overload separation. The leading-edge was crushed aft and was fragmented. The fuel tank was breeched from impact forces with pillowing observed to its upper skin. The fuel tank pick-up screen was clear of debris and the fuel cap was attached to its receptacle. The main landing gear displayed impact damages but remained attached to the wing. The flap was in the “UP/0°” position and partially separated from the wing. Deformation consistent with the wing was observed to the flap.

The right aileron was separated from its hinges and upward deformation. The aileron balance weight remained attached to a small section of aileron that was attached to the outboard aileron hinge. The aileron bellcrank was deformed and pulled inboard but remained attached to its supporting structure. There was no evidence of repeated contact observed to the aileron travel limit stops. The aileron control rod was fractured from the bellcrank and its aileron attaching bracket was pulled from the aileron. The aileron control rod was not observed within the recovered wreckage. The Aileron cables remained attached to the bellcrank and were continuous to their respective attaching points. Control continuity was established except where overload separations exist.

Right Wing

The right wing was attached to the fuselage at its root and exhibited aft and upward deformation. About 68-inches of the outboard section of the wing and was separated from the remainder of the wing assembly and located about 1,000 ft from the main wreckage. The separated section of wing displayed compression buckling to the upper wing skin. The fractured areas of the outboard wing section exhibited upward deformation, and the fractured surfaces were consistent with overload separation. The inboard wing section was crushed with torsional twisting observed to its main spar. The fuel tank was breeched from impact forces with pillowing observed to its upper skin. The fuel cap remained attached to its receptacle, and the tank’s pick-up screen was clear of debris. The main landing gear exhibited impact damage but remained attached to the wing.

The flap was attached to its inboard hinges and its outboard hinge was pulled from the flap. The flap was observed in the “UP/0°” position and was deformed upward. The aileron remained attached at its outboard hinge. The outboard about 24” of aileron was deformed upward, and the aileron was separated into two sections. The aileron balance weight remained attached to the aileron. The aileron control rod remained attached to the aileron but was fractured from the bellcrank. The aileron bellcrank was deformed and pulled inboard from its attaching points and was pulled through the lower wing skin. No evidence of repeated contact was observed to the aileron’s travel limit stops. The aileron control cables remained attached to bellcrank and were continuous to their respective attaching points. Aileron control continuity was established except where overload separations exist.

Empennage

The vertical stabilizer was fragmented and separated from its forward attaching point. It was pulled from its rear spar which remained attached to its supporting structure but was displaced aft. Some of the vertical stabilizer’s skin was not located within the recovered wreckage. The rudder remained attached at its lower attach point and was pulled from its upper attaching point. The rudder skin was fragmented, and the lower attached skin was displaced aft. The rudder balance weight was separated from the rudder and was not located within the recovered wreckage. The rudder control cables remained attached to their respective attaching points and were traced through recovery separations to the rudder pedal assembly. No evidence of repeated contact was observed to the rudder travel limit stops. Control continuity was established except where recovery separations exist.

The stabilator was separated into two sections but its center attachment point section of spar remained attached to its hinges. The separated sections of stabilator exhibited upward deformation at the fractured areas. The fractured surfaces were consistent with overload separations. The left stabilator exhibited “U” shaped

deformation with skin separations and buckling observed to its upper skin. About 18” of inboard leading-edge area of the stabilator was deformed downward. The right stabilator section exhibited buckling to its upper skin. The stabilator trim tab remained attached to its attaching points and was separated into two sections with deformation consistent with the stabilator. The stabilator trim control rod remained attached to the trim barrel and a section of trim tab. The trim barrel exposed about 4 threads of jackscrew which was consistent with a neutral stabilator trim setting. The stabilator travel limit stops displayed no evidence of repeated contact, and its balance weight remained attached to the center section of stabilator. The stabilator control cabled remained attached to their respective attaching points and were traces through recovery separations to the T-bar assembly. Control continuity was established except where recovery and overload separations exist.

The rudder and stabilator control cables were cut in the tail-cone area of the fuselage to facilitate recovery efforts.

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