



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Central Region

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AIRFRAME AND ENGINE EXAMINATION

CEN16FA111

(4 pages)

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B. SUMMARY

Examination of the airframe was conducted on February 29, 2016, at the accident site. No evidence of preimpact mechanical malfunction was noted during the examination of the airframe. A preliminary examination of the engine was conducted at the accident site. The engine was shipped to Continental Motors for further examination.

C. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

The main wreckage site consisted of the entire airplane with minor amounts of airplane debris scattered in the immediate area. The firewall was separated from the instrument panel with the exception of a few wires and cables that remained connecting the two. The cabin roof was present, but the pillars had detached from the firewall and windscreen, and the doors were no longer in place. The aft portion of the roof was damaged up to the ceiling window located over the baggage compartment. Both cabin doors were separated from the fuselage and found near the wreckage.

Although it sustained impact damage, the empennage was relatively intact. The elevator remained attached to the horizontal stabilizer which remained attached to the empennage. The rudder remained attached vertical stabilizer which remained attached to the empennage. A 6 to 8 inch deep ground scar was located under the tail tie down and rudder. The bottom of the rudder was crushed upward. Both elevator and rudder control continuity was verified. The elevator trim motor was positioned between the neutral and full pitch down positions, although closer to the neutral position.

The spar cover, wing spar, and wing were angled downward to the front and the floor under the cabin seats exhibited impact damage. There was a ground impact scar correlating to the leading edge of both wings.

The entire leading edge of the left wing was crushed from ground impact. A 45-degree tear was present mid-span in the top skin of the wing. The left aileron sustained impact damage and it remained attached to the wing by its inboard hinge. The position of the roll trim motor was between neutral and full left trim. The left flap remained attached to the wing and was in the up position.

The leading edge of the right wing was crushed aft. The outboard section of the upper wing skin was mostly separated from the torque box structure and spar damage was evident. The right aileron and flap both exhibited impact damage; however, they remained attached to the wing. The flap was in the up position.

The right hand aileron cable was separated about 2 feet away from the cross-over turnbuckle. The separated ends of the cable showed signatures consistent with an overload separation. Aileron control continuity for the rest of the cable was verified. The flap actuator was extended about 4 inches which correlates to a flap “up” position.

Both wing fuel tanks were compromised and there was no fuel present in the tanks. First responders reported there was a strong odor of fuel near the wreckage.

All four of the seats remained attached to their respective seat tracks and floor mounts. Both the left rear seat and the right front seat showed deformation to the left. All of the seat belt inertial reels functioned with the exception of the left front seat. The left front seatbelt could be pulled out, but due to damage it would not retract.

The airplane was equipped with a Cirrus Airframe Parachute System (CAPS). The CAPS activation handle was in the activation handle holder. The activation handle holder mounting bracket was bent downward and aft with an s-shaped bend. The rocket motor was expended and it was found on the ground near the airplane. The partially packed parachute bag was on the ground near the wreckage. The harnesses, risers, and a portion of the suspension lines had deployed. The three ring release mechanism remained loosely interlocked. The beak-away cover for the parachute enclosure was located on the ground near the rudder, indicating that the system was deployed from the ground impact.

2.0 Engine Examination

A preliminary external examination of the engine was conducted at the accident site. The engine remained attached to the engine mounts which remained attached to the firewall. The forward portion of the engine was buried at roughly a 25-degree angle with only the top of the propeller spinner above the ground. The firewall had impacted the rear of the engine during the impact sequence with some of the engine accessories making an imprint on the firewall.

All of the cylinders which displayed varying degrees of impact damage remained attached to the crankcase. The crankcase sustained impact damage, but was intact. The oil cooler remained attached to the engine. The oil filter and filter adapter were separated from the engine.

Both magnetos were separated from the engine. Both magneto impulse coupling engaged when the magneto drives were turned by hand. The ignition harness sustained impact damage. The top spark plugs were in place and undamaged. The bottom spark plugs were not observed.

The fuel pump sustained impact damage. The fuel line going to the pump inlet was secured at both the pump and at the fuel bowl. The fuel line was removed from the fuel bowl and no fuel was present in the line; however, there was fuel present in the fuel bowl. The throttle and fuel metering assembly remained attached to the engine. The throttle control arm was secured to the shaft and the throttle cable rod end was secure to the throttle arm. The throttle position was at idle. The fuel manifold valve was intact and it remained attached to the engine. All of the fuel nozzles were intact.

The exhaust system sustained impact damage with the exhaust risers bent and both of the exhaust outflow pipes were flattened. The induction system sustained impact damage.

The propeller remained attached to the propeller flange. Both propeller blades were intact and remained within the propeller hub. One blade displayed forward bending and the other propeller blade was bent aft.

The engine was shipped to Continental Motors for a full teardown.

Submitted by : Pamela Sullivan, NTSB IIC