

NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SUMMARY OF ACCIDENT SITE AND AIRCRAFT EXAMINATIONS

-- CEN16FA169 --

A. ACCIDENT

Location: Carrollton, Ohio
Date: April 24, 2016
Time: 1815 eastern daylight time
Aircraft: Cessna 182L (s/n 18259007), N42411

B. PARTICIPANTS

Timothy Sorensen
Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Steven Steele
Aviation Safety Inspector
Federal Aviation Administration
North Olmsted, Ohio

Michael Rutherford
Principal Operations Inspector
Federal Aviation Administration
North Olmstead, Ohio

Henry Soderlund
Air Safety Investigator
Textron Aviation Inc.
Wichita, Kansas

C. ACCIDENT SUMMARY

On April 24, 2016, about 1815 eastern daylight time, a Cessna 182L airplane, N42411, was substantially damaged during an in-flight collision with trees and terrain near Carrollton, Ohio. The pilot was fatally injured. The aircraft was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Day visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The flight originated from the Carroll County – Tolson Airport (TSO), Carrollton, Ohio, about 1800. The intended destination was the Salem Airpark (38D), Salem, Ohio.

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D. GENERAL DESCRIPTION

Airframe

The Cessna 182L airplane is a single-engine, high-wing, with a fixed tricycle landing gear configuration. The airplane was configured with four seats and utilized a standard flight control arrangement. The individual flight control surfaces were directly actuated by control cables to the cockpit controls.

Engine Assembly

The airplane was powered by 230-horsepower Continental Motors O-470-R engine. It was a six-cylinder, normally aspirated, reciprocating engine. Thrust was provided by a two-blade McCauley 2A34C66-NP, constant speed (variable pitch) propeller assembly. The engine was controlled through direct linkages between the cockpit engine controls, and the engine carburetor and propeller governor.

E. DETAILS OF AIRCRAFT EXAMINATIONS

The airframe and engine examinations were conducted at the accident site on April 30, 2016. The NTSB investigator-in-charge was assisted by representatives of the FAA and the airframe manufacturer. The airplane was released by the NTSB investigator-in-charge following the examinations.

F. DESCRIPTION OF ACCIDENT SITE

The accident site was located in a wooded ravine about 5.5 miles northeast of Carroll County – Tolson Airport (KTSO). GPS coordinates were 40 degrees 36.619 minutes north latitude, 080 degrees 58.564 minutes west longitude. The accident site elevation was approximately 1,126 feet.

The airplane came to rest upright on an approximate 200-degree magnetic heading. The site was located about 100 feet from the edge of the woods. A clearing about 350 feet wide by 430 feet long was located north of the accident site. The area included a 150-foot by 50-foot pole-barn structure located near the west side of the clearing. The elevation of the clearing was about 1,150 feet, which was about 24 feet above the elevation of the accident site.

G. SUMMARY OF AIRCRAFT EXAMINATIONS¹

Airframe – Cessna 182L (s/n 18259007)

The engine was partially separated from the fuselage. The firewall was deformed. The upper engine cowling was separated from the airframe at the time of the post-accident examination; the lower cowling remained attached. Both sections of the cowling were damaged, with the lower cowling exhibiting deformation consistent with aft crushing/impact forces.

The forward fuselage was deformed. The windshield was fragmented and separated; although, a portion of the left side of the windshield remained with the fuselage. The forward door posts had separated near the lower ends. The upper fuselage was dislocated

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

Summary of Accident Site and Aircraft Examinations

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

upward and aft. Both cabin doors had separated at the hinges and were located adjacent to the airplane. The center fuselage was bent downward at the aft edge of the cabin doors relative to the forward fuselage section. The aft fuselage structure was bent upward relative to the center fuselage section about halfway between the baggage area and the empennage. The aft fuselage structure was buckled in that area.

The left wing remained attached to the fuselage. It was dislocated upward and aft with the corresponding displacement of the fuselage cabin roof. The inboard leading edge exhibited crushing damage, with localized tearing/separation of the leading edge skin. The outboard portion of the left wing was separated about mid-span. The outboard wing section was located on the ground adjacent to the airplane. The wing section was damaged from the leading edge to the aft spar, with significant deformation and tearing of the wing skin and sub-structure. The aileron remained attached to the left wing. It was partially separated at the mid-span skin splice. Aileron control continuity was confirmed to the wing root. Both the control and cross-over/balance cables were separated at the wing root. The cable separations were frayed and appeared consistent with overstress failures. The flap remained attached to the inboard wing section. Flap control continuity was confirmed to the wing root. The wing strut remained attached to both the wing and the fuselage; however, it was separated adjacent to the fuselage.

The right wing was partially separated from the fuselage at the wing root. It was dislocated upward and aft with the corresponding displacement of the fuselage cabin roof. The inboard portion of the wing exhibited crushing damage along the leading edge. The center portion of the damaged area displayed a crescent-shape deformation consistent with impact to an adjacent tree. The remainder of the wing skin was deformed and creased over the entire inboard section. The inboard portion of the wing was partially separated from the outboard portion near mid-span. The outboard portion of the wing and wing tip appeared intact. The wing strut remained attached to fuselage structure. However, a section of the mating structure had separated from the lower fuselage. The strut remained attached to the wing. The aileron and wing flap remained attached. The aileron cables were continuous to the wing root. The aileron control cable was separated at the root; the cross-over/balance cable was separated near the left wing root. The cable separations were frayed and appeared consistent with overstress failures. The flap linkage appeared continuous to the wing root; however, the flap cables were separated at the root. The flap actuator extension was consistent with a flap UP position.

The horizontal and vertical stabilizers remained attached to the aft fuselage. The rudder and elevators remained attached to the corresponding stabilizers. The control surfaces appeared intact and undamaged with one exception. The right elevator exhibited a tear through the upper and lower skins from the trailing edge to near the forward spar, immediately inboard of the trim tab. The elevator trim tab remained attached and appeared intact. Rudder and elevator control continuity was confirmed from the control surfaces to the cockpit.

The instrument panel was partially dislocated consistent with the surrounding damage to the fuselage structure. The cockpit controls appeared intact; however, the pilot's control wheel was separated from the control column at the time of the examination. Aileron control cable continuity was confirmed from the control columns to the door posts. The aileron control cables were separated at the door posts. The cable separations appeared

Summary of Accident Site and Aircraft Examinations

G. SUMMARY OF AIRCRAFT EXAMINATIONS *(continued)*

consistent with overstress failures. Rudder and elevator control continuity was confirmed from the control surfaces to the rudder pedals and the cockpit control column, respectively. The engine magneto switch was positioned to BOTH. Each engine control was in the full forward position. The fuel selector was positioned mid-way between the LEFT and BOTH settings at the time of the examination. The tachometer appeared intact and indicated 2,942.74 hours.

The pilot seat and associated seat tracks appeared to be intact. The seat remained attached to the seat tracks, and the seat tracks appeared to be securely attached to the cabin floor/lower fuselage. The pilot's lap belt remained attached to the floor anchor points and appeared intact and functional. A shoulder harness was not installed.

Engine – Continental O-470-R (s/n 191787-8-R)

Propeller – McCauley 2A34C66-NP (Hub – s/n 741274 / Blades – not legible)

The engine was partially separated from the airframe; however, it was located in position relative to the airframe. The propeller assembly remained attached to the engine crankshaft.² The propeller flange appeared undamaged. The engine mounts were fractured; the appearance of the fracture surfaces was consistent with overstress failures. All cylinders remained secured to the crankcase. However, the no. 6 (forward / left) cylinder exhibited crushing damage to the forward cooling fins consistent with impact. The crankcase was also fractured adjacent to the no. 6 cylinder.

The spark plugs and ignition harness were securely installed and intact. The upper spark plugs were removed. The spark plug electrodes appeared undamaged; they exhibited a dark discoloration but appeared free of any debris/contamination buildup. The right side valve covers were intact; two of the left side valve covers (common to the no. 2 and no. 6 cylinders) exhibited holes consistent with impact damage. The magnetos remained securely attached to the engine. Both magnetos were equipped with impulse couplings. Each magneto produced a spark at all spark plug leads via the ignition harness when rotated.

The engine was rotated and exhibited internal valve train and accessory section continuity. Compression and suction was observed at all cylinders. The cylinder head and rocker arms exhibited a dark discoloration similar to that observed on the spark plug electrodes. The oil screen was securely installed. The screen contained a small amount of debris or contamination, which did not appear significant enough to affect the oil flow. The oil cap was installed and the filler tube remained attached to the engine. The propeller governor housing was fractured, with the upper portion separated. The governor base remained securely attached to the crankcase.

The air intake was separated from the carburetor, but otherwise appeared unremarkable. The carburetor remained attached to the engine and appeared intact. The throttle and mixture control cables were attached to the respective carburetor controls; the control cables were continuous to the firewall. The throttle lever was free to rotate and the butterfly valve was intact. The floats and metering mechanism appeared undamaged and functional. The accelerator pump provided a small amount of fuel when inadvertently actuated during the disassembly. A clear fluid consistent in odor to automobile fuel was

² The propeller was removed during the course of the examination.

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G. SUMMARY OF AIRCRAFT EXAMINATIONS *(concluded)*

observed in the carburetor. The fuel strainer/gascolator remained attached to the firewall and appeared intact. A small amount of clear fluid consistent in odor to automobile fuel was recovered from the strainer after removal of the gascolator. The fluid appeared to be clean and free of debris or sediment.

Engine control continuity was confirmed from the cockpit controls to the carburetor. No determination could be made regarding the position of the controls prior to impact due to the dislocation of the engine relative to the airframe firewall.

Both propeller blades remained attached to the hub and the hub appeared intact. However, one blade was loose in the hub. Both blades appeared intact. One blade exhibited minor bending at the tip.