



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Central Region

July 3, 2021

ON SCENE OBSERVATIONS

CEN21FA300

This document contains 33 embedded photos.

A. ACCIDENT

Location: Roff, Oklahoma
Date: July 2, 2021
Aircraft: Beech 35-33, Registration N302Z
NTSB IIC: Samantha Link

B. EXAMINATION PARTICIPANTS:

Samantha Link
Aviation Accident Investigator
National Transportation Safety Board
Denver, CO

David Amann
Principal Avionics Inspector
Federal Aviation Administration
Oklahoma City, OK

Buck Welch
Manager Air Safety
Textron Aviation
Wichita, KS

James Wirt
Principal Maintenance Inspector
Federal Aviation Administration
Oklahoma City, OK

C. SUMMARY

An on scene examination of the airframe and engine was conducted on July 3, 2021. No anomalies were noted during the examination.

D. DETAILS OF THE INVESTIGATION

1.0 Accident Site Overview

The accident occurred in a remote area, about 14 miles southwest of Ada Regional Airport (ADH).

The debris field was about 70 yards long, along a heading of about 110 degrees (East Southeast). The airplane first impacted small trees, then entered a patch of medium sized trees. The first identified piece of airplane debris was the left wingtip. Followed by left aileron and a small portion of the left-wing leading edge. Next was a large narrow ground scar along the dirt with the pitot tube inside.

The next major pieces of debris were the right wing, right side front passenger seat, and the airplane door. The right wing was fracture separated from the fuselage at the wing root. The wing came to rest leading edge down with the root of the wing wrapped around a medium sized tree. The tree was bent and damaged consistent with the direction of the debris path. A portion of the left wing, with the inboard left aileron attached, was also located near the right wing.

The main wreckage was about 4 yards beyond the right wing. It consisted of the cabin area, aft fuselage, and inboard left wing. About 6 feet beyond the main wreckage was the engine. The engine was fracture separated

from the firewall and engine mounts; it came to rest on its left side against two small trees. The final pieces of debris were a fragment of the rudder pedal and the starter.

1.1 Accident Site Photos



Figure 1: View from the Start of the Debris Path

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Figure 2: View of the Airplane's Entrance into the Trees



Figure 3: View of the Debris Path Toward the Main Wreckage



Figure 4: Ground Scar, Right Wing and Main Wreckage



Figure 5: The Right Wing



Figure 6: Left Side of Airplane/Main Wreckage



Figure 7: The Main Wreckage

2.0 Airframe Examination

- The left wing remained attached at the wing root and was fracture separated about midspan.
 - The inboard portion of the fracture exhibited up and aft crush damage.
 - The left main landing gear was in the down and locked position.
 - The fuel filler cap remained in place and there was no evidence of fuel staining or leaking on the wing surface.
 - The cap was removed, and fuel was observed inside of the tank. It smelled consistent with 100LL.
- The inboard portion of the left aileron and a fragment of the left wing were fracture separated and exhibited extensive aft crush damage.
- The left-wing wingtip, outboard left aileron, and a small portion of the leading edge were fracture separated and located early in the debris path.
- The right wing remained whole and was fracture separated at the wing root. The right wing came to rest leading edge down with the underside of the wing facing toward the end of the debris path.
 - The right main landing gear was fracture separated and was located nearby.
 - The right-wing fuel tank remained intact, and the fuel cap remained secured to the wing.
 - There was no evidence of fuel staining or leaking.
 - The aileron control cables remained attached to the control surface and extended beyond the wing root.
- The cabin area exhibited extensive damage.
 - The roof and right side of the cabin were mostly fracture separated.
 - The forward left seat remained attached and secured to the airframe.
 - The front passenger seat was fracture separated from the cabin and found within the debris path.
 - The back bench seat was fractured from the fuselage but remained within the cabin area.
 - The instrument panel was heavily fragmented. The recovered instruments and radios exhibited crush damage and were unremarkable.
 - The fuel selector was positioned on the right-wing fuel tank.
 - The landing gear actuator indicated that the gear was in the down position.
- The firewall was completely fracture separated from the airframe and engine.
 - It exhibited crush damage.
- The nose landing gear was fracture separated from the fuselage and found within the debris path.
- Flight control continuity was established throughout the airframe:
 - The center cabin area exhibited extensive crush damage and the flight controls were unable to be visually observed in this area.
 - The rudder control cable was continuous throughout.
 - The right-wing aileron cable remained attached at the control surface and extended beyond the wing root.

- The left-wing aileron cable was fracture separated at the aileron control consistent with overload. The cable was then observed at the fracture surface midspan and traced to the center cabin area.
 - The left aileron cable remained attached to the aileron surface but was fracture separated consistent with overload.
- The elevator control cable was traced from the control surface to the center cabin area. It was then traced from the elevator control toward to the center cabin area.
- The aileron trim was unreliable due to impact related damage.
- The flap actuators were examined:
 - The right-side actuator was fracture separated and unable to be measured.
 - The left-side actuator was measured about 2 inches, which is consistent with the “up” position.
- The aft fuselage was bent and mostly fractured just aft of the cabin.
 - It exhibited crush and crumple damage throughout.
 - There was a large horizontal tear along the right side.
- The ELT was located and found in the “armed” position.
- The empennage remained mostly whole:
 - The horizontal stabilizer exhibited some crush damage.
 - The elevators and rudder remained attached.
 - The elevator trim was about neutral.
 - The vertical leading edge exhibited crush damage.

2.1 Airframe Photos



Figure 8: The Left Wing



Figure 9: Left wing midspan fracture surface



Figure 10: Fragment of Left Wing (Inboard Aileron)



Figure 11: Left Outer Wing Fragments



Figure 12: Left-side Flap Actuator



Figure 13: The Aft Fuselage

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Figure 14: Empennage



Figure 15: Top of Right Wing



Figure 16: The Cabin Area



Figure 17: Fuel Selector Valve



Figure 18: Instrument Panel Fragments



Figure 19: Attitude Indicator

3.0 Engine Examination

- Visual examination did not reveal any indications of catastrophic failure.
- The engine came to rest on its left side against two smaller trees.
- The propeller hub was rotated, and it moved freely in the allowable space.
 - Corresponding rotation was observed on the accessory side of the engine.
 - The crankshaft was bent just aft of the propeller hub.
- The right-side spark plugs were removed, and all were consistent with normal operations.
 - The center electrodes were more circular than oval.
- The rocker covers were removed, and all valve assemblies were consistent with normal operations.
- The fuel manifold was disassembled, and no anomalies were noted with its internal components.
 - The diaphragm was palpable, and the screen was clear of debris.
 - Fuel was noted within the manifold.
- The left side of the engine exhibited more impact damage than the right side.
 - The #4 and #2 cylinder rocker covers exhibited impact damage and the valves were exposed.
 - The #4 cylinder head exhibited fracture damage and the cooling fins were bent.
- The left side spark plugs were removed with the exception of the #4 and #6 lower spark plugs, which were inaccessible due to exhaust stack deformation.
 - All removed spark plugs were consistent with normal operations.
 - They were covered in oil consistent with how the engine had been resting.
 - The upper portion and lead of the #6 cylinder upper spark plug were fracture separated.
- The left side rocker covers were removed.
 - The valves were oily, consistent with how the engine came to rest.
- The ignition harness was mostly intact.
 - The upper left side leads exhibited damage consistent with impact.
- Due to damage, the ignition leads were cut. The magnetos were removed from the engine and rotated by hand.
 - Spark was obtained on all lead ends.
- The fuel servo was fracture separated from the engine.
 - The mixture lever moved freely from stop to stop.
 - The throttle lever moved freely but was restricted consistent with impact damage.
 - Corresponding motion was observed on the butterfly valve.
- The spinner remained attached to the propeller hub and exhibited crush damage.
- The two propeller blades remained attached at the hub. Both blades rotated freely within the hub.
 - One blade was flattened, and the outboard tip was curled aft.
 - Chordwise diagonal dirt score marks were noted along the chamber side of the blade.
 - The second blade was bent aft about midspan and the outboard tip was curled aft.
 - Both spanwise and chordwise scoring was noted on the chamber side of the propeller blade.

3.1 Engine Photos



Figure 20: The Engine



Figure 21: The Accessory Section of the Engine

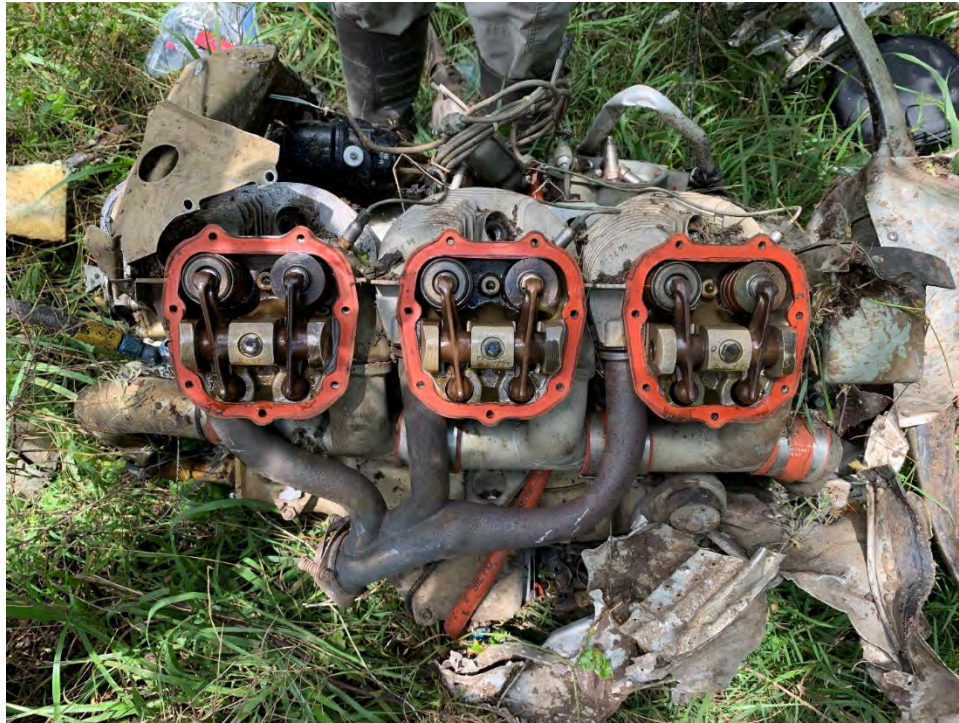


Figure 22: Right Side of Engine



Figure 23: Right Side Upper and Lower Spark Plugs



Figure 24: Left side of Engine



Figure 25: Left Side Valve Assemblies



Figure 26: Left Side Spark Plugs



Figure 27: The Fuel Manifold



Figure 28: Bent Crankshaft

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Figure 29: Propeller Blade Assembly

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Figure 30: One Propeller Blade



Figure 31: The Second Propeller Blade

END.

Submitted by: Samantha Link