

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR22FA256

ACCIDENT SITE, AIRFRAME, AND ENGINES EXAMINATION

February 17, 2023

A. ACCIDENT

Location: Gold Hill, Colorado
Date: July 17, 2022
Time: 0938 mountain daylight time
Airplane: N337KN, Cessna P337G

B. ACCIDENT SITE, AIRFRAME, AND ENGINES EXAMINATION

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C. DETAILS OF THE EXAMINATION

1.0 Accident Site

GPS Coordinates: N040.068681, W-105.429299
Elevation: 7,789 ft msl

Examination of the accident site revealed that the airplane impacted mountainous terrain on a heading of about 283° magnetic. The first identified point of contact was a cluster of 3 trees, that were severed/broken about 17 to 20 ft above the ground. The trees were grouped within an area of trees that were about 75 to 100 ft in height.

The airplane came to rest mostly upright on a heading of about 091° magnetic. All major structural components of the airplane were located within about a 30 ft by 40 ft area. The area surrounding the wreckage was fire damaged.

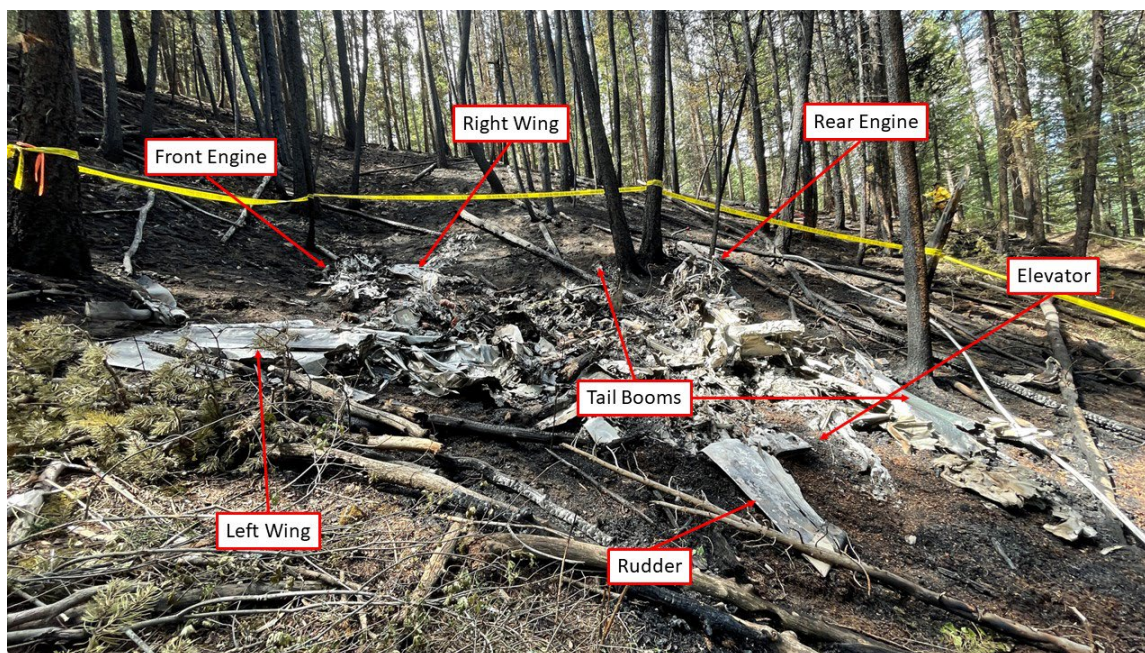


Figure 1: Accident Site Diagram

The fuselage was mostly consumed by fire, with no relative structure discernable. A portion of the instrument panel was observed with various avionics separated, and thermally damaged. The throttle quadrant was located and exhibited impact and thermal damage. The fuel selector valves were located within the wreckage. Both valves were in an "open" position, however, due to impact and thermal damage, it was not able to be determined which fuel tank or which position the fuel selector valves were from.

Both tailbooms were located at the accident site and exhibited varying degrees of thermal/fire damage. The elevator was observed between the tailbooms and was fire damaged. Remains of the rudders were observed at the accident site.

The left wing was located adjacent to the fuselage, however, was displaced and found in an orientation that paralleled the fuselage. The inboard portion of the wing structure was mostly consumed by fire. The outboard portion of the wing was observed, and the outboard portion of the aileron remained attached to its mount. The unconsumed portion of the leading edge of the wing was slightly crushed throughout.



Figure 2: Left wing

The right wing was located adjacent to the fuselage and was damaged by fire. The leading edge of the wing was crushed aft throughout its span to the main spar. The aileron remained partially attached (inboard mount) and was slightly displaced aft about 45°.



Figure 3: Right Wing

Flight control continuity was established from the middle area of the fuselage to all primary flight control surfaces. Multiple areas of separation in the control cables were observed, which exhibited splayed signatures, consistent with tension overload.

The front engine appeared to have remained attached to the airframe and exhibited varying degrees of thermal damage. The induction system was impact damaged. The throttle cable remained attached to the throttle body. The propeller was separated from the crankshaft. Both propeller blades exhibited varying degrees of "S" bending, along with leading edge nicks and polishing. One propeller blade appeared in the feathered position, and the opposing blade appeared to be in a non-feathered position.



Figure 4: Front engine



Figure 5: Front propeller

The rear engine remained attached to the engine mount structure and was found in an inverted position. The engine sustained significant thermal and impact damage. The oil sump was partially burned away, exposing the internal components of the engine. The 1/3/5 side of the engine exhibited significant impact damage to the cylinder heads. The turbo charger was impact damaged. The propeller remained attached to the engine, and both propeller blades appeared to be in a feathered position. One propeller blade exhibited a slight bend toward the non-cambered side of the blade just outboard of mid span. The opposing propeller blade appeared undamaged.



Figure 6: Rear engine and propeller

2.0 Recovered Wreckage Examination

Examination of the recovered wreckage was conducted on February 15/16, 2023, at the facilities of Beegles Aircraft Company, Greeley, Colorado.

2.1 Front Engine

Continental Motors
TSIO-360-CB5B
S/N: 236233-R

The front engine was separated from its mounts. The engine exhibited extensive thermal and impact damage throughout. A large crack extending from the no. 6 cylinder across the upper portion of the crankcase, and downward in front of cylinder no. 5, to an area near the fuel pump mount was observed. The accessory housing was impact and thermally damaged, exposing the camshaft gears, crankshaft gears, and idler gears. The fuel pump was separated from its mounts. The starter adapter was impact and thermally damaged and separated from the engine. Visual mechanical continuity was established throughout the engine (crankshaft, camshaft, connecting rods). The cylinder no. 3 intake and exhaust rocker arms, and cylinder no. 5 exhaust rocker arm were intact. The throttle interconnect was intact and fire damaged and the throttle plate appeared to be in the full open position.



Figure 7: View of the front engine

The fuel pump would not rotate by hand and exhibited impact damage. The drive coupling was present and impact damaged. The fuel pump was disassembled and found unremarkable.

The fuel manifold valve was intact, however, exhibited thermal damage. The fuel manifold valve was disassembled. The diaphragm was thermally damaged, and the spring was intact. The screen contained burnt debris.

The fuel nozzles were unable to be removed.

The induction system was impact and thermally damaged.

The exhaust system and turbo were separated from the engine.

The upper and lower spark plugs were unable to be removed.

The ignition harness was thermally damaged.

The left and right magneto were not located, however, their drive couplings remained attached to the engine accessory drive gears.

The turbo charger was separated from the engine. The compressor inlet was obscured by a rubber/cloth boot, and displaced inward. The compressor wheel blades were intact. The turbine housing V band clamp was in place, but impact damaged. The turbine wheel and blades were intact. The turbine wheel and compressor wheel would not rotate by hand.

The waste gate and controller were impact and thermally damaged.

2.2 Rear Engine

Continental Motors
TSIO-360-CB6B
S/N: 1005983

The rear engine was separated from the engine mount, however, the engine mount remained entangled around the exhaust and turbocharger. The engine exhibited varying degrees of thermal and impact damage throughout. The magnetos were not located. The starter was not located.

Visual mechanical continuity was established throughout the crankshaft, camshaft, and connecting rods when looking through the burned away portion of the oil sump. The rocker box covers for cylinders 2, 4, and 6 were removed. Cylinder no. 4, 6, intake and exhaust rocker arms, and cylinder no. 2 exhaust were oil coated. The intake rocker arm on cylinder no. 2 was thermally damaged. Cylinders no. 2, 4, and 6 examined internally using a borescope, and were unremarkable with the exception of corrosion throughout the cylinders.



Figure 8: Cylinder 1, 3, and 5 side of the engine

Cylinders 1, 3, and 5 exhibited extensive impact and thermal damage. The pistons of cylinder no. 1, 3, and 5 were exposed and exhibited varying degrees of corrosion.

The cylinder no. 2, 4, and 6 spark plugs exhibited dark deposits within the electrode area along with worn-normal signatures.

The no. 2 fuel injector nozzle was impact damaged / bent, thermally damaged. The no. 4 and 6 fuel injector nozzles were free of debris.

The fuel pump was impact and thermally damaged. The aneroid valve was thermally damaged. The fuel pump drive coupling was intact. The fuel pump drive shaft would not rotate by hand. Disassembly of the fuel pump revealed corrosion and thermal damage throughout. The mixture control lever was separated, however, a portion of the lever remained attached to the mixture control cable.

The fuel manifold valve remained attached to the engine and exhibited thermal damage. The fuel manifold valve was disassembled. The spring was intact.

The diaphragm was thermally damaged and was unable to be removed from the fuel manifold valve cavity.

The induction system was impact and thermally damaged. The throttle plate was observed in an almost closed position. The throttle control cable remained attached to the throttle arm. The linkages from the throttle assembly to the turbo controller remained intact. The linkages moved when activated by hand using a wrench.

The propeller governor control cable remained secure to the propeller governor. The propeller governor was removed. The screen was free of debris, and the propeller governor drive shaft rotated freely by hand.

The turbo charger waste gate was impact and thermally damaged.

The turbo controller was thermally damaged.

The turbine/compressor wheels would not rotate by hand.

The compressor housing was not observed. The compressor wheel exhibited thermal damage impact damage with varying degrees of damage to the blades.

The turbine housing was impact and thermally damaged. The turbine side housing v-band clamp was intact. The housing was removed, and the turbine wheel blades were intact.

Submitted by:

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