



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

November 19, 2021

ACCIDENT SITE / AIRFRAME / ENGINE EXAMINATION SUMMARY

WPR20FA108

This document contains 7 embedded photos.

A. ACCIDENT

Location: Sylmar, California
Date: March 13, 2020
Aircraft: Mooney M20K, N777WP
NTSB Investigator-in-Charge: Joshua Cawthra

B. DETAILS OF THE INVESTIGATION

1.0 Accident Site Examination

GPS Coordinates: N34.329113, W-118.527948
Elevation: 2,315 Ft MSL

Examination of the accident site revealed that the airplane impacted power lines, which were about 50 ft in height, on a heading of about 064° before impacting terrain about 250 ft east and downslope of the powerlines. The fuselage came to rest inverted on heading of about 014° magnetic in a canyon surrounded by mountainous tree covered terrain at an elevation of about 2,315 ft mean sea level (msl). The wreckage debris path was measured about 260 ft in length, oriented on a heading of about 064° magnetic.

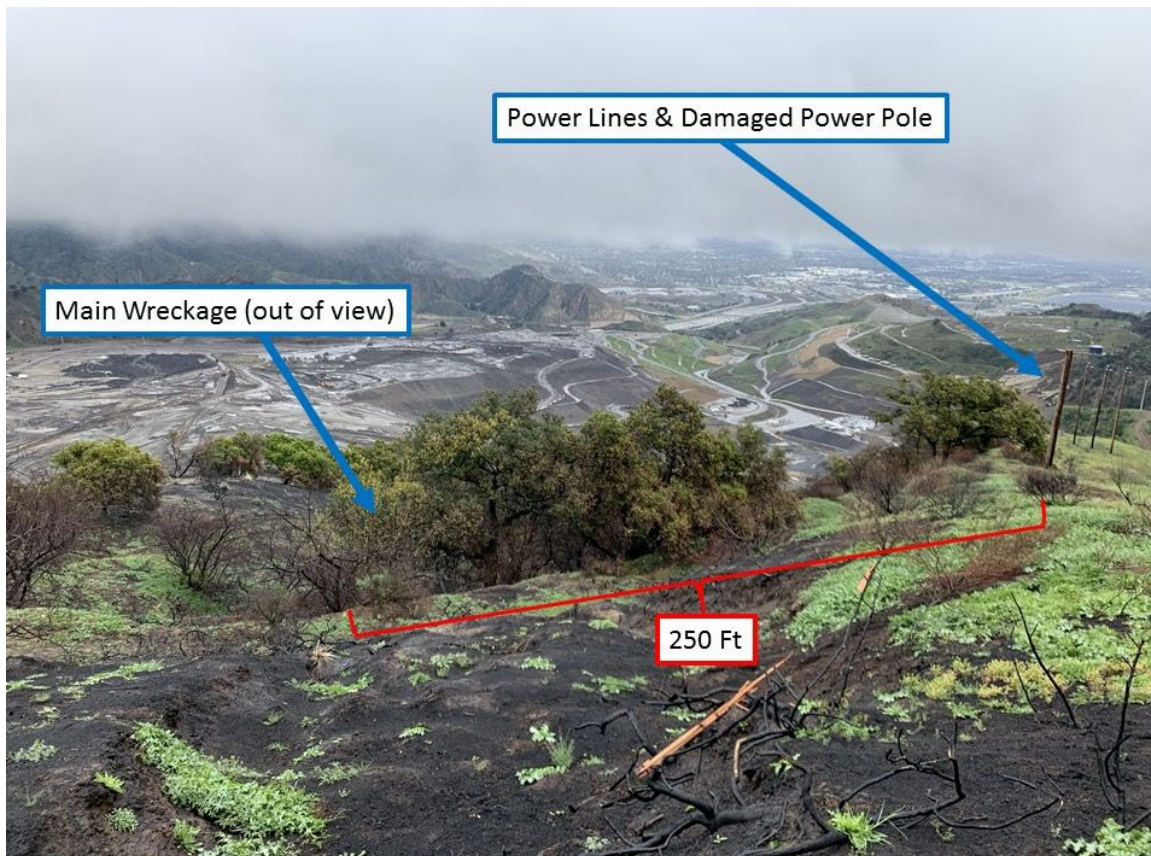


Figure 1: Accident Site Diagram

The fuselage was compressed throughout its length. The instrument panel was impact damaged with numerous instrument and radio separation observed. A portion of the right side of the fuselage was cut by first responders. The left side fuselage inspection cover was removed to turn off the emergency locator transmitter (was on, and functioning). The engine was displaced and partially attached to the fuselage. The induction system appeared to be intact. The propeller remained attached to the engine. One blade exhibited leading edge polishing, blade face polishing, and a portion of the propeller blade tip separated.



Figure 2: View of the engine, propeller, and portion of the fuselage and right wing.

Both wings remained attached to the fuselage. The left main landing gear and nose wheel landing gear were in the extended position. The left wing was intact, and the flap and aileron remained attached via their mounts. The left wing exhibited bending and buckling throughout. The right wing was mostly intact, and bent and buckled throughout, with the exception of the outboard portion of the right wingtip and right aileron. The right flap remained attached via its mounts. The right main landing gear was retracted, and the right gear door exhibited a partial tear in the lower portion of the door and was bent and buckled. No wire marks were observed on the gear door.



Figure 3: Main Wreckage

The empennage was separated from the fuselage just aft of the horizontal stabilizers. Both left and right horizontal stabilizers, elevators, vertical stabilizer, and rudder remained attached to the empennage. A portion of a braided power line remained entangled within the right elevator. The rudder exhibited a trailing edge indentation about mid height, that extended forward to just before the rudders spar. The upper portion of the rudder and vertical stabilizer was crushed downward.

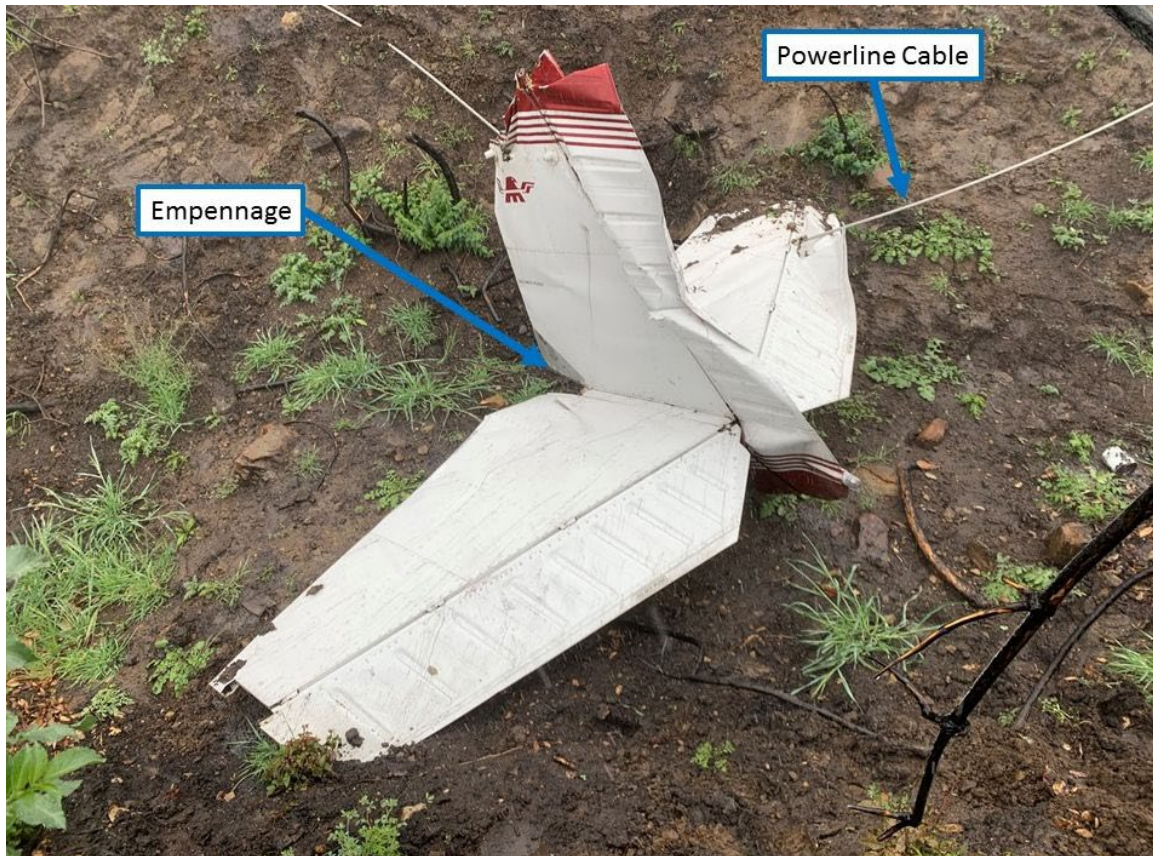


Figure 4: Empennage

All major structural components of the airplane were observed at the accident site throughout the wreckage debris path.

2.0 Recovered Airframe Examination

Examination of the recovered wreckage revealed that the cabin roof and aft fuselage structure, and engine were separated by wreckage recovery personnel to facilitate wreckage recovery.



Figure 5: View of the recovered wreckage.

The instrument panel was separated from the cabin structure.

Airspeed: 0

Turn Coordinator: Right turn, ball deflected to the right

Altimeter: 6,300, Kollsman: 29.90

VSI: 850' climb

ADF: 025, arrow: 150

HIS: Separated from the panel, Nav / HDG flags shown, set to 090/east, bug: 172 deg.

Manifold Pressure: 31 inches, impact damaged and separated

All circuit breakers found to be "in"

Mixture and propeller controls were full forward, throttle was impact damaged

Flight control continuity was established from the cockpit to all primary flight controls. Numerous separations were noted within control system and were found consistent with being cut by wreckage recovery personnel or they exhibited signatures consistent with overload separation.

The fuel selector was in the "OFF" position and was reportedly placed there by first responders. The selector valve was placed in the "left" and "right" positions, and compressed air was applied to the fuel outlet line. Air was heard moving throughout the fuel valve to both fuel tanks.

The vacuum system (filter, vacuum lines) were impact damaged. The filter was mostly intact and appeared to be unrestricted.

The King KI-256 instrument was impact damaged, which precluded functional testing. The gyro gimble was removed and disassembled. The gyro exhibited some rotational scoring



Figure 6: King KI-256



Figure 7: King KI-256 Gyro

3.0 Recovered Engine Examination

The engine was separated from the engine mount structure. The right magneto, oil filter, and starter were separated.

The upper spark plugs, propeller, left magneto, and fuel pump were removed.

The crankshaft was rotated by hand using a hand tool attached to the crankshaft. Rotational continuity was established throughout the engine and valve train. Thumb compression was obtained on all 6 cylinders.

The turbo charger was intact and impact damaged. All "V" bands were found secure. The turbo shaft rotated freely by hand. The overpressure valve was intact.

The exhaust system was impact damaged and appeared free of obstructions.

The induction system was impact damaged and found free of obstructions.

The fuel pump was impact damaged. The mixture shaft was impact damaged. The anaroid valve was impact damaged. The drive shaft was intact and undamaged. The fuel pump drive rotated freely by hand.

All 6 fuel injectors were free of debris.

The throttle body was impact damaged. The throttle plate was observed in the near fully open position. The throttle cable end remained attached to the throttle body.

The fuel manifold valve was intact. All fuel injector lines were intact and free of debris. The fuel manifold valve was disassembled. The internal spring and diaphragm were intact. The screen was free of debris.

The left magneto remained secure to the engine and was intact. When the magneto drive shaft was rotated by hand, impulse coupling engagement was noted, and spark was produced on all ignition leads posts.

The right magneto was intact with some damage noted to the mounting flange (consistent with impact and separating). The magneto hold down nuts and pads were in place and secure. When the magneto drive shaft was rotated by hand, impulse coupling engagement was noted, and spark was produced on all ignition leads posts.

The ignition harness was impact damaged.

The spark plugs exhibited normal operational signatures and gray deposits within the electrode areas.

The vacuum pump remained attached to the engine. The drive coupling and shear coupling were intact and undamaged. The vacuum pump was disassembled, and the rotor was fractured, consistent with impact. All of the vanes were intact.

The propeller governor remained attached to the engine. The control linkage remained attached to the governor.

Both propeller blades remained attached to the propeller hub, however, were free to rotate within the hub. One propeller blade exhibited bending in the opposite direction of rotation, with polishing of the blade face along with chordwise striations on the cambered side of the blade. A portion of the blade tip was separated. The opposing propeller blade was bent forward about 90 degrees about 12 inches from the propeller hub and the blade exhibited "S" bending and opposite direction of rotation bending throughout along with blade face polishing and chordwise striations on the cambered side of the propeller blade.

Submitted by: Joshua Cawthra