



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

January 4, 2022

ACCIDENT SITE EXAMINATION SUMMARY

WPR22FA073

This document contains 13 embedded photos.

A. ACCIDENT

Location: Manana, Arizona
Date: January 4, 2022
Aircraft: Mooney, M20C, N6796N
NTSB Investigator-in-Charge: Eric M. Gutierrez

B. DETAILS OF THE INVESTIGATION

1.0 Airplane Accident Site Examination

GPS Location: 32.691664 -112.127894
Elevation: 2162 ft mean sea level (MSL)

Examination of the accident site revealed that, the airplane impacted hilly, desert terrain. The main wreckage (aft fuselage and empennage) came to rest on its left side, on a heading of about 255° magnetic, at an altitude of 2162 ft mean sea level.

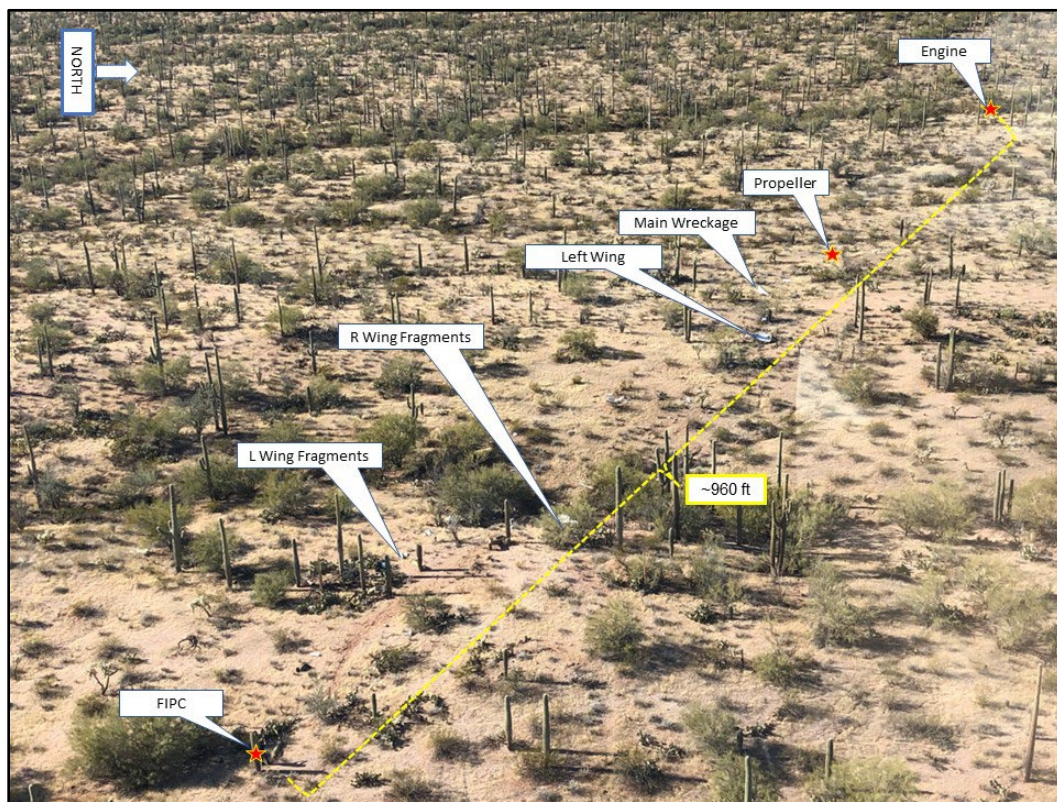


Figure 1: View of accident site diagram.

The first identified point of contact (FIPC) with terrain was an impact mark a saguaro cactus that was 128° magnetic and about 381 ft from the main wreckage. The impact made on the saguaro cactus was about 10 ft high and detached the remaining cactus. The debris field was located on flat, uneven desert terrain, on a magnetic heading of 308° degrees from FIPC, about 960 ft in length and 250 ft wide.



Figure 2: View of impact on saguaro cactus.

The first identified piece of wreckage was located near the FIPC and consisted of left wing fragments. Throughout the debris path, various portions of aluminum wing skin, left and right wing fragments, left and right ailerons, engine, propeller, exhaust system, foam, and plexi glass were observed.



Figure 3: View of left wing fragments near FIPC.

2.0 Airframe Examination

Manufacturer: Mooney

Model: M20C

Serial Number: 68-0099

The forward section of the fuselage was heavily impact damaged and separated. The engine, engine mount, nose landing gear, firewall, instrument panel, cockpit, flight controls, and seats were separated and located within debris field. The cabin area was separated behind the rear seatbacks. The instrument panel was recovered with various instruments separated. The cabin door was recovered. The engine mount had several fractures, consistent with impact damage. The aft section of the fuselage exhibited buckling and compression crushing throughout.

Flight control continuity was not established due to impact damage and multiple separations of the flight control cables throughout the entire airplane.



Figure 4: View of firewall and instrument panel.



Figure 5: View of airplane instrument panel.

The left wing separated from the fuselage at the wing root and fragmented into numerous sections and were scattered throughout the debris field. The left wing aileron separated from the wing attachment points and was located in the debris field, crushing and bending was observed on both ends. The left aileron bell crank remained attached with about a 1 in section of push rod control tub attached. The left main landing gear remained attached via the wing mounts and was retracted. The left main fuel tank fuel cap was observed in place and secure.



Figure 6: View of left wing

The right wing separated from the fuselage at the wing root and fragmented into numerous sections and were scattered throughout the debris field. The right wing aileron separated from the wing attachment points and was located in the debris field, crushing and bending was observed on both ends. The right aileron bell crank remained attached to the aileron with about a 1 in section of push rod control tub attached. The right main landing gear lift strut separated from the right wing and was located in the debris field.



Figure 7: View of right wing fragment.

The empennage remained attached to the aft fuselage. The vertical stabilizer was separated from the empennage, exhibited impact damage, crushing and bending throughout. The rudder separated from the vertical stabilizer and exhibited impact damage, crushing, and bending throughout. The left horizontal stabilizer was partially separated from the empennage, the elevator remained attached to their respective attachment points and the control tubes were traced to the center of the fuselage, where they were separated from the flight controls. The right horizontal stabilizer was separated from the empennage, the elevator remained attached to their respective attachment points.



Figure 8: View of airplane empennage.

3.0 Engine Examination

Engine Manufacturer: Lycoming
Engine Model Number: O-360-A1D
Engine Serial Number: RL-26163-36E

The engine was separated from the engine mount and came to rest about 565 ft, northwest of the main wreckage. All four engine mounts had fracture separated. All four cylinders remained attached and exhibited impact damage. The cylinder rocker box covers remained attached to the cylinder and exhibited impact damage. The intake and exhaust were separated and exhibited impact damage. The propeller governor was separated from the engine, exhibited impact damage and located in the debris field. The engine driven fuel pump remained attached to the engine accessories case and was impact damaged. The oil suction screen was removed and free of visible contaminants.



Figure 9: View of airplane engine.

The crankcase sustained impact damage at the nose section and crankshaft. The crankshaft could be rotated approximately 270 degrees. Accessory gear movement was observed during crankshaft rotation. The pushrod tubes at each cylinder remained undamaged. There was no evidence of pre-impact catastrophic mechanical malfunction or fire.

Both magnetos separated from the engine and were located within the debris field. A visual examination of the magnetos revealed impact damage to both magnetos. The fracture surface signatures at the magneto-mounting flange were consistent with overload. Magneto to engine timing could not be determined. The magnetos sustained varying degrees of damage that rendered the units inoperative and therefore, could not be functionally tested. When rotated by hand, both magnetos drive shaft rotated freely.

The carburetor with an attached portion of the plenum had been separated from the engine and was located in the debris field near the main wreckage. The fracture surfaces exhibited signatures consistent with overload. The fuel inlet line was removed, and the fuel screen was free of debris and found unremarkable. The throttle lever was intact, undamaged, and freely from stop to stop.



Figure 10: View of carburetor.

The engine driven fuel pump remained attached to the engine at the mounting pad. The fuel lines had been separated at their respective fittings. The fuel pump removed and disassembled. The fuel pump was free of internal mechanical malfunction and obstruction to flow. The diaphragm remained pliable and intact.

The top spark plugs were removed from the engine, and they were the massive electrode type. The spark plugs from the 1 and 2 cylinders were oil soaked, consistent with engine positioning at the accident location. The spark plugs from the 3 and 4 cylinders, when compared to the Champion Check-A-Plug chart, the sparkplugs were light grey in color, exhibited “NORMAL.”



Figure 11: View of top spark plugs (photo courtesy of Lycoming Engines)

The vacuum pump was separated and located in the debris field near the main wreckage. The vacuum pump exhibited impact damage. The vacuum pump was disassembled. The rotor and veins were fragmented. The vacuum pump drive was impact damaged.



Figure 12: View of vacuum pump.

4.0 Propeller Examination

Propeller Manufacturer: Hartzell

Propeller Serial Number: CH 39732B

The airplane was equipped with a two blade Hartzell propeller. The propeller and attached crankshaft flange separated from the engine at the crankshaft. Both blades remained attached to the propeller hub. Propeller blade A exhibited 90° bend near the propeller tip, with polishing along the leading edge, with unidirectional striations on the cambered side of the blade. Propeller blade B exhibited bending forward about mid span, with unidirectional striations on the cambered side of the blade.



Figure 13: View of airplane propeller.

Submitted by: Eric M. Gutierrez