

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

SUMMARY OF AIRCRAFT EXAMINATION

-- CEN19FA032 --

A. ACCIDENT

Location: Santa Fe, New Mexico
Date: November 26, 2018
Time: 1950 mountain standard time
Aircraft: Mooney M20C (s/n 3402), N113TA

B. PARTICIPANTS

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

Troy Helegson
Air Safety Investigator
Lycoming Engines
Williamsport, Pennsylvania

C. ACCIDENT SUMMARY

On November 26, 2018, about 1950 mountain standard time, a Mooney M20C airplane, N113TA, impacted terrain about 1/3-mile south of the Santa Fe Municipal Airport (SAF), Santa Fe, New Mexico. The pilot was fatally injured. The airplane was destroyed by impact forces and a post-impact fire. The airplane was registered to Nelson Flying Service and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 positioning flight. Night visual meteorological conditions prevailed, and the flight was not operated on flight plan. The flight originated from the Phoenix Goodyear Airport (GYR), Goodyear, Arizona about 1500 and was destined for the Colorado Plains Airport (AKO), Akron, Colorado.

D. DETAILS OF AIRCRAFT EXAMINATION

An on-scene airframe examination was conducted on November 27 and 28, 2018. The engine was recovered to the Santa Fe Municipal Airport and a post-recovery engine examination was completed on November 29, 2018. The airframe examination was conducted by the NTSB investigator-in-charge (IIC). The engine examination was conducted under direct oversight of the NTSB IIC with the assistance of a technical representative from Lycoming Engines.

Summary of Aircraft Examination

E. DESCRIPTION OF ACCIDENT SITE

The airplane impacted a shallow ravine about one-third mile south of the runway 2 arrival threshold at SAF. An area of charred ground and vegetation extended about 30 feet from the main wreckage. The entire airplane, including the control surfaces, was located at the accident site. The fuselage and empennage were consumed by a post-impact fire. The wings were inverted and located in position relative to the fuselage. The inboard portions of the wings were damaged by the post-impact fire. The engine and propeller were located with the wreckage.

F. SUMMARY OF AIRCRAFT EXAMINATION¹

Airframe – Mooney M20C (s/n 3402)

The fuselage and empennage exhibited extensive deformation consistent with impact and was consumed by the post-impact fire. The engine was separated and located immediately adjacent to the fuselage. Both wings exhibited leading edge crushing damage along the entire spans. The left wing exhibited extensive deformation over the outboard approximate one-third span. The inboard portion of the left wing sustained thermal damage. The left aileron and flap remained partially attached. The right wing exhibited deformation near the wing tip. The right aileron remained attached. The right flap was separated and located at the accident site. The right wing sustained thermal damage and exhibited soot deposits along the leading edge and the inboard one-half of the span. The right wing was located immediately adjacent to the area of fire-damaged ground and vegetation. Portions of the elevators and rudder were present with the wreckage. Both main landing gears were in the retracted position. The nose landing gear had separated and was located near the main wreckage.

The entire flight control system exhibited multiple separations consistent with impact and post-impact thermal damage. No anomalies consistent with a pre-impact failure of the flight control system was observed.

Engine – Lycoming O-360-A1D (s/n L-9745-36A)

Propeller –Hartzell HC-C2YK-1BF (s/n CH-19370)

The engine assembly exhibited damage consistent with impact forces. The crankcase appeared intact and all six cylinders were secured to the crankcase. The intake and exhaust ducting and oil sump were crushed and deformed.

Internal engine continuity was confirmed via crankshaft rotation. Compression and suction were obtained on each cylinder except for cylinder no. 1. The no. 1 cylinder exhaust valve rocker arm was captured in the open position. Borescope examination did not reveal any anomalies consistent with a loss of engine power. All pistons and cylinder valves appeared intact; operating signatures appeared normal. The spark plugs appeared intact and exhibited normal combustion signatures, with exception of the bottom spark plug on the no. 1 cylinder. The bottom, no. 1 spark plug sustained mechanical damage consistent with impact. The oil filter was securely attached to filter adapter; however, the adapter had separated from the engine. The oil filter appeared intact. The oil pickup screen was intact and free of debris.

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

Summary of Aircraft Examination

F. SUMMARY OF AIRCRAFT EXAMINATION *(concluded)*

Both magnetos were separated from the engine and located near the engine at the accident site. The left magneto did not rotate; the right magneto was free to rotate but did not produce any spark. Both sustained extensive thermal damage consistent with the post-impact fire.

The carburetor was separated and located with the engine. Both the throttle and mixture cables were separated at their control arms. The carburetor was disassembled. The fuel inlet screen was clogged with melted rubber. No other anomalies noted. The engine driven fuel pump remained secured to the engine and exhibited thermal damage. A teardown examination revealed that the diaphragm was consumed consistent with the thermal damage. The vacuum pump had separated from and was located with the engine at the accident site. The pump housing appeared to be intact. A teardown examination did not reveal any anomalies; the rotor and vanes were intact. The alternator remained attached to the engine; however, it sustained mechanical damage consistent with impact. A teardown examination did not reveal any anomalies consistent with an inability to provide electrical power. The remainder of the electrical system could not be evaluated due to the post-impact fire damage.

The propeller governor was separated at the engine adapter and located with the engine. Control rod and cable remained secured to the governor. The cable had been cut at fire wall during recovery.

The propeller assembly remained securely attached to the engine, and both propeller blades remained secured to the hub. The hub appeared to be intact. Both blades were bent aft and exhibited extensive chordwise scratches. The spinner was deformed and torn.