

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

SUMMARY OF AIRCRAFT EXAMINATION

-- CEN19FA139 --

A. ACCIDENT

Location: Moose Lake, MN
Date: May 8, 2019
Time: 1630
Aircraft: Mooney M20J

B. PARTICIPANTS

Jennifer Rodi
Senior Aviation Accident Investigator
National Transportation Safety Board

Edward Martin
Aviation Safety Inspector
Federal Aviation Administration

John Butler
Senior Air safety Investigator
Lycoming Engines

C. ACCIDENT SUMMARY

On May 8, 2019, about 1630 central daylight time, a Mooney M20J airplane, N111JP, crashed into Moose Horn River northwest of the Moose Lake Carlton County Airport (KMZH), Moose Lake, Minnesota. The pilot was fatally injured. The airplane sustained substantial damage. The airplane was owned by Club Cherokee, Inc., and operated by a private individual under the provisions of Title 14 *Code of Federal Regulations* Part 91. Instrument meteorological conditions prevailed and a Federal Aviation Administration (FAA) flight plan had been filed for the flight. The business flight was originating at the time of the accident and was en route to Crystal Airport (KMIC), Minneapolis, Minnesota.

D. DESCRIPTION OF ACCIDENT SITE

The airplane came to rest near the west bank of the river in about 2 to 4 ft of water. The engine and propeller were imbedded in the mud and silt on the bank of

Summary of Aircraft Examination

the river and the tail was extended into the air. The fuselage, both wings, empennage and engine and propeller assembly were all located in the river.

E. DETAILS OF AIRCRAFT EXAMINATIONS

The right wing was removed from the airframe for recovery purposes. The right wing included the right aileron, right flap, and right main landing gear. The flight control tube for the right aileron was cut at the wing root for recovery purposes. The tube was impact damaged and full range continuity could not be confirmed. The tip of the right wing was impact separated and the leading edge of the wing exhibited aft accordion-type crush signatures and was rolled up and aft. The right wing flap control tubing was cut for recovery purposes; the right flap appeared to be up or retracted. The right main landing gear was in the wheelwell following recovery. The main landing gear was loose and the position of the landing gear at the time of the accident could not be determined.

The left wing was removed from the airframe for recovery purposes. The left wing included the left aileron, left flap, and left main landing gear. The flight control tube for the left aileron was cut at the wing root for recovery purposes. The tube was impact damaged, impact separated at the aileron, and full range continuity could not be confirmed. The leading edge of the wing exhibited aft accordion-type crush signatures and was rolled up and aft. The left wing flap control tubing was cut for recovery purposes; the left flap appeared to be up or retracted. The left main landing gear was in the wheelwell following recovery. The main landing gear was loose and the position of the landing gear at the time of the accident could not be determined.

The empennage included the horizontal stabilizer, elevator, vertical stabilizer, and rudder. The empennage had been removed from the airframe for recovery purposes. The control tubing for both the elevator and rudder were continuous from the recovery cuts forward to the cabin and aft to the rudder and elevator control surfaces. The control tubes were manipulated by hand and both the rudder and elevator continuity were confirmed free and correct. The forward empennage and fuselage exhibited crushing and buckling to the left. The empennage was otherwise unremarkable. The elevator trim cables were free and correct – no anomalies were noted.

The fuselage included the instrument panel, forward, and aft seats. The skin of the fuselage was wrinkled in all quadrants and the firewall and forward floor of the fuselage were crushed up and aft about 45°. The nosewheel was crushed up and into the lower fuselage. The forward floor of the cabin contained several inches of mud, silt, and vegetation. The instrument panel was impact damaged. The front and pilot-side windscreen were fragmented and separated.

The pilot-side seat was impact separated. The lap belt and shoulder harness were intact and not fastened.

The engine was impact separated. The upper bank of spark plugs, valve covers, magneto, vacuum pump, and fuel pump were removed to facilitate the examination. The No. 1, 2, and 3 exhaust push rods and shrouds were impact separated and were not recovered. The No. 1 intake push rod and shroud were bent up due to recovery damage. The upper bank of spark plugs exhibited rust, and muddy/murky deposits consistent with water emersion. The spark plugs exhibited otherwise normal signatures when compared to a Champion

Summary of Aircraft Examination

Spark-a-Plug chart. The fuel injector nozzles were clear of debris and fuel manifold was clear and the diaphragm was intact.

The engine was rotated through at the propeller; mud and water exited from the engine at each spark plug orifice. Tactile compression was noted on all cylinders and valve train and drive train continuity were confirmed. The dual magneto was sparked using a power drill. Spark was noted at each lead.

The fuel pump was intact, the vent line was impact separated, and when operated by hand exhibited tactile air movement at the inlet side. The vacuum pump remained attached to the engine and the spline was intact. It contained mud and water which precluded rotation by hand. The vanes exhibited wear signatures but were otherwise intact.

The mixture arm was impact separated from the servo. The throttle arm remained intact and attached. The position was unreliable due to impact. The fuel inlet screen was partially impact separated and was free of visible contaminations. The oil pickup screen was clear of visible contaminations.

Both propeller blades remained attached at the hub of the propeller and the propeller assembly remained attached to the engine. Both propeller blades exhibited leading edge polishing and scratches along the face of the blade. Both blades were bent aft slightly. The propeller governor control arm was impact separated and the unit was otherwise unremarkable.

There were no mechanical anomalies with the airframe, engine, or related systems that would have precluded normal operations at the time of the accident.