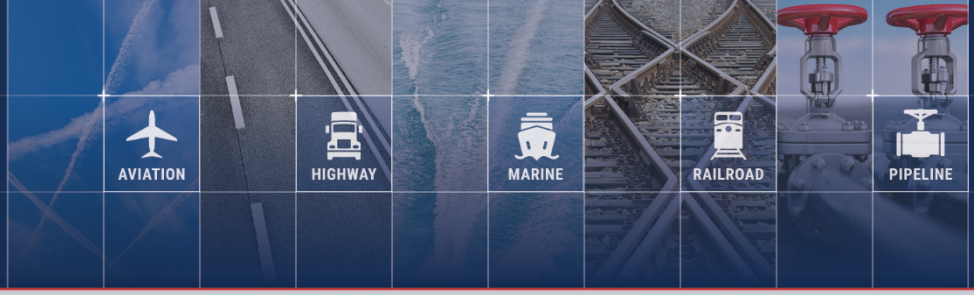


# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Lawrenceburg, Tennessee | **Accident Number:** | NYC08FA298 |
| **Date & Time:** | August 30, 2008, 11:25 Local | **Registration:** | N6480U |
| **Aircraft:** | Mooney M20C | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Loss of engine power (total) | **Injuries:** | 1 Fatal, 1 Serious |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

While approaching the destination airport at the conclusion of a cross country flight, the pilot contacted the fixed based operator via radio and advised that he was approaching the runway. Witnesses observed the airplane maneuvering in the vicinity of the airport, before the engine lost power. The airplane impacted trees and terrain about 1/2-mile northwest of the approach end of the runway. Examination of the wreckage revealed that only trace amounts of fuel remained in both fuel tanks, and within the carburetor float bowl. Fuel staining was observed along the underside of the airplane; however, the origin of the fuel stains could not be determined. No evidence of any other pre-impact mechanical malfunctions or failures were observed. The quantity of fuel onboard the airplane at the time of the departure could not be determined.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to fuel exhaustion.

### Findings

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|---|---|
| **Aircraft** | Fuel - Fluid level |

# Factual Information

## History of Flight

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|---|---|
| **Maneuvering** | Fuel exhaustion |
| **Maneuvering** | Loss of engine power (total) (Defining event) |
| **Maneuvering** | Collision with terr/obj (non-CFIT) |

HISTORY OF FLIGHT

On August 30, 2008, about 1125 central daylight time, a Mooney M20C, N6480U, was substantially damaged when it impacted terrain during a forced landing while approaching Lawrenceburg-Lawrence County Airport (2M2), Lawrenceburg, Tennessee. The certificated private pilot was seriously injured, and the passenger was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which originated at Mason County Airport (3I2), Point Pleasant, West Virginia. The personal flight was conducted under 14 Code of Federal Regulations Part 91.

During an interview, a lineman at 2M2, stated that the accident pilot checked in via radio on the airport common traffic advisory frequency. The lineman then provided the pilot the current altimeter setting and the wind conditions. The pilot stated that he was about 11 miles from the airport, and later stated that he was on final approach for runway 17. The lineman then looked out the window and saw the accident airplane in a “steep” bank over the trees located northwest of the airport. He noted that the airplane’s bank was so steep that he could clearly see its underside. He then lost sight of the airplane behind trees.

Another witness, located about 1 nautical mile north of the accident site, stated that he observed the accident airplane flying overhead, at a position and altitude that was normal for airplanes operating to and from the airport. The airplane was in a bank, and was located west of his position. He then heard the engine “backfire” twice, before it went silent. The airplane then descended toward the southeast before he lost sight of it behind trees.

A third witness, located about 1,400 feet northeast of the accident site, stated that while having a conversation with two other persons, one of the individuals stated, “that plane is going to crash.” She looked up and saw the airplane at an altitude low enough that she could discern that two people were onboard. She also had the impression that the engine was not producing power, or that the power was at a low setting, because it was not making much noise. The airplane was headed toward the airport, but then entered a right turn, before leveling its wings. The airplane then turned right again, momentarily descended vertically downward and “shuddered,” before it turned back toward the direction of the accident site. She then lost sight of the airplane behind terrain, but shortly thereafter, heard the sounds of impact and saw debris flying in the air in the vicinity of the accident site.

## METEOROLOGICAL INFORMATION

The reported weather conditions at Northwest Alabama Regional Airport (MSL), Muscle Shoals, Alabama, located 34 nautical miles southwest of the accident site, at 1153, included calm winds, clear skies, temperature 29 degrees Celsius, dew point 20 degrees Celsius, and an altimeter setting of 30.04 inches of mercury.

## PERSONNEL INFORMATION

The pilot held a private pilot certificate with a rating for airplane single engine land. A review of the pilot's personal logbook revealed that he had accumulated 342 total hours of flight experience, 301 hours of which were logged through 1984, with the balance logged since November 2007. The pilot's most recent flight review was completed on June 11, 1984.

The pilot received a logbook endorsement for the operation of complex aircraft on April 7, 2008. Additionally, the pilot had logged 33 total hours of flight experience in the accident airplane make and model.

The pilot had logged four previous flights from 3I2 to 2M2 since July 3, 2008. Three of those flights were direct, and lasted an average of 2.5 hours each. No logbook entries were found dated after August 8, 2008.

## AIRCRAFT INFORMATION

According to FAA records, the airplane was manufactured in 1962. The airplane's most recent annual inspections were completed on May 29, 2008, for the airframe, and on June 29, 2008 for the engine. At the time of the airframe inspection, it had accumulated 2,514 total hours of operation.

According to fueling records maintained by 2M2, the accident airplane had been serviced four times since July 5, 2008. The following fuel quantities were obtained on the respective dates; 37.1 gallons on July 5, 32.1 gallons on July 19, 8.2 gallons on July 8, and 36.1 gallons on August 19. According to fueling records maintained by 3I2, the pilot serviced the airplane with fuel on August 19, at which time he obtained 25.2 gallons.

## WRECKAGE AND IMPACT INFORMATION

The wreckage was examined at the accident scene on August 31, 2008. All major components of the airplane were accounted for at the scene.

The initial impact point was a tree located about 3,500 feet northwest of the runway 17 threshold. The wreckage path extended from the first tree strike to where the where the airplane came to rest, was about 200 feet long, and was oriented about 300 degrees magnetic.

The initial tree strike was about 30 feet above the ground, and at least three additional tree strikes were noted between the initial tree strike and the wreckage.

About 180 feet from the initial tree strike, was a ground scar about 10 inches in diameter, and about 1 inch deep. The propeller was found separated forward of the propeller flange, and buried face down in the ground about 5 inches deep, and about 6 feet beyond the ground scar, along the wreckage path. An examination of the propeller did not reveal evidence of any leading edge gouging, and there was minimal chordwise scratching, and almost no deformation of the blades.

The airplane came to rest in a corn field, oriented roughly opposite the direction of the wreckage path. The portion of the cabin forward of the instrument panel was deformed and destroyed by impact forces. Both wings exhibited leading edge crush damage to their outboard 1/3 spans, and the right flap was separated from its mounts and lying on the ground. The fuselage displayed deformation just aft of the aft cabin bulkhead, and the empennage was displaced 30 degrees left. Control continuity was confirmed from the rudder, elevator, and ailerons to cabin area just below the instrument panel location.

The wreckage was recovered to Lawrenceburg airport, and when moved, no odor or evidence of fuel spillage was noted at the scene.

An examination of the underside of the fuselage revealed staining running aft from the forward portion of the nose landing gear door, to roughly where the aft portion of the fuselage was deformed. The staining was light blue in color, consistent with 100-octane low lead aviation fuel. The access panel located left of the nose landing gear door also exhibited light and dark blue staining, as did the fuel lines and floor structure located above it. When disassembled, a trace amount of fuel was observed in the electric fuel boost pump, and the fuel strainer was absent of debris. The fuel line forward of the electric boost pump to the engine driven fuel pump was impact damaged, and could not be examined.

Less than 1 cup of 100-octane low lead aviation fuel was drained from the left and right fuel tanks. The tanks were then each filled with approximately 10 gallons of water, and no visible leaks of the tanks were observed.

The carburetor was separated from its mount, and remained attached by the throttle control arm. Once separated, movement of the throttle control arm confirmed operation of the accelerator pump, and fuel emitted from the carburetor jet. Disassembly of the carburetor revealed that both floats were intact and free to move, and the carburetor bowl contained a trace amount of fuel.

The engine was separated from the airframe and shipped to its manufacturer, where it was disassembled and examined. Drivetrain and valvetrain continuity was confirmed by rotation of the crankshaft, and compression was confirmed on all cylinders. Rotation of the left and right magneto input shafts produced spark on all terminal leads. The fuel pump was cycled by hand,

and produced suction at the inlet port and pressure at the outlet port. Examination of the oil suction and pressure screens revealed that small carbon bits were present. No evidence of excessive or unusual wear was noted.

A Garmin 195 handheld global positioning system receiver was recovered from the wreckage and examined in the Safety Board Vehicle Recorders Laboratory, Washington, DC. The examination revealed that it was not recording track log information at the time of the accident.

ADDITIONAL INFORMATION

Review of the Mooney M20C Owner's Manual revealed that between 5,000 and 7,500 feet, fuel burn typically ranged between 12.9 gallons per hour and 9.0 gallons per hour during "best power" cruise. The estimated range at those fuel burns ranged between 597 and 731 nautical miles, with no reserve. The airplane had a total usable fuel capacity of 48 gallons.

The distance between 3I2 and 2M2 was 331 nautical miles.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 61,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 3 With waivers/limitations | **Last FAA Medical Exam:** | March 17, 2008 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | June 11, 1984 |
| **Flight Time:** | 342 hours (Total, all aircraft), 33 hours (Total, this make and model), 273 hours (Pilot In Command, all aircraft), 19 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | Mooney | **Registration:** | N6480U |
| **Model/Series:** | M20C | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 2383 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | May 29, 2009 Annual | **Certified Max Gross Wt.:** | 2575 lbs |
| **Time Since Last Inspection:** | 24 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 2514 Hrs as of last inspection | **Engine Manufacturer:** | Lycoming Engines |
| **ELT:** | Installed | **Engine Model/Series:** | O-360 |
| **Registered Owner:** | On file | **Rated Power:** | 180 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | MSL,550 ft msl | **Distance from Accident Site:** | 34 Nautical Miles |
| **Observation Time:** | 11:53 Local | **Direction from Accident Site:** | 240° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.04 inches Hg | **Temperature/Dew Point:** | 29°C / 20°C |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | Point Pleasant, WV (3I2 ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Lawrenceburg, TN (2M2 ) | **Type of Clearance:** | None |
| **Departure Time:** | | **Type of Airspace:** | |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Serious | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 1 Fatal | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Fatal, 1 Serious | **Latitude, Longitude:** | 35.249721,-87.249168 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Diaz, Dennis |
| **Additional Participating Persons:** | Tim Allen; FAA/FSDO; Nashville, TN<br>Gregory Erikson; Lycoming Engines; Williamsport, PA |
| **Original Publish Date:** | September 30, 2009 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=68833 |

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.