



# Aviation Investigation Final Report

<b>Location:</b>	Dawson, Georgia	<b>Accident Number:</b>	ERA21LA222
<b>Date &amp; Time:</b>	May 20, 2021, 09:30 Local	<b>Registration:</b>	N9514R
<b>Aircraft:</b>	MOONEY AIRCRAFT CORP. M20K	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 Serious
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot reported that, while en route to the destination airport, the airplane lost total engine power. The pilot declared an emergency with air traffic control and began to divert to the nearest airport. The pilot recognized that the airplane would not be able to glide to the airport, and he decided to land on a road with the landing gear and flaps retracted. The pilot and passenger sustained serious injuries, and the airplane was substantially damaged.

A postaccident teardown examination of the engine revealed that the No. 4 connecting rod was fractured midspan. One of the No. 4 connecting rod bolt nuts was found in the oil pan and exhibited no signs of pre- or postaccident damage. The cotter pin for that nut was not found; the other No. 4 connecting rod nut was found secured to its bolt with the cotter pin installed. Additionally, all other connecting rod bolt nuts remained attached to their respective bolts with cotter pins in place. Thus, it is likely that the nut found in the oil pan was not secured with a cotter pin and that the unsecured No. 4 connecting rod bolt nut became loose over time and backed out of the connecting rod bolt during the accident flight, resulting in the total loss of engine power.

Review of maintenance records revealed that the engine had accumulated about 1,240 hours of operation since major overhaul, which was completed more than 28 years before the accident. The engine manufacturer recommended that the engine be overhauled every 2,000 hours or 12 calendar years, whichever occurred first. The investigation could not determine when the No. 4 connecting rod nut was installed without a cotter pin.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Maintenance personnel's failure to properly secure the No. 4 connecting rod bolt nut with a cotter pin, resulting in a total loss of engine power.

**Findings**

**Personnel issues**

Replacement - Maintenance personnel

**Aircraft**

Recip engine power section - Incorrect service/maintenance

## Factual Information

### History of Flight

Enroute	Loss of engine power (total) (Defining event)
Enroute	Off-field or emergency landing
Enroute	Collision with terr/obj (non-CFIT)

On May 20, 2021, about 0930 eastern daylight time, a Mooney M20K, N9514R, was substantially damaged when it was involved in an accident near Dawson Municipal Airport (16J), Dawson, Georgia. The pilot and passenger sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he had recently purchased the airplane. On the day of the accident, the pilot conducted a preflight inspection with no anomalies noted, and the airplane departed Orlando Apopka Airport (X04), Apopka, Florida, about 0815 for a flight to Birmingham-Shuttlesworth International Airport (BHM), Birmingham, Alabama. While en route to the destination airport, the airplane lost total engine power. The pilot declared an emergency to air traffic control and diverted to the nearest airport, which was 16J. During the descent, the pilot operated the engine controls with no response from the engine. The pilot realized that the airplane would not reach the airport, and he landed the airplane on a road with the landing gear and flaps retracted. The airplane's right wing and fuselage were substantially damaged.

A postaccident teardown examination revealed two holes in the top of the engine crankcase, with the larger hole near the center and the smaller hole just aft. The cylinders remained attached to the crankcase. The No. 4 connecting rod was found fractured about midspan. A No. 4 connecting rod bolt nut was found in the oil pan. This nut exhibited no signs of impact damage or damage that would be consistent with separation. A cotter pin associated with the nut was not located. The other No. 4 connecting rod nut was found secured to its bolt with the cotter pin installed. All other connecting rod bolt nuts remained attached to their respective bolts with cotter pins in place. The oil filter pleats and oil sump contained a large amount of metallic debris.

Review of maintenance records revealed that the engine had accumulated about 1,240 hours of operation since its last major overhaul, which was completed on September 18, 1992. The engine manufacturer recommended that the engine be overhauled every 2,000 hours or 12 calendar years, whichever occurred first. Further review of the records revealed that the engine was disassembled, cleaned, and inspected due to a crankcase crack in 2005 and that the No. 3 cylinder was replaced in 2013.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	69, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	April 26, 2021
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	March 2, 2021
<b>Flight Time:</b>	1030 hours (Total, all aircraft), 25 hours (Total, this make and model), 1030 hours (Pilot In Command, all aircraft), 19 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Passenger Information

<b>Certificate:</b>		<b>Age:</b>	Female
<b>Airplane Rating(s):</b>		<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>		<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	MOONEY AIRCRAFT CORP.	<b>Registration:</b>	N9514R
<b>Model/Series:</b>	M20K	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1980	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	25-0484
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	May 27, 2020 100 hour	<b>Certified Max Gross Wt.:</b>	2900 lbs
<b>Time Since Last Inspection:</b>	25.8 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	3575.7 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	TSIO 360 GB1
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	210 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	ABY,193 ft msl	<b>Distance from Accident Site:</b>	21 Nautical Miles
<b>Observation Time:</b>	09:53 Local	<b>Direction from Accident Site:</b>	131°
<b>Lowest Cloud Condition:</b>	Few / 2800 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	17 knots / 23 knots	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	110°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.31 inches Hg	<b>Temperature/Dew Point:</b>	26°C / 16°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Apopka, FL (X04)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Birmingham, AL (BHM)	<b>Type of Clearance:</b>	VFR flight following
<b>Departure Time:</b>	08:15 Local	<b>Type of Airspace:</b>	Class E

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Serious	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Serious	<b>Latitude, Longitude:</b>	31.771412,-84.50667

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Young, Joshua
<b>Additional Participating Persons:</b>	Steven Davidson; FAA - FSDO; Atlanta, GA Danny Cox; FAA - FSDO; Atlanta, GA
<b>Original Publish Date:</b>	June 22, 2023
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=103119">https://data.ntsb.gov/Docket?ProjectID=103119</a>

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](#).