

Aviation Investigation Final Report

Location: Minneola, Florida Accident Number: ERA19FA256

Date & Time: August 23, 2019, 11:15 Local Registration: N9143M

Aircraft: MORIARTY MARVIN AVENTURA II Aircraft Damage: Substantial

Defining Event: Loss of engine power (partial) **Injuries:** 1 Fatal

Flight Conducted Under: Part 91: General aviation - Personal

Analysis

According to the pilot's son, he and his father were working on the experimental, amateur-built airplane's carburetor the day before the accident to improve the fuel consumption. They replaced the carburetor jets with smaller ones, but that change made the engine run roughly. On the morning of the accident, the pilot told his son that he fixed the airplane by adjusting the carburetor float tabs, allowing more fuel to enter the carburetor bowl. They then performed an engine run-up, and it ran normally. The pilot's son stated that, during takeoff, the airplane was not climbing like it had in the past. When the airplane reached about 300 ft above ground level, the engine started to sputter and run roughly. He stated that it looked like his father tried to turn the airplane back to the runway and made a sharp left turn but that shortly after the turn, the airplane descended straight down to the ground.

Postaccident examination of the engine found that the choke on the carburetors was safety wired in the open position. The top spark plugs were removed and noted to be black and sooty, consistent with the engine running with an excessively rich fuel ratio. No other mechanical anomalies were noted with the engine that would have precluded normal operation. Given the available information, it is likely that the pilot's modifications to the airplane's engine resulted in it running excessively rich, which resulted in the partial loss of power and engine roughness that occurred during the takeoff. Additionally, the pilot exceeded the airplane's critical angle of attack while attempting to return to the airport, which led to an aerodynamic stall and impact with terrain.

Toxicological testing revealed Delta-9-THC (tetrahydrocannabinol, the active compound in marijuana) in the pilot's blood and liver specimens; however, it could not be determined if the pilot's marijuana use impacted his behavior or decision making before or during the accident flight.

Probable Cause and Findings

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

The pilot's improper modifications to the airplane's engine, which resulted in the partial loss of engine power. Contributing to the outcome was the pilot's exceedance of the airplane's critical angle of attack during an attempted return to the airport following a partial loss of engine power, which resulted in an aerodynamic stall and impact with terrain.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Angle of attack - Capability exceeded
Personnel issues	Modification/alteration - Pilot
Aircraft	Fuel control/carburetor - Incorrect service/maintenance

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Factual Information

History of Flight

Prior to flight Aircraft maintenance event

Initial climb Loss of engine power (partial) (Defining event)

Emergency descent Loss of control in flight

Uncontrolled descent Collision with terr/obj (non-CFIT)

On August 23, 2019, about 1115 eastern daylight time, an experimental amateur-built Aventura II airplane, N9143M, was substantially damaged when it was involved in an accident near Minneola, Florida. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot's son, he and his father had assembled the airplane. He stated that they had installed an after-market supercharger on the engine several months before the accident, and the airplane had been flying well since then. He further stated that, about 2 days before the accident, his father said the airplane had been consuming fuel at a higher-than-normal rate (about 6 gallons per hour as opposed to the normal 4 gallons per hour). On the day before the accident, he and his father replaced the jets in the carburetor with smaller jets to attempt to improve the fuel consumption. After they replaced the jets, they started the engine, and it was running roughly (coughing and missing).

The pilot's son stated that the next morning, when he arrived at Florida Flying Gators Airport (3FD4), Minneola, Florida, his father told him he had fixed the airplane by adjusting the tabs on the carburetor float bracket and allowing more fuel to enter the carburetor bowl. They performed a run-up of the engine, and it ran normally. He stated that his father planned to fly to DeLand Municipal Airport-Sidney H Taylor Field (DED), DeLand, Florida, and that he would drive a truck and trailer there to meet him. He watched his father start his takeoff roll on runway 36. He stated that the takeoff looked normal but that the airplane was not climbing like it had in the past. When the airplane reached about 300 ft above ground level, the engine started to sputter and run roughly. He stated that it looked like his father tried to turn back to the runway and made a sharp left turn but that shortly after the left turn, the airplane descended straight down to the ground.

The airplane came to rest about 200 yards from the end of runway 36. The wreckage was oriented on a 270° magnetic heading, and all major components were located with the main wreckage. Flight control continuity was verified from the cockpit to all primary flight control surfaces.

Examination of the wreckage revealed that the airplane impacted the ground in an almost vertical nosedown attitude. The nose of the airplane was fractured in several pieces, and the instrument panel was destroyed; the instruments were found in the grass beside the main wreckage. The landing gear was extended. The wing was impact damaged, and the fabric was torn down the entire length of the wing. The aluminum tubing inside the wing structure was fractured off and had torn through the wing fabric

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material. The engine was fractured off the engine mounts and remained connected through the wiring and cables from the throttle and mixture controls. The engine was found inverted, and automotive gasoline was pouring out of the fractured fuel lines. The three-blade composite propeller remained attached to the engine, and one propeller blade was fractured mid-blade by impact forces. Both carburetors were fractured off the induction system and connected by only the throttle linkage. The tail section of the airplane did not contact the ground and was undamaged.

Further examination of the engine found that the choke on the carburetors was safety wired in the open position. The right exhaust gas temperature probe was cut off at the exhaust pipe. A new temperature probe was drilled into the exhaust pipe and clamped to the pipe with two worm-style, stainless-steel clamps. The supercharger spun freely, and no binding was noted. The top spark plugs were removed and noted to be black and sooty from exhaust gases. Thumb compression was established on all cylinders. A lighted boroscope was used to examine the cylinders, valves, and pistons; no anomalies were noted.

The pilot had reported 306 total flight hours to the Federal Aviation Administration (FAA) at the time of his most recent medical examination but had reported no chronic medical conditions and no use of medications.

According to the autopsy performed by the State of Florida Medical Examiner, Districts 5 & 24, the pilot's cause of death was multiple blunt force injuries. No significant natural disease was identified.

Toxicology testing performed by NMS Labs identified 5.8 ng/mL of Delta-9-THC (tetrahydrocannabinol, the active compound in marijuana) and 15 ng/mL of its inactive metabolite, Delta-9-Carboxy-THC, in the pilot's iliac blood.

Toxicology testing performed by the FAA's Forensic Science Laboratory identified 7.4 ng/mL of Delta-9-THC in the pilot's cavity blood, along with 16.4 ng/mL of Delta-9-Carboxy-THC and 0.9 ng/mL of 11-Hydroxy-Delta-9-THC (a psychoactive metabolite). In addition, 3 ng/ml of Delta-9-THC was identified in liver tissue, along with 107.8 ng/mL of Delta-9-Carboxy-THC. Testing for 11-Hydroxy-Delta-9-THC was inconclusive in liver tissue.

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Pilot Information

Certificate:	Private	Age:	63,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	October 15, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	October 16, 2018
Flight Time:	379 hours (Total, all aircraft), 70.5 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	MORIARTY MARVIN	Registration:	N9143M
Model/Series:	AVENTURA II	Aircraft Category:	Airplane
Year of Manufacture:	2001	Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	AP2A0093
Landing Gear Type:	Retractable - Tailwheel	Seats:	2
Date/Type of Last Inspection:	April 1, 2019 Condition	Certified Max Gross Wt.:	1433 lbs
Time Since Last Inspection:	50 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	870.7 Hrs at time of accident	Engine Manufacturer:	ROTAX
ELT:	C91A installed, not activated	Engine Model/Series:	912ULS
Registered Owner:	On file	Rated Power:	150 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

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Meteorological Information and Flight Plan

Visual (VMC)	Condition of Light:	Day
KORL,112 ft msl	Distance from Accident Site:	25 Nautical Miles
15:15 Local	Direction from Accident Site:	102°
Clear	Visibility	10 miles
None	Visibility (RVR):	
3 knots /	Turbulence Type Forecast/Actual:	None / None
30°	Turbulence Severity Forecast/Actual:	N/A / N/A
30.1 inches Hg	Temperature/Dew Point:	30°C / 23°C
No Obscuration; No Precipitation		
Minneola, FL (3FD4)	Type of Flight Plan Filed:	None
Deland, FL (DED)	Type of Clearance:	None
11:15 Local	Type of Airspace:	
	KORL,112 ft msl 15:15 Local Clear None 3 knots / 30° 30.1 inches Hg No Obscuration; No Precipitat Minneola, FL (3FD4) Deland, FL (DED)	KORL,112 ft msl Distance from Accident Site: 15:15 Local Direction from Accident Site: Clear Visibility None Visibility (RVR): 3 knots / Turbulence Type Forecast/Actual: 30° Turbulence Severity Forecast/Actual: 30.1 inches Hg Temperature/Dew Point: No Obscuration; No Precipitation Minneola, FL (3FD4) Type of Flight Plan Filed: Deland, FL (DED) Type of Clearance:

Airport Information

Airport:	Florida Flying Gators 3FD4	Runway Surface Type:	Grass/turf
Airport Elevation:	30 ft msl	Runway Surface Condition:	Dry
Runway Used:	36	IFR Approach:	None
Runway Length/Width:	2000 ft / 70 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	28.630556,-81.804443(est)

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Administrative Information

Investigator In Charge (IIC): Additional Participating Persons: Original Publish Date: June 1, 2021 Last Revision Date: Investigation Class: Class 3 Note: The NTSB traveled to the scene of this accident. Investigation Docket: https://data.ntsb.gov/Docket?ProjectID=100123		
Persons: Original Publish Date: June 1, 2021 Last Revision Date: Investigation Class: Class 3 Note: The NTSB traveled to the scene of this accident.	Investigator In Charge (IIC):	Boggs, Daniel
Last Revision Date: Investigation Class: Class 3 Note: The NTSB traveled to the scene of this accident.		Ariel Rodgigues; FAA; Orlando, FL
Investigation Class: Note: Class 3 The NTSB traveled to the scene of this accident.	Original Publish Date:	June 1, 2021
Note: The NTSB traveled to the scene of this accident.	Last Revision Date:	
	Investigation Class:	Class 3
Investigation Docket: https://data.ntsb.gov/Docket?ProjectID=100123	Note:	The NTSB traveled to the scene of this accident.
ps//satamos_go//2001011-10joot2	Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100123

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.

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