



National Transportation Safety Board Aviation Accident Final Report

Location:	Ama, LA	Accident Number:	CEN15FA426
Date & Time:	09/26/2015, 1222 CDT	Registration:	N401
Aircraft:	JONES RALPH D ZODIAC CH 601 HD	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The private pilot was conducting a local flight in the experimental, amateur-built airplane. GPS data indicated that, during the takeoff roll, the airplane had a maximum groundspeed of 84 knots. The groundspeed varied between 45 and 96 knots as the airplane turned to a southwesterly heading after departure. About 1 minute 18 seconds after takeoff, the airplane made a right turn toward the northwest. The last recorded data point showed the airplane at an altitude of 66 ft and a groundspeed of 15 knots. When the airplane failed to return to the airport, a search was initiated. The wreckage was found the next day. The airplane impacted terrain in a thickly wooded area in an 80°-nose-down attitude. The airplane's nose section was skewed to the right, the right wing was leading, the left wing was trailing, and the empennage was bent down to the left, consistent with the airplane being in a left spin following an aerodynamic stall.

Examination of the propeller assembly revealed indications of little or no rotation at impact. An engine examination revealed no mechanical malfunctions or failures that would have precluded normal operation. The weather conditions were conducive to serious icing at glide power, but the airplane was operating at takeoff power. Therefore, it cannot be said with certainty that the carburetor accumulated ice and caused a loss of engine power. Based on the GPS data and wreckage examination, it is likely that the pilot failed to maintain adequate airspeed and exceeded the airplane's critical angle of attack following a loss of engine power for reasons that could not be determined based on available evidence, which resulted in an aerodynamic stall and subsequent left spin.

The pilot's autopsy identified significant coronary artery stenosis and evidence of a previous heart attack. The pilot's previous heart attack and significant coronary artery stenosis placed him at risk for an acute cardiac event such as an arrhythmia or ischemia that would have caused chest pain, shortness of breath, palpitations, or fainting. If such an event occurred, the acuteness of the accident would have precluded identifying evidence of it at autopsy. Although acute incapacitation could have occurred, this investigation was unable to determine whether

the pilot's cardiovascular disease contributed to the accident. Additionally, the evidence of a loss of engine power does not support a medically incapacitating event.

Probable Cause and Findings

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

The pilot's failure to maintain adequate airspeed and his exceedance of the airplane's critical angle of attack following a loss of engine power for reasons that could not be determined based on available evidence, which resulted in an aerodynamic stall and left spin.

Findings

Aircraft	Airspeed - Not attained/maintained (Cause) Angle of attack - Capability exceeded (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Predisposing condition - Pilot
Environmental issues	Conducive to carburetor icing - Effect on equipment
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

History of Flight

Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On September 26, 2015, at 1222 central daylight time, an amateur-built Zodiac CH 601 HD airplane, N401, impacted terrain near St. Charles Airport (LS40), Ama, Louisiana. The pilot was fatally injured, and the airplane was substantially damaged. The airplane was registered to Buffalo RD, LLC, and was operated by the pilot as a 14 *Code of Federal Regulations* Part 91 personal flight. Day visual meteorological conditions existed near the accident site about the time of the accident, and no flight plan had been filed. The local flight originated from LS40 at 1221.

According to GPS data downloaded from a Garmin Aera 500 GPS located in the wreckage, the airplane began its takeoff roll on runway 17 at LS40 at 1221:18. The maximum groundspeed during the takeoff roll was 84 knots. After takeoff, the groundspeed varied between 45 and 96 knots as the airplane turned to a southwesterly heading. At 1222:32, the airplane made a right turn toward the northwest. At 1222:37, the last recorded data point, the airplane was at 66 ft GPS altitude at a groundspeed of 15 knots. LS40 field elevation is 13 ft. When the airplane failed to return to the airport, a search was initiated. The wreckage was found the next day about 1300.

Pilot Information

Certificate:	Private	Age:	56, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Gyroplane	Restraint Used:	None
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:	12/01/2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	170 hours (Total, all aircraft)		

The pilot held a private pilot certificate with airplane single-engine land and gyroplane ratings. He held a Federal Aviation Administration third-class airman medical certificate, dated December 1, 2014, which contained the restriction, "must wear corrective lenses." The pilot's flight logbook was not located. The pilot did not report his flight time on his most recent

application for his medical certificate; however, on a 1987 application for a medical certificate, the pilot reported he had logged an estimated 170 total flight hours.

Aircraft and Owner/Operator Information

Aircraft Make:	JONES RALPH D	Registration:	N401
Model/Series:	ZODIAC CH 601 HD	Aircraft Category:	Airplane
Year of Manufacture:	2002	Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	6-3106
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	06/09/2015, Condition	Certified Max Gross Wt.:	1200 lbs
Time Since Last Inspection:	3 Hours	Engines:	1 Reciprocating
Airframe Total Time:	1387 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	C91A installed, not activated	Engine Model/Series:	O-235-C1
Registered Owner:	BUFFALO RD LLC	Rated Power:	108 hp
Operator:	On file	Operating Certificate(s) Held:	None

Zodiac Aircraft manufactured the airplane, serial number 6-3106, in kit form, and it was assembled in 2002. It was powered by a 65-horsepower Lycoming O-235-C1 engine, serial number 5544-15, and was equipped with a Warp Drive 3-bladed, fixed-pitch composite propeller. The propeller had been trimmed from 72 to 70.5 inches to increase static rpm to 2,750.

Maintenance records indicated that the airframe's last conditional inspection was completed on June 9, 2015, at a tachometer time of 1,384.9 hours. At the accident site, the tachometer read 1,387.5 hours.

The engine received a field overhaul on January 18, 1965, and was installed in the airplane on May 22, 2012. At the time of the accident it had accrued 227.73 total hours and 72.77 hours since the overhaul. The engine's last 100-hour inspection was completed on June 9, 2015, at a tachometer time of 1,384.9 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KMSY, 4 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	1153 CDT	Direction from Accident Site:	37°
Lowest Cloud Condition:	Few / 3000 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 12000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	30°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	27° C / 21° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ama, LA (LS40)	Type of Flight Plan Filed:	None
Destination:	Ama, LA (LS40)	Type of Clearance:	None
Departure Time:	1221 CDT	Type of Airspace:	Class G

The closest official weather reporting station was at Louis Armstrong New Orleans International Airport (MSY), New Orleans, Louisiana, about 3 miles northeast from the accident location. At 1153, the MSY Automated Surface Observing System reported wind from 030° at 9 knots; visibility 10 miles; few clouds at 3,000 ft; ceiling 12,000 ft broken, 20,000 ft overcast; temperature 27°C, dew point 21°C; and an altimeter setting 29.97 inches of mercury.

A review of the Carburetor Icing Probability Chart indicated the temperature and dew point about the time of the accident near the accident site were conducive to "serious icing at descent power."

Airport Information

Airport:	ST CHARLES (LS40)	Runway Surface Type:	Grass/turf
Airport Elevation:	13 ft	Runway Surface Condition:	Dry
Runway Used:	17	IFR Approach:	Unknown
Runway Length/Width:	3900 ft / 125 ft	VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	29.944444, -90.285278 (est)

The airplane wreckage was found in a thickly wooded area less than .25 miles southwest of the departure end of runway 17 at LS40. Tree branches directly above the wreckage were broken, and the airplane struck the ground in about an 80°-nose-down attitude, as evidenced by damage to the wreckage and broken tree branches. The engine was skewed to the right with the right wing leading and the left wing trailing. The empennage was bent down to the left. The three-blade composite propeller remained attached to the engine. Two blades were intact. The third blade was broken off and located near the engine. All major airplane components and flight control surfaces were accounted for at the accident site.

Medical And Pathological Information

The St. Charles Parish Coroner's Office, Luling, Louisiana, conducted an autopsy of the pilot. According to the autopsy report, the pilot's cause of death was "multiple blunt force injuries, atherosclerotic cardiovascular disease". The autopsy identified 60% narrowing of the left anterior descending coronary artery, a transmural infarct (scar from an old heart attack) in the left ventricle, and no obvious recent infarcts (damage).

The FAA's Bioaeronautical Sciences Research Laboratory conducted toxicology testing on specimens from the pilot. Results were negative for all substances tested for.

Tests And Research

Emergency Locator Transmitter.

An Ameri-King Corporation AK-450 Emergency Locator Transmitter (ELT), S/N 499-664, was recovered from the wreckage and examined for functionality. The ELT was designed to transmit an emergency signal on 121.5/243 Mhz when activated. The recovered ELT passed all functional test during the examination and no anomalies were noted. Cospas-Sarsat Satellite monitoring for 121.5/243 Mhz was terminated in 2009. As such, ELTs broadcasting on 121.5/243 Mhz rely on reception by nearby aircraft or search and rescue personnel.

Engine and Airframe Examination.

The engine was rotated by turning the propeller. Continuity was confirmed from the crankshaft to the rear gears and to the valve train. Compression and suction were observed from all four cylinders. The interiors of the cylinders were examined using a lighted borescope and no anomalies were noted.

A review of copies of airframe and engine logbooks revealed the engine was last overhauled on 01/18/1965. It was installed on the accident aircraft on the accident aircraft on 05/22/2012 with 72.77 hours since that overhaul and had accumulated a total of 227.73 hours time in service and more than 50 calendar years since overhaul at the time of the accident.

The engine was equipped with a Warp Drive 3-blade composite propeller, S/N T7872. The propeller spinner was fragmented. The propeller and two propeller blades remained attached to the crankshaft flange. The remaining propeller blade was separated from the hub at the blade root.

The carburetor air box was impact damaged and the position of the carburetor heat valve undetermined. The carburetor heat knob in the cockpit was in a full forward position. The carburetor remained attached to the engine. The throttle and mixture control cables were impact damaged. The throttle cable remained attached to the carburetor throttle control arm and the arm was observed in a full throttle position. There were two controls labeled "throttle" in the cockpit. The left control was over extended aft. The right control was full forward. The mixture control cable remained attached to the carburetor mixture control arm. The arm was observed in a full lean position. The cockpit mixture control knob was fully forward.

The carburetor was removed and partially disassembled. No damage was noted to the carburetor internal components. A few drops of liquid were observed in the carburetor fuel bowl. The liquid had an odor consistent with aviation fuel. A check of the liquid with water finding paste was negative for water. The carburetor fuel inlet screen was unobstructed. The aircraft fuel strainer/gascolator bowl was separated and found among the wreckage. The fuel screen was not observed.

The aircraft fuselage fuel tank was partially crushed and empty. The tank on/off valve and screen assembly was removed. Debris was observed on the outer surface of the screen. A hole was observed in the screen mesh. A fuel vent tube was observed in the upper corner of the fuel tank. No hose was attached to the tube and a bolt was observed driven into the tube, obstructing the opening. The fuel tank cap appeared to be an automotive type "screw on" oil cap drilled for a float and rod type fuel level indicator. The float was observed about 1/2 full of liquid. The liquid from the float was not examined.

The left magneto was impact separated from the engine. The right magneto mounting flange was fractured and it remained partially attached to the engine. Both magnetos produced spark from all ignition towers when rotated by hand.

The starter was impact fractured and separated from the engine. The alternator remained attached to the engine and no damage was noted. The alternator belt remained in place. Oil was observed in the engine. No debris was observed in the engine oil screen.

No mechanical malfunctions or failures were noted with the engine or airframe that would have precluded normal operation.

Additional Information

Lycoming Engines Service Instruction 1009AW states the following:

Engine deterioration in the form of corrosion (rust) and the drying out and hardening of composition materials such as gaskets, seals, flexible hoses and fuel pump diaphragms can occur if an engine is out of service for an extended period of time. Due to the loss of a protective oil film after an extended period of inactivity, abnormal wear on soft metal bearing surfaces can occur during engine start. Therefore, all engines that do not accumulate the hourly period of TBO [time between overhaul] specified in this publication are recommended to be overhauled in the twelfth year.

Administrative Information

Investigator In Charge (IIC):	Thomas Latson	Report Date:	07/12/2017
Additional Participating Persons:	Dean O Johnson; FAA Baton Rouge FSDO; Baton Rouge, LA J M Childers; Lycoming Engines; Williamsport, PA		
Publish Date:	07/12/2017		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92063		

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