Aviation Investigation Final Report

Location:	Lewisburg, Tennessee	**Accident Number:**	NYC08LA185
Date & Time:	May 17, 2008, 12:59 Local	**Registration:**	N26975
Aircraft:	Gulfstream American Corp. AA-5A	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	3 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that the accident flight was the airplane's first flight since completion of an annual inspection. He performed a preflight inspection and engine run-up, and reported that all gauges were "in the green." During the takeoff roll, the pilot stated that the engine felt "strong." The airplane rotated normally; however, at an altitude of 150 feet above ground level (agl), the engine began to sputter and lose power. Unable to maintain altitude, the pilot began a turn back to the runway. During the turn the airplane entered a stall/spin and collided with terrain at the end of the runway. A witness observed a trail of black smoke coming from the airplane's exhaust during the takeoff sequence. Postaccident examination of the engine and carburetor did not reveal the cause for the loss of power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A partial loss of engine power for an undetermined reason during the initial climb, and the pilot's failure to maintain adequate airspeed while attempting to return to the airport resulting in an aerodynamic stall.

Findings

Not determined	(general) - Unknown/Not determined
Aircraft	Airspeed - Not attained/maintained

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Maneuvering	Aerodynamic stall/spin

HISTORY OF FLIGHT

On May 17, 2008, at 1259 central daylight time, a Gulfstream American Corp. AA-5A, N26975, was substantially damaged during a forced landing, following a loss of engine power while departing Ellington Airport (LUG), Lewisburg, Tennessee. The certificated private pilot and the two passengers received minor injuries. The flight was operated as a personal flight under the provisions of 14 Code of Federal Regulations Part 91, and no flight plan was filed. Visual meteorological conditions prevailed at the time of the accident.

The pilot reported that the accident flight was the airplane's first flight since completion of its annual inspection. He performed a preflight inspection, which included draining fuel from both wing fuel tanks and the gascolator. The pilot then started the engine and taxied the airplane to the ramp. While on the ramp, he stopped the airplane to check the weather and allow the engine to warm to its normal operating temperature. He reported leaning the fuel mixture during this period. He then proceeded to taxi to the run-up area and performed a run-up, with all gauges, "in the green."

Prior to takeoff, the pilot confirmed that the magneto switch was set to the "both" position, the engine mixture control was set to the full rich position, and the electric auxiliary fuel pump was on.

The pilot reported that during the takeoff roll from runway 20, the engine felt "strong." The airplane rotated normally, however, at an altitude of 150 feet above ground level (agl), the engine began to "sputter" and lose power. Unable to maintain altitude, he elected to begin a turn back to the runway. Concerned he would not make it back to the runway, he attempted to land in a grass area to the south. During the landing, the airplane's left wing "dropped" and collided with terrain.

A witness, who was also a pilot, was standing at the departure end of runway 20 and observed the accident airplane during the takeoff climb. He stated that his attention was drawn to the airplane due to an unusual engine sound. He estimated the airplane was at an altitude of 150 feet agl and that it was not gaining altitude. He observed a trail of black smoke coming from the airplane's exhaust. He then observed the left wing drop, and the airplane descend. He reported that the left wing collided with the ground and the airplane began to "cartwheel."

PERSONNEL INFORMATION

The pilot, age 61, held a private pilot certificate, with ratings for airplane single-engine land and instrument airplane. He reported 989 total hours of flight experience since December 1981, 684 hours of which were in the accident airplane type. He reported 20 hours of flight experience in the preceding 90 days prior to the accident.

AIRCRAFT INFORMATION

The four-seat, low-wing, fixed-gear airplane was manufactured in 1979. It had accrued a total time in service of 1,533 hours at the time of the accident. Review of the airplane maintenance records documented that an airframe and engine annual inspection was completed on March 7, 2007. In a written statement, the mechanic who performed this inspection reported that an annual inspection was also completed on May 3, 2008 and that he had not completed logbook entries for this inspection. The pilot reported that this was the first flight since the May 2008 inspection was completed. The Lycoming O-320-E2G, 150-horsepower engine had accumulated a total time in service of 1,533 hours. The engine had accrued 38 flight hours since the most recent major overhaul, which was performed in November 2006.

METEOROLOGICAL INFORMATION

The closest official weather observation station was Smyrna Airport (MQY), Smyrna, Tennessee, located 33 nautical miles northeast of the accident site. The elevation of the weather observation station was 543 feet mean sea level (msl). An aviation routine weather report for MQY was issued at 1256. It stated: winds from 200 degrees at 12 knots, gusting to 16 knots; visibility 10 miles; skies clear; temperature 24 degrees Celsius; dew point 12 degrees Celsius; altimeter 29.90 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane was examined at the accident site by a Federal Aviation Administration (FAA) inspector. According to the inspector, control continuity was confirmed for all control surfaces and engine controls. The inspector also confirmed valve train continuity and did not detect any internal mechanical anomalies with the engine. Blue-colored fuel was observed in both wing tanks, and the throttle, mixture, and carburetor heat engine controls were in the full forward position. The engine fuel primer valve was closed and locked, and the fuel selector valve was set to the right tank. The inspector did not observe any obstructions in the air induction system. The spark plugs were removed and black sooting was observed. Both magnetos were rotated and produced sparks at their respective terminals.

The FAA inspector removed and disassembled the Marvel Schebler MA-4SPA carburetor, observed fuel in the bowl, and reported that the carburetor appeared to be functioning correctly.

TESTS AND RESEARCH

The disassembled carburetor was inspected at Pacific Continental Engines Inc. of Pacoima, California under the supervision of the National Transportation Safety Board investigator-in-charge (IIC). Engine logbook records revealed that the carburetor was overhauled and installed with the overhauled engine in 2006. Impact damage was observed to the accelerator pump check valve housing. The carburetor was fitted with a brass type float assembly, manufactured by Consolidated Fuel Systems, part number CF 30-766, and date stamp 9-98. The float assembly did not exhibit any leaks, abrasions or wear marks. The float valve and seat were clean and free of wear and contaminants. Fuel staining was observed inside the lower throttle body air inlet below the fuel bowl parting surface. A rotational scratch was observed inside the fuel bowl, adjacent to the float lever shaft cotter pin. The cotter pin was inspected and was noted to be bent such that its pivot radius was smaller than the scratches observed on the bowl. The float pontoon height was measured, and noted to be 1/4 inches on one side and 15/64 inches on the other.

A review of the carburetor manufacturer's service manual revealed that the dimension of float height should be 7/32 inches for each pontoon.

The carburetor was re-assembled and a float valve and seat test was performed in accordance with the service manual. During the test the fuel level was observed to rise past the level of the parting surfaces and out of the nozzle. The manual states that this result is not consistent with the normal operation of the float system.

Pilot Information

Certificate:	Private	**Age:**	61,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	February 19, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 11, 2007
Flight Time:	989 hours (Total, all aircraft), 684 hours (Total, this make and model), 20 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Gulfstream American Corp.	**Registration:**	N26975
Model/Series:	AA-5A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	AA50845
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 28, 2008 Annual	**Certified Max Gross Wt.:**	2206 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1533 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-E2G
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MQY,543 ft msl	**Distance from Accident Site:**	33 Nautical Miles
Observation Time:	12:56 Local	**Direction from Accident Site:**	25°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 16 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.89 inches Hg	**Temperature/Dew Point:**	24°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lewisburg, TN (LUG)	**Type of Flight Plan Filed:**	None
Destination:	Lewisburg, TN (LUG)	**Type of Clearance:**	None
Departure Time:	12:58 Local	**Type of Airspace:**	Unknown

Airport Information

Airport:	Ellington Airport LUG	**Runway Surface Type:**	Asphalt
Airport Elevation:	717 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	20	**IFR Approach:**	None
Runway Length/Width:	5002 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Minor	**Latitude, Longitude:**	35.493057,-86.804443

Administrative Information

Investigator In Charge (IIC):	Simpson, Eliott
Additional Participating Persons:	Rocky Davidson; FAA/FSDO; Nashville, TN
Original Publish Date:	October 21, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68031