Aviation Investigation Final Report

Location:	Baxley, Georgia	**Accident Number:**	ERA21LA030
Date & Time:	October 25, 2020, 13:37 Local	**Registration:**	N920JL
Aircraft:	Grumman AA5	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Minor, 2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that before takeoff for the personal flight, he performed an engine run-up, which included a check of the magnetos, carburetor heat, fuel pressure, oil pressure, and oil temperature. After takeoff, at an altitude of about 500 ft mean sea level (msl), he checked the instruments, which "looked good," and the airplane was climbing about 500 ft per minute. About 600 ft msl, the airplane "didn't feel right," and he noticed a "significant loss of power." He then lowered the nose to gain speed; however, the airplane did not gain speed and started to descend. He selected a location for an off-airport landing. The airplane landed in a wooded area of 4- to 8-ft-tall pine trees and sustained substantial damage to both wings.

The weather conditions at the time of the accident were conducive to the accumulation of carburetor ice at glide power settings. However, the pilot applied the carburetor heat during the engine run-up just before takeoff, which should have either melted any minor ice that may have accumulated on the ground or resulted in a rough running engine, which the pilot did not report. The application of carburetor heat during the run-up combined with the high power setting during takeoff and initial climb reduced the likelihood of carburetor ice.

The most significant finding of a postaccident examination of the engine included that there was a hole in the left exhaust riser, and an accumulation of soot in the carburetor heat muff and tubing, airbox, and carburetor throat. This was indicative of exhaust gases leaking into the carburetor heat and engine induction systems. However, the pilot did note any anomalies during the engine runup and test of carburetor heat function and did not report activating the carburetor heat during the accident takeoff or subsequent forced landing. Given this information, it could not be definitively determined what role the exhaust leak played in the loss of engine power during the accident flight.

Based on available evidence, the reason for the partial loss of engine power could not be determined.

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 undetermined reasons.

Findings

Aircraft	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Initial climb	Off-field or emergency landing

On October 25, 2020, at 1337 eastern daylight time, a Grumman AA5 airplane, N920JL, was substantially damaged when it was involved in an accident in Baxley, Georgia. The private pilot sustained minor injuries; the two passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, before departure from Baxley Municipal Airport (BHC), Baxley, Georgia, he performed a preflight inspection of the airplane using the checklist and found no anomalies. He then taxied to the fueling station and added 12 gallons, which filled both the left and the right fuel tanks to "the tabs" (resulting in a quantity of about 13 gallons in each 19-gallon-capacity tank). He then resampled the fuel from the tanks, reboarded the airplane, and taxied to runway 26. Before takeoff, he performed an engine run-up, and checked the magnetos, carburetor heat, fuel pressure, oil pressure, and oil temperature. After takeoff, at an altitude of about 500 ft mean sea level (msl), he checked the instruments, which "looked good," and the airplane was climbing about 500 ft per minute. About 600 ft msl, the airplane "didn't feel right," and he noticed a "significant loss of power." He then lowered the nose to gain speed; however, the airplane "was not gaining speed and it started to descend." He focused his attention outside the airplane and selected a location for an off-airport landing. He did not look at the instruments, but he recalled that the propeller continued to rotate. The airplane landed in a wooded area of 4- to 8-ft-tall pine trees.

Examination of the accident scene by a Federal Aviation Administration inspector revealed that the airplane sustained substantial damage to both wings. The left wing was fractured near its root and bent downward about mid span. The right wing sustained leading edge damage near its tip and was also bent downward about mid span. Fuel was present in both tanks and leaking from the left tank, which was breached. The fuel selector was in the left position. The throttle control was nearly full forward (about 1/2 inch 'out'); the mixture control was full rich; the carburetor heat control was off; and the primer control was in and locked. The engine was partially separated from the firewall.

Engine crankshaft and valvetrain continuity were confirmed by rotating the propeller by hand. All valve push rods and rocker arms were undamaged and operated as expected. The vacuum pump at the rear of the engine rotated as the propeller was turned. Oil was present around the base of cylinder No. 2. A cold compression test was performed on each cylinder, and some leakage was observed on one cylinder. The top spark plugs exhibited normal wear, and the electrodes on all were dark in color. Both magnetos produced spark on all leads when rotated with an electric drill. The air intake scoop and boot were free of obstructions. The induction air

filter contained a small amount of debris but was unobstructed. The fuel line from the electric boost pump outlet to the engine driven fuel pump inlet was removed. It contained fuel that was blue in color and contained some sediment. The electric boost pump fuel filter contained blue fuel and sediment. The fuel pump power wire was broken, consistent with impact damage. The pump operated when external electric power was applied. The engine-driven fuel pump outlet line was removed, and fuel was present in the line. The pump actuating rod inside the engine moved up and down when the propeller was rotated by hand; the pump was removed and discharged fuel from the outlet when operated manually.

The throttle and mixture controls remained securely attached to the carburetor. The carburetor was removed, and the throttle and mixture levers moved freely from stop to stop. The accelerator pump sprayed fuel when the throttle lever was moved to the full open position. The carburetor inlet screen was absent of debris. The carburetor bowl was removed and was about 1/8 full of fuel. The floats were intact and moved freely; the inlet needle valve opened and closed at the float assembly when moved up and down by hand.

The carburetor heat hose flange on the muff exhibited some burn through and cracking. After removal of the heat muff, a 1/8-inch hole was found in the exhaust riser, with cracks emanating from each side of the hole. Soot was present on the inside of the carburetor muff, the carburetor heat hose, the inside of the carburetor air box (on both sides of the air box butterfly valve), and in the carburetor throat and venturi.

A sample of fuel taken from the BHC fuel farm was blue in color and absent of debris and water.

A review of the maintenance logbooks revealed that the engine was last overhauled in August 1999, about 594 hours before the accident. The air filter element was replaced on May 12, 2020, about 196 hours before the accident. A 100-hour inspection was completed on August 2, 2020, at an aircraft total time of 1,956 hours (about 107 hours before the accident) during which the carburetor was replaced. An annual inspection of the airplane was completed on October 22, 2020, at an aircraft total time of 2,060 hours (about 3 hours before the accident) during which the spark plugs were cleaned, gapped, and rotated, and the exhaust and induction systems were checked.

A review of the pilot's logbook revealed that the last entry was a record for the pilot's most recent flight review, which was completed on July 3, 2020. The flight was 1.1 hours and was in the accident airplane. The review did not reveal any additional flight experience in the same make/model.

A review of weather records revealed that at the time of the accident, the temperature and dewpoint recorded at the Bacon County Airport (AMG), Alma, Georgia, located about 12 nautical miles southeast of the accident location, were 79°F and 66°F, respectively. According to a carburetor icing probability chart, these conditions were conducive to "serious icing at glide power settings."

Pilot Information

Certificate:	Private	**Age:**	48,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	June 1, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 250 hours (Total, all aircraft), 1.1 hours (Total, this make and model), 200 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman	**Registration:**	N920JL
Model/Series:	AA5	**Aircraft Category:**	Airplane
Year of Manufacture:	1972	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	AA5-0176
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 22, 2020 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	2.6 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2060 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-E2G
Registered Owner:	Baxley Aviation LLC	**Rated Power:**	150 Horsepower
Operator:	Baxley Aviation LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	AMG,206 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	13:36 Local	**Direction from Accident Site:**	208°
Lowest Cloud Condition:	Scattered / 2000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	26°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Baxley, GA	**Type of Flight Plan Filed:**	None
Destination:	Baxley, GA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Baxley Municipal Airport BHC	**Runway Surface Type:**	Asphalt
Airport Elevation:	201 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	5003 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 2 None	**Latitude, Longitude:**	31.713833,-82.393778(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Rodney Hood; FAA/FSDO; Atlanta, GA
Original Publish Date:	September 21, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=102187