Aviation Investigation Final Report

Location:	Marietta, Pennsylvania	**Accident Number:**	NYC02FA152
Date & Time:	August 1, 2002, 20:30 Local	**Registration:**	N81310
Aircraft:	Grumman American AA-5B	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A witness observed the pilot was having difficulty starting the engine. After the engine started, the airplane was taxied to the runway. The witness then observed the airplane in a steep 45-degree left bank, until it disappeared behind corn stalks. A second witness observed the accident airplane depart from the airport and the engine "cut off and on five times" before descending to the ground. A third witness observed the airplane in a sharp bank, with the left wing tipped downward and the right wing pointed towards the sky, before it disappeared below a tree line. On a recent flight, the pilot was observed having difficulty starting the engine. He also requested maintenance assistance for a rough running magneto. The maintenance performed on the airplane included removal, cleaning, and verifying specifications of both magnetos, and all spark plugs. Review of the airplane's maintenance logs did not reveal any entries related to magneto or spark plug malfunctions. After the accident, neither the left or right magnetos could be tested due to impact and fire damage. A review of FAA-H-8083-3, Airplane Flying Handbook, revealed, "...If an actual engine failure should occur immediately after takeoff and before a safe maneuvering altitude is attained, it is usually inadvisable to attempt to turn back to the field from where the takeoff was made. Instead, it is safer to immediately establish the proper glide attitude, and select a field directly ahead or slightly to either side of the takeoff path." There were several non-populated clear areas/fields along, and on either side of, the departure path.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision to operate an airplane with known mechanical deficiencies, his improper decision to return to the airport with inadequate altitude remaining, and his failure to maintain airspeed. A factor related to the accident was the malfunction of the ignition system,

which resulted in a loss of engine power.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (F) IGNITION SYSTEM - MALFUNCTION
2. (C) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - IMPROPER - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
3. TERRAIN CONDITION - CROP
4. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
5. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
6. STALL - INADVERTENT - PILOT IN COMMAND
7. ALTITUDE/CLEARANCE - INADEQUATE - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On August 1, 2002, about 2030 eastern daylight time, a Grumman American AA-5B, N81310, was destroyed when it impacted terrain, shortly after takeoff from the Donegal Springs Airpark (N71), Marietta, Pennsylvania. The certificated private pilot and three passengers were fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local personal flight conducted under 14 CFR Part 91.

A witness was located about 75 feet west of the accident airplane as it was parked on the ramp at N71. The airplane caught the witness's attention because the pilot was having difficulty starting the engine. After the engine started, the airplane was taxied to the runway. The witness then proceeded by car from the airport's parking lot, where he observed the airplane in a steep 45-degree left bank, until it disappeared behind corn stalks.

A second witness observed the accident airplane depart from the airport. The airplane was only airborne about 45 seconds, and the engine "cut off and on five times" before descending to the ground.

A third witness observed the airplane in a sharp bank, with the left wing tipped downward and the right wing pointed towards the sky, before it disappeared below a tree line. The witness did not recall hearing any sounds from the engine.

The accident occurred during the hours of daylight, at 40 degrees, 05.16 minutes north longitude, 76 degrees, 34.97 minutes west latitude, at an elevation of 446 feet.

PERSONNEL INFORMATION

The pilot held a private pilot certificate for single-engine land airplanes. His most recent application for a Federal Aviation Administration (FAA) third-class medical certificate was issued on July 24, 2001.

According to the pilot's logbook, he had accumulated about 275 hours of total flight experience.

METEOROLOGICAL INFORMATION

The weather reported at an airport 7 miles east of N71, at 2053, was wind from 360 degrees at 5 knots, clear skies, and 10 statute miles of visibility. The temperature was 82 degrees Fahrenheit, and the dew point 68 degrees Fahrenheit.

AIRCRAFT INFORMATION

The most recent annual inspection of the airplane was performed on July 17, 2002. At the time of the inspection, the airplane had a total flight time of 7,777.9 hours, and the engine had accumulated 1,142.2 hours of operation since major overhaul. During the inspection, the magneto timing was checked, and the spark plugs were cleaned and gapped.

According to personnel from N71, the pilot had recently purchased the airplane from an individual in Arcadia, Florida. The pilot flew the airplane from Arcadia to N71 during the week of July 19, 2002. According to the pilot's logbook, the total flight time for the trip from Florida was about 12.3 hours.

The airplane was then flown again on July 29, from N71, on a local flight for about 1/2 hour. No further entries were noted in the logbook.

According to a representative of a fixed base operator in Lake City, Florida, where the pilot stopped on July 24, for fuel, the pilot had difficulty starting the engine when he prepared to depart. The pilot did not request, nor receive any maintenance assistance.

According to a representative of a fixed base operator in Florence, South Carolina, where the pilot stopped later in the day on July 24, the pilot requested maintenance assistance for a "rough running magneto." The maintenance performed on the airplane included removal, cleaning and verifying specifications of both magnetos, and all spark plugs.

Review of the airplane's maintenance logs did not reveal any entries related to magneto or spark plug malfunctions.

WRECKAGE AND IMPACT INFORMATION

The wreckage site was located in a cornfield, about 1/2 statute mile, and a magnetic bearing of approximately 211 degrees from N71. The accident site was disturbed prior to the arrival of Safety Board personnel due to emergency rescue procedures. In addition, the area had been doused with water and firefighting agents to contain the post crash fire.

The main fuselage was located about 65 feet from the first noted damage to the corn stalks, oriented on about a 330-degree magnetic bearing. It was consumed by the post-crash fire and destroyed. All crew and passenger seats were destroyed and separated from their attachment points.

All major control surfaces of the airplane were accounted for at the accident scene.

The engine was separated from the main fuselage. The propeller remained attached to the engine. One propeller blade was bent rearward about 70-degrees at it's mid point, and was

melted outboard of the bending area. The other propeller blade remained intact, and was slightly twisted.

The left wing tip and left wing aileron were located about 22-feet beyond the initial impact point. The aileron control stop was examined, and did not reveal any discrepancies. The left wing, which was separated from the main fuselage, was located about 5 feet prior to the main fuselage. The wing was separated into two sections.

The right wing remained attached to the main fuselage and was consumed by the post-crash fire.

The post-crash fire consumed the empennage, with the exception of a 4-foot section of right horizontal stabilizer and elevator, and the entire left elevator. Flight control continuity was established from the cockpit area to the rudder and elevators. The rudder and stabilator control stops were examined, and did not reveal any discrepancies.

All separated flight control cables exhibited frayed ends, consistent with tension overload, and no evidence of corrosion was noted at the separation points.

The engine was recovered from the accident site and examined. The crankshaft was rotated via the propeller. Compression and valve train continuity was confirmed to all cylinders. The top and bottom spark plugs were removed and examined. Their electrodes were intact. The number 1 and 3 cylinder top and bottom sparkplugs were light gray in color, while the number 2 and 4 cylinder top and bottom sparkplugs were oil soaked. Both the left and right magnetos could not be tested due to impact and fire damage.

ADDITIONAL INFORMATION

According to records retained by personnel at N71, the airplane was last fueled on July 29, 2002, with 28.2 gallons of 100LL aviation gasoline.

A review of FAA-H-8083-3, Airplane Flying Handbook, revealed:

"...If an actual engine failure should occur immediately after takeoff and before a safe maneuvering altitude is attained, it is usually inadvisable to attempt to turn back to the field from where the takeoff was made. Instead, it is safer to immediately establish the proper glide attitude, and select a field directly ahead or slightly to either side of the takeoff path."

There were several non-populated clear areas/fields along, and on either side of, the departure path.

A review of a FAA carburetor icing probability chart placed the reported temperature and dew point in the "serious icing at glide power" area of the chart.

The airplane wreckage was released on August 2, 2002, to a representative of the owners insurance company.

Pilot Information

Certificate:	Private	**Age:**	40,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
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:**	July 24, 2001
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	275 hours (Total, all aircraft), 20 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman American	**Registration:**	N81310
Model/Series:	AA-5B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	AA5B0491
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 17, 2002 Annual	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	13 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7777 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360
Registered Owner:	Gerald L. Shenk	**Rated Power:**	180 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LNS,403 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	20:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	28°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Marietta, PA (N71)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	20:28 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Donegal Springs N71	**Runway Surface Type:**	Asphalt
Airport Elevation:	458 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	28	**IFR Approach:**	None
Runway Length/Width:	3250 ft / 50 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	40.087776,-76.581947

Administrative Information

Investigator In Charge (IIC):	Demko, Stephen
Additional Participating Persons:	Robert Stoll; FAA; Harrisburg, PA David Moore; Lycoming Engines; Williamsport, PA
Original Publish Date:	February 5, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55357