Aviation Investigation Final Report

Location:	BROOKVILLE, Ohio	**Accident Number:**	NYC98LA067
Date & Time:	February 21, 1998, 23:40 Local	**Registration:**	N5625L
Aircraft:	Grumman American AA-5	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Serious, 1 Minor, 2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Before takeoff, the pilot determined that the airplane had approximately 30 gallons of fuel, by visually looking into the fuel tanks and using fuel burn calculations from the airplane's last flight. The airplane departed, drawing fuel from the left tank. While en route, the pilot noticed that the left fuel gauge was indicating empty, and switched the fuel selector to the right tank. Concerned about low fuel, the pilot diverted to refuel. Prior to landing, the pilot switched the fuel selector back to the left tank. On final approach, the pilot elected to go-around with full flaps. The airplane climbed to about 30 feet, and continued for about 1/2 mile, then turned back to the airport. Upon completion of the turn, the engine lost total power. The airplane lost altitude, stalled, and impacted trees, rupturing both fuel tanks. There was approximately a 1 gallon fuel spill, on the pavement, under each of the ruptured fuel tanks. There was no evidence of fuel spillage in the area where the fuel tanks had been ruptured, and no fuel was observed in the fuel tanks.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's misjudgment of the fuel supply.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: MANEUVERING - TURN TO REVERSE DIRECTION

Findings
1. (C) FUEL SUPPLY - MISJUDGED - PILOT IN COMMAND
2. GO-AROUND - IMPROPER - PILOT IN COMMAND
3. STALL - INADVERTENT - PILOT IN COMMAND
4. CHECKLIST - NOT FOLLOWED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ROLL

Findings
5. OBJECT - TREE(S)

Factual Information

On February 21, 1998, about 2340 Eastern Standard Time, a Grumman American AA-5, N5625L, was destroyed when it collided with trees during a forced landing at the Brookville Air-Park (I62), Brookville, Ohio. The certificated private pilot and one passenger were not injured. A second passenger received minor injuries, and a third passenger was seriously injured. Visual meteorological conditions prevailed for the flight that departed the Sylvania Airport (C89), Sturtevant, Wisconsin, about 1955, destined for New Lebanon, Ohio. No flight plan was filed for the personal flight conducted under 14 CFR Part 91.

According to the pilot, the airplane was at the Clow International Airport, Plainfield, Illinois, and fueled to it's maximum capacity. The airplane was then flown to C89. Before takeoff from C89, the pilot determined that the airplane had approximately 30 gallons of fuel, by visually looking into the fuel tanks and using fuel burn calculations from the airplane's last flight. The pilot also checked the fuel gauges located in the cockpit, and recalled seeing the right tank as full and the left as "just below full."

The airplane departed C89, drawing fuel from the left tank, on a night cross country flight, that was to be conducted no higher than 3,500 feet mean sea level. While en route, over Marion, Indiana, the pilot noticed that the left fuel gauge was indicating on the red empty marker. The pilot estimated that he would still have 20-25 minutes remaining in the left tank, and switched the fuel selector to the right tank. As the flight progressed, the pilot estimated that there was a high rate of fuel burn, and with low fuel, elected to divert to I62 to refuel. Upon arriving at I62, the pilot switched the fuel selector to left tank, and configured the airplane for an approach to Runway 9. On final approach, the pilot decided that the airspeed was too fast to make a safe landing, and elected to go-around with full flaps. The airplane climbed to about 30 feet and would not climb any higher. The airplane continued for about 1/2 mile, when the pilot decided to make a 270 degree turn to back to the airport. Upon completion of the 270 degree turn, the airplane started to lose altitude and impacted trees.

The pilot also stated that at impact, he pulled the mixture control to idle cut-off, pulled the carburetor heat control to the on position, and shut the master switch off. The airplane then impacted the ground and came to rest on a access road, short of Runway 27.

The pilot made a voluntary statement to a Montgomery County Sheriff shortly after the accident. In the statement the pilot said, "...I came in on final from the west, but could not loose my airspeed so made a go-around. After pushing throttle in, the engine did not seem to pick up RPM's, carburetor heat was in, but plane did not want to gain altitude. I attempted to return to field and stall horn came on, so I put nose down, engine seemed to cut out and could not hold altitude and airspeed bled off resulting in crash."

A witness, who lived 250 feet from Runway 27 at I62, stated to a Federal Aviation Administration Inspector that, "...aircraft completed 180 degree turn, still making power. After 180 turn, nose pitched down noticeably and engine was not noticeable, like it wasn't making power, aircraft now facing you and descending. From the sink rate, angle to runway and aircraft attitude, and no noticeable engine sound, you knew it was going to crash at this point."

Examination of the wreckage by the FAA Inspector revealed no evidence of mechanical malfunctions or failures with the airplane. The airplane had touched down in a field, approximately 40 feet from where it came to rest. After the airplane touched down, it impacted two small trees, rupturing the fuel tanks. There were four distinct marks, four feet in length, located in the field where the airplane touched down. Three of the marks matched up with the landing gear. The propeller was found attached to the airplane. One propeller blade was bent straight back with mud residue on it and the other propeller blade had no damage. There was approximately a 1 gallon fuel spill, on the pavement, under each of the ruptured fuel tanks. There was no evidence of fuel spillage in the area where the fuel tanks had been ruptured. About 2 tablespoons of fuel was removed from the carburetor inlet fuel line, and no fuel was observed in the fuel tanks. The throttle control, located in the cockpit was observed pushed in, to the "full power" position. The fuel mixture control was observed pushed in, to the "full rich" position, and the carburetor heat control was pulled out, to the "on" position. The flaps were observed to be fully extended.

The airplane had been airborne for about 2 hours and 45 minutes.

The Cruise and Range Performance chart, in the Grumman American AA-5 Owners Manual, stated that, at an altitude of 3,500 feet and 71 percent power, there was a fuel burn rate of 8.1 gallons per hour. Additional notes included in the chart were "Range and endurance data include allowance for take-off and climb. No fuel reserve is included. Fuel consumption is for level flight with mixture leaned....Continuous operations at powers about 75 percent should be with full rich mixture."

The Grumman American AA-5 Owners Manual also provided the following information:

BEFORE TAKE-OFF

1. Console check: a. Microphone (if installed): Secure. b. Trim Wheel: At take-off setting. c. Flaps: Check for correct operation. d. Flaps: UP
e. Fuel: On fullest tank.

BALKED LANDINGS (Go-arounds) "Should a landing be balked, apply full power immediately; carburetor heat OFF; establish a positive rate of climb; retract the flaps and trim for normal climb."

BALKED LANDING 1. Apply full throttle. 2. Carburetor heat OFF. 3. Establish climb attitude. 4. Flaps: Retract, after accelerating to safe airspeed.

The pilot reported no mechanical malfunctions with the airplane.

The winds reported from a nearby airport were calm.

Pilot Information

Certificate:	Private	**Age:**	53,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:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	December 4, 1996
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	315 hours (Total, all aircraft), 104 hours (Total, this make and model), 315 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Grumman American	**Registration:**	N5625L
Model/Series:	AA-5 AA-5	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	AA-5-0225
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 1, 1997 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:	70 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3166 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	L-46047-27A
Registered Owner:	GLENN F PUGH	**Rated Power:**	150 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	DAY ,1010 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	22:51 Local	**Direction from Accident Site:**	265°
Lowest Cloud Condition:	Unknown	**Visibility**	9 miles
Lowest Ceiling:	Overcast / 4500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	4°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	STURTEVANT , WI (C89)	**Type of Flight Plan Filed:**	None
Destination:	NEW LEBANON , OH (I65)	**Type of Clearance:**	None
Departure Time:	20:10 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	BROOKVILLE AIR-PARK I62	**Runway Surface Type:**	Asphalt
Airport Elevation:	1037 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	2500 ft / 30 ft	**VFR Approach/Landing:**	Go around;Straight-in

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious, 1 Minor, 1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor, 2 None	**Latitude, Longitude:**	39.829441,-84.409088(est)

Administrative Information

Investigator In Charge (IIC):	Kukla, Randi-jean
Additional Participating Persons:	JIM FRANKLIN; CINCINNATI , OH
Original Publish Date:	March 8, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=39534

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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.