



National Transportation Safety Board Aviation Accident Final Report

Location:	Orangeville, IL	Accident Number:	CEN17LA180
Date & Time:	05/11/2017, 1945 CDT	Registration:	N1041N
Aircraft:	BROKAW BERGON F ZODIAC	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot returned to a private airstrip after a 35-minute flight and planned to perform a touch-and-go takeoff. However, after takeoff and while climbing, the engine started to run rough and then lost power. The pilot selected a field for the forced landing, during which the airplane impacted terrain hard and then came to rest upright.

An examination of the airplane revealed that the right fuel tank appeared empty, that fuel was visible in the left tank, and that only residual fuel remained in the header tank, which was breached during the accident. A fuel pump circuit breaker was found open, and the fuel selector was found in the "off" position. The examination of the engine revealed that the engine's three-bladed propeller did not exhibit rotational signatures, indicating that the engine was not running at impact. The spark plugs were removed and appeared normal. The engine was then rotated by hand, and thumb compression and continuity through the drive/valve train were established. Both carburetor float bowls were removed and were empty of fuel; no contaminants or obstructions were noted. The gascolator was removed, and only a small amount of fuel was found; the fuel pump was removed, and only minimal fuel was found.

An engine test run was then conducted at power, and the engine ran for several minutes; no anomalies were noted. The fuel source was removed to see how long the engine would run on the residual fuel in the system. Within several minutes, the engine began running rough and then lost power. A postrun examination of the carburetor float bowls, fuel pump, and gascolator revealed an absence of fuel in each, similar to their condition before the engine test run. The accident is consistent with fuel starvation, likely due to the fuel not transferring from a wing fuel tank to the header tank, either due to an open fuel pump circuit or because the right wing fuel tank was empty.

Probable Cause and Findings

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

The total loss of engine power due to fuel starvation.

Findings

Aircraft	Fuel - Fluid level (Cause) Fuel distribution - Not specified
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Factual Information

On May 11, 2017, about 1945 central daylight time, a Brokaw Bergon Zodiac airplane, N1041N conducted a forced landing near Orangeville, Illinois. The pilot received serious injuries and the airplane was substantially damaged during the accident. The airplane was registered to and operated by a private individual under the provisions of the *14 Code of Federal Regulations Part 91* as a personal flight. Visual meteorological conditions prevailed at the time.

The pilot reported that he had flown for 35 minutes and planned to do another takeoff and landing at his private airstrip. Just after the takeoff and while he was in the climb, the engine started to run rough and then lost power. The pilot selected a hay field for the forced landing; however, the airplane impacted terrain hard and came then to rest up-right.

The responding Federal Aviation Administration (FAA) inspector noted substantial damage to the airplane's fuselage and wings. The right wing fuel tank appeared empty, fuel was visible in the left wing fuel tank, and only residual fuel remained in the header tank, which appeared to have been breached during the impact. A fuel pump circuit breaker was also open, and the fuel selector was in the off position.

The airplane was recovered to the pilot's hangar, and an examination was conducted by an FAA inspector and a technical representative from the engine manufacturer on May 20, 2017. The engine's three bladed propeller (with one broken blade) was absent rotational signatures; the sparkplugs were removed and appeared normal. The engine was then rotated by hand and a thumb compression and continuity check through the drive/valve train was established. Both carburetor float bowls were removed and were empty of fuel; no contaminants or obstructions were noted. The gascolator was removed and only a small amount of fuel was found.

The fuel line to the gascolator was then placed in a container of automobile fuel. The engine was then started and run to power for several minutes; no abnormalities were noted. With the fuel source removed, the engine ran rough, then lost power. A post run examination of the carburetor float bowls, fuel pump, and gascolator found levels of fuel similar to that found prior to the engine run.

History of Flight

Initial climb	Fuel starvation Loss of engine power (total) (Defining event)
Landing	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	53
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Sport Pilot Without Waivers/Limitations	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	04/03/2007
Flight Time:	560 hours (Total, all aircraft), 97 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	BROKAW BERGON F	Registration:	N1041N
Model/Series:	ZODIAC HD	Aircraft Category:	Airplane
Year of Manufacture:	1997	Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	6-3013-HDS
Landing Gear Type:	Tricycle	Seats:	
Date/Type of Last Inspection:	03/21/2010, Condition	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	196.6 Hours at time of accident	Engine Manufacturer:	BOMBARDIER
ELT:	Installed, not activated	Engine Model/Series:	ROTAX 912
Registered Owner:	On file	Rated Power:	80 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KFEP	Distance from Accident Site:	
Observation Time:	1955 CDT	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	10 Miles
Lowest Ceiling:	Broken / 4800 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	120°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	17° C / 12° C
Precipitation and Obscuration:	No Precipitation		
Departure Point:	Orangeville, IL	Type of Flight Plan Filed:	None
Destination:	Orangeville, IL	Type of Clearance:	None
Departure Time:	CDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	42.472500, -89.648333 (est)

Administrative Information

Investigator In Charge (IIC):	Craig Hatch	Report Date:	01/25/2018
Additional Participating Persons:	Spencer Cull; FAA FSDO; Dupage, IL Jordan Paskevich; Rotax Aircraft engines - Rotech Flight Safety; BC		
Publish Date:	01/25/2018		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=95163		

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