Aviation Investigation Final Report

Location:	Laurel, Maryland	**Accident Number:**	ERA13FA325
Date & Time:	July 18, 2013, 10:11 Local	**Registration:**	N2333Z
Aircraft:	Beech 23	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot stated that he had sold the airplane the previous year and that the new owner had left the airplane at the pilot's home airport, where mechanics were working on it. The new owner told the pilot that someone had taken one of the cowl plugs. The new owner then removed the remaining one. The airplane sat unattended for 7 months without any cowl plugs before the new owner moved and wanted the airplane relocated to an airport near his home. The pilot volunteered to fly it there.

Two days before the flight, the pilot began to prepare the airplane. He stated that he conducted a thorough check of the cowling, engine, and engine mount area due to the amount of time that it sat without cowl plugs. He removed two bird nests, straw, and other debris. He checked the engine mount area through an access panel. After cleaning, there appeared to be no debris in the engine compartment. On the day before the flight, he fueled the airplane with 50 gallons of fresh fuel and ran the engine for 30 minutes. He taxied around to verify flight control continuity and checked the brakes. He stated that everything was normal. On the day of the accident, the pilot preflighted the airplane and visually confirmed that the wing tanks were full of fuel. He selected the left tank before taxi, and prior to departure conducted an engine run-up, checking the engine for about 15 minutes. He checked the magnetos and carburetor heat during the run-up, and both were normal. He then extended the wing flaps to 15 degrees and proceeded to take off. He reported that everything was normal until the airplane was over the end of the runway, about 250 feet above the ground, when the engine suddenly lost power. The pilot switched tanks and turned on the boost pump in an unsuccessful attempt to get the engine to run. He maneuvered to find a place to land, but was over a residential area and crashed into a tree and houses before coming to rest.

Examination of the wreckage revealed preexisting damage to the left wing and fuselage, as well as other anomalies that would have rendered the airplane unairworthy before the accident. The engine compartment contained the remains of bird nests and bird excrement, which would have affected the air-cooled engine's ability to maintain a normal operating temperature. The cloth jacketing from a foam-filled cowl plug along with the foam insert were protruding from and blocking the engine combustion air

inlet opening. This would have cut off the engine's ability to intake air. Examination of the carburetor also revealed the presence of a golf ball-size mud dauber wasp nest in the carburetor throat below the main fuel nozzle, which would have also restricted air flow and atomization of fuel in the carburetor. Therefore, the condition of the airplane casts doubt on the thoroughness of the pilot's preparations and preflight inspection.

Review of Federal Aviation Administration (FAA) and maintenance records revealed that the pilot's most recent application for a medical certificate was in 2006, and that the airplane's last annual inspection was in 1998. The investigation also discovered that the airplane had been operated for about 278 hours in the 15 years since that inspection was performed. Further, the pilot had not applied for a special flight permit from the FAA for the flight, even though the airplane was overdue for its annual inspection. The pilot's decision to fly the airplane without a valid medical certificate, current annual inspection, or ferry permit indicates that he made a conscious decision to disregard basic safety practices.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight preparation of the airplane, which resulted in a total loss of engine power during takeoff and his decision to operate the unairworthy airplane.

Findings

Personnel issues	Preflight inspection - Pilot
Personnel issues	Scheduled/routine maintenance - Pilot
Aircraft	Recip eng front section - Inadequate inspection
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Qualification/certification - Pilot

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On July 18, 2013, about 1011 eastern daylight time, a Beech 23, N2333Z, was substantially damaged after a loss of power when it struck a tree and then houses shortly after takeoff from Suburban Airport (W18), Laurel, Maryland. The private pilot was seriously injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight operated under the provisions of Title 14 Code of Federal Regulations Part 91, destined for Gettysburg Regional Airport (W05), Gettysburg, Pennsylvania.

According to the pilot, on the morning of the accident, he awoke about 0830, and left for the airport. He arrived at W18 at approximately 0910. He then preflighted the airplane and visually checked the fuel. It was full of fuel as he had topped it off two days before, and "everything was normal". He selected the left tank before taxi, and prior to departure did an engine runup, checking the engine for about 15 minutes. He did a "mag and mag drop" check and a "carb heat drop" check during the run-up and "both were normal".

Prior to departure he selected "one notch of flaps", and proceeded to takeoff from runway 03. Everything was normal until the airplane was over the end of the runway at approximately 250 feet when the engine suddenly lost power. The pilot switched tanks, and turned on the boost pump in an attempt to get the engine to run without result. He then maneuvered to the left, and then to the right. The last thing he remembered was seeing a gray house.

Review of air traffic control data revealed that the pilot had filed a VFR special flight rules area (SFRA) flight plan. Prior to departure, the pilot had obtained a beacon code to operate within the Washington SFRA however; he was not able to contact air traffic control prior to the loss of engine power. Radar data indicated that after takeoff, the airplane reached a peak altitude of 300 feet, but approximately 9 seconds later at 10:10:20, descended below the floor of radar coverage.

According to a witness, at approximately this time, she observed the airplane flying west to east and noticed the left wing "dropped" and the plane started heading towards the ground. She then heard a "boom" and observed smoke.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot held a private pilot certificate with ratings for airplane single-engine land, and instrument airplane. He also held a repairman experimental aircraft builder certificate. His most recent application for a FAA third-class medical certificate was dated July 19, 2006. The pilot reported that he had accrued 3,571 total hours of flight experience.

AIRCRAFT INFORMATION

The accident aircraft was a four place, low wing monoplane of conventional construction. The all metal semi-monocoque airframe structure was composed of aluminum, magnesium, and alloy steel. The wings were constructed of bonded aluminum honeycomb. It was equipped with tricycle landing gear, and was powered by a 160 horsepower, four cylinder, normally aspirated, air cooled engine, driving a two bladed, fixed-pitch, forged aluminum propeller.

According to the pilot, the airplane had been previously damaged prior to the accident, when it had been involved in an off airport landing in Wyoming in 1984 where the right main landing gear, wing box assembly, and right wing lower wing skins were damaged. Then in 1985 the rudder was replaced after it was damaged, and then most recently, the right wingtip had been hit by a lawnmower.

According to FAA and maintenance records the airplane was manufactured in 1962. The engine had been overhauled on January 1, 1992 at 4,476.44 total hours of operation. The airplane's most recent annual inspection was completed on January 5, 1998 at 4719.0 total hours of operation, and at the time of the accident, the airplane had accrued 4997.56 total hours of operation.

METEOROLOGICAL INFORMATION

The recorded weather at Tipton Airport (FME), Fort Meade, Maryland, located 3 nautical miles east of the accident site, at 1012, included: winds 360 at 3 knots, 10 miles visibility, sky clear, temperature 31 degrees C, dew point 22 degrees C, and an altimeter setting of 30.12 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

Accident Site Examination

Post accident examination of the accident site revealed that the airplane had come to rest approximately a ½ mile from the departure end of runway 03. It initially made contact with a 40 foot tall pine tree, striking the tree approximately 24 feet above the base of the tree and fracturing the upper portion of the tree into two sections. The airplane then struck the northwest corner of a house separating the right wing from its mounting location. The airplane then continued forward approximately 70 feet, struck the west side of another house located across the street from the initial impact point with the tree, fracturing the fuselage just aft of the baggage door. It then came to rest against the southwest side of the residence with the left wing penetrating the front of the house.

Airplane Examination

Examination of the wreckage did not reveal any preimpact malfunctions of the airplane. There was no indication of structural failure and control continuity was established from the flight controls to the rudder pedals and control wheel. Further examination revealed that the right wingtip and right wing

outboard leading edge displayed damage that had been taped over with duct tape and appeared to have occurred prior to the accident. The rudder was also a different color than the rest of the airplane.

Both wing tank fuel caps were closed and locked. Both the left and right wing fuel tanks were compromised however; approximately 12 ounces of fuel was recovered from left wing fuel tank. Examination of the fuel revealed that it was consistent with 100LL aviation gasoline, and a check with water finding paste revealed no indication of water being present.

Examination of the fuel strainer also revealed the presence of fuel consistent with 100LL aviation gasoline and a check with water finding paste also did not reveal the presence of water.

Examination of the cockpit revealed that the wing flap lever was in the 15 degree (first notch) position and the stabilator pitch trim was in the takeoff range (green arc). The fuel selector was in the right wing tank position. The primer was in and locked. The throttle was full open, the mixture was full rich, and the carburetor heat was off. The fuel boost pump was also off.

Propeller and Engine Examination

Examination of the propeller revealed that the propeller had remained attached to the crankshaft flange. One blade was curved aft about 10 degrees and exhibited chord-wise abrasions on the forward surface. The other blade was bent aft about 45 degrees at about mid-span. It exhibited chord-wise abrasions and paint transfer on the forward surface of the blade.

Examination of the engine revealed that it had remained attached to the aircraft firewall by the tubular engine mount. Examination of the engine revealed that the engine compartment contained the remains of bird nests, and bird excrement. A red colored piece of cloth was also visible inside the right cowling inlet. Further examination of the cloth revealed that it was the cloth jacketing from a foam filled cowl plug and that the cloth jacketing along with the foam insert were protruding from, and blocking, the engine combustion air inlet opening.

The drive train was rotated by turning the crankshaft flange and continuity of the crankshaft to the rear gears and to the valve train was confirmed. Suction and combustion were observed from all four engine cylinders.

The carburetor remained attached to the engine and no external damage was noted. The carburetor bowl screws were snug and no fuel stains were noted on the exterior surfaces of the carburetor. The carburetor was partially disassembled. Liquid with an odor consistent with that of aviation gasoline was observed in the carburetor bowl. A check with water finding paste revealed no indication of water in the bowl. No damage was noted to the carburetor internal components however, it was discovered that, a mud dauber wasp nest about the size of a golf ball was present in the carburetor throat (venturi) below the main fuel nozzle.

The engine driven fuel pump remained attached to the engine. It was removed and produced air at the outlet port when actuated by hand.

Both magnetos remained attached to the engine and produced spark from all ignition towers, and no damage was observed on the ignition harness. The electrodes on the No.1, 2, 3, and 4 sparkplugs from the top of the cylinders were undamaged and appeared normal. The No. 1 cylinder bottom spark plug

was obstructed by the exhaust and was not removed. The No. 2, 3, and 4 cylinder bottom sparkplug electrodes, also were undamaged and appeared normal.

The starter had remained attached to the engine and displayed evidence of rotational scoring on the starter nose case. The generator had also remained attached to the engine and was undamaged.

The exhaust muffler displayed heavy rust deposits and circumferential cracking.

The engine contained about 6½ quarts of oil. The oil suction screen appeared clean, the inside of the oil filter appeared clean, the oil hoses to the oil cooler were secure, and oil cooler integrity was not compromised. According to the information recorded on the oil filter, the filter was last replaced on October 17, 2010 at 4995.26 total hours of operation.

TESTS AND RESEARCH

Additional Documents

Documents discovered in the wreckage revealed that some components on the airplane had either been worked on in the airplane or had been removed and replaced but had not been entered in to the aircraft logbook or engine logbook. These included the magnetos, attitude indicator, directional gyro, fuel filler caps, wingtips, and transponder.

Airplane Sale

According to the pilot the purpose of the flight was to deliver the airplane to its new owner who had purchased the airplane from him in September of 2012.

Review of FAA records revealed that the airplane was in a sale pending status but the sale had not been completed, and no aircraft bill of sale (FAA Form 8050-2) was on file.

Review of FAA records also did not reveal evidence of an FAA Special Flight Permit (FAA Form 8130-6) being submitted for the flight though the airplane did not have a current annual inspection.

Potential Buyer's Statements

According to the potential buyer, he had paid the pilot for the airplane approximately 1 year prior to the accident, and had a mechanic examine the airplane. The sale of the airplane was contingent on the mechanic's findings. In November of 2012, the mechanic reported back to him that the airplane had mechanical issues and that the airplane was not airworthy. The potential buyer than tried to get his money back from the pilot, but the pilot refused to return his money. The potential buyer threatened to sue the pilot. Then, a couple of days before the accident the pilot advised the potential buyer that the airplane was ready to go and the potential buyer assumed that "it was all legal," and the mechanical issues had been corrected. He was waiting for the airplane to be delivered when the accident occurred.

Mechanic's Statement

According to the mechanic who had inspected the airplane on behalf of the potential buyer, he inspected the airplane about 2 months prior to the accident. The airplane was in "deplorable condition" and did not

look like it had flown in years. When he inspected it, there were numerous problems which included; the airplane having been out of license for years, the right wing fuel tank not being able to hold fuel, the left wing tank fuel sump not draining, sand in all of the airplanes fuel sumps, bird nests in the engine compartment, the rudder being replaced, the seats needing recovering, electrical wiring falling out from underneath the instrument panel, the aft fuselage displaying some kind of pinching (deformation) aft of the wings, and the right wingtip being dented in, along the leading edge of the wing.

Additional Pilot Statement

On August 10, 2013, in a written statement to the NTSB, the pilot advised that he had sold the airplane in September of 2012. The new owner left the airplane at Suburban Airport and had mechanics working on it at the airport. In October of 2012, the new owner told him that someone had taken one of the cowl plugs. The new owner then removed the remaining one. The airplane sat unattended for 7 months without any cowl plugs. The new owner moved to Gettysburg, Pennsylvania and wanted the airplane relocated there. The pilot volunteered to fly it there.

Two days prior to the flight, the pilot began to prepare the airplane. He did a thorough check of the cowling, the engine, and the engine mount area due to the amount of time that it sat without cowl plugs. He removed two bird nests, straw and other debris. He was able to check the engine mount area through an access panel. After cleaning, there appeared to be no debris in the engine compartment. On the day before the flight, he fueled the airplane with 50 gallons of fresh "AVGAS" and ran the engine for 30 minutes. He taxied around for continuity and checked the brakes. "Everything was normal."

On the day of the flight, he performed his normal preflight inspection including a visual inspection inside the cowling. Everything was normal. He checked the fuel level and oil level. He checked the fuel sumps. He did a control integrity check. He selected the left wing tank before starting the engine, then started the engine and let it run about 15 minutes while he did the preflight checks and prepared the navigational settings.

The pilot then taxied from the parking space to the run-up ramp for runway 3. He conducted the pre-takeoff checks. The magneto checks were normal. The carburetor heat was normal. He adjusted the elevator trim to the takeoff position, set one "notch" of flaps, and then took off on runway 3. The engine rpm was normal, the rotation speed was normal, and the takeoff distance was normal.

The airplane climbed normally for about 250 feet but when he was over the far threshold of the runway, the engine stopped. It went silent but continued to rotate. At this time his airspeed was about 85 mph. He realized that he could not land in the remaining overrun and could not return to the airport. He then made a slight left turn to position the airplane over the lowest of the trees near a water treatment plant. While doing this, he switched the fuel selector to the right wing fuel tank and confirmed that the fuel pump was on.

Pilot Information

Certificate:	Private	**Age:**	70
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
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:**	July 19, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	3850 hours (Total, all aircraft), 2700 hours (Total, this make and model), 3800 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N2333Z
Model/Series:	23	**Aircraft Category:**	Airplane
Year of Manufacture:	1962	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	M-49
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 5, 1998 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	279 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4997.56 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-320-D2B
Registered Owner:	On file	**Rated Power:**	160 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:	FME,150 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	10:12 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	31°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Laurel, MD (W18)	**Type of Flight Plan Filed:**	VFR
Destination:	Gettysburg, PA (W05)	**Type of Clearance:**	VFR
Departure Time:	10:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Suburban Airport W18	**Runway Surface Type:**	Asphalt
Airport Elevation:	148 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	03	**IFR Approach:**	None
Runway Length/Width:	2324 ft / 40 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	39.089168,-76.824165

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	Anthony N Serio; FAA/FSDO; Baltimore, MD James M Childers; Lycoming Aircraft Engines; Williamsport, PA
Original Publish Date:	April 27, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87512