Aviation Investigation Final Report

Location:	Anahuac, Texas	**Accident Number:**	CEN09LA144
Date & Time:	January 29, 2009, 15:00 Local	**Registration:**	N3WC
Aircraft:	COX WILLIAM M BEARHAWK	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and two passengers departed in a single-engine homebuilt airplane for a local sightseeing flight. Several witnesses reported that the airplane was "low" and "wiggling up-and-down or weaving side-to-side". They added that the engine sounded like it was "missing" or making "popping" noise before the airplane then disappeared behind a row of trees. The examination of the engine revealed that the carburetor's venturi throat and throttle plate were sooted and displayed signatures consistent with back-firing up through the induction system. The discharge nozzle was also sooted. Additionally, use of a carburetor icing chart showed the airplane was operating in the general area of "serious to moderate icing at cruise power or serious icing at descent power" at the time of the accident. A review of a video from a camcorder found in the wreckage revealed that the right seat passenger filmed part of the flight leading up to the mishap. A sound spectrum study of the tape revealed that the engine was operating at a constant 2283 rpm until the last 20 seconds of the recording. During the last section of recording the engine speed appeared to fluctuate between 2220 and 2500 rpm; however, it was not determined whether this fluctuation was actually the engine behavior or an induced effected caused by rapid movement of the camera during the recording. It was also noted that the video revealed what appeared to be a routine flight until the last moments of the tape, when the camcorder captured a quick change in the aircraft's bank, pitch (or both). The tape ended prior to the actual accident/impact sequence. Examination of the airframe and engine failed to identify any pre-impact malfunctions.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of control in flight for undetermined reasons.

Findings

Not determined	(general) - Unknown/Not determined
Environmental issues	Conducive to carburetor icing - Not specified

Factual Information

History of Flight

Maneuvering	Loss of control in flight (Defining event)
Maneuvering	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On January 29, 2009, approximately 1500 central standard time, a single-engine, amateur-built airplane, Bearhawk, N3WC, was substantially damaged upon impact with terrain, following a loss of control, about 6 miles south of the Chambers County Airport (T00), Anahuac, Texas. The private pilot and two passengers were fatally injured. The airplane was owned and operated by a private individual. No flight plan was filed and visual meteorological prevailed for the Title 14 Code of Federal Regulations Part 91 personal flight.

There were no witnesses to the impact; however, six people in the area reported seeing the airplane just prior to the accident. The first witness reported that the airplane was low and the engine was "sputtering." The witness added the airplane was "wiggling up-and-down; three or four times, before going straight down behind a row of trees." Two other witnesses reported seeing the airplane about 150 feet above the ground with one of the witnesses reporting that it sounded like the engine was "missing." Another witness stated that the engine was making "popping" sounds. The final witness described the airplane as "low and weaving side-to-side, and up-and-down …. [then] abruptly took a nose dive."

The Federal Aviation Administration (FAA) Inspector, who arrived on scene, reported that the airplane impacted an open field. Airplane damage and ground impact signatures were consistent with the airplane being inverted during the collision with the ground. The fuselage, wings, engine, landing gear, and empennage were located at the crash site. The fuel tanks had been breached, and there was a strong fuel smell in the immediate area. Two aviation handheld GPS units and a Sony Hi8 camcorder were located in the wreckage and turned over to the NTSB Investigator-In-Charge (IIC).

PERSONNEL INFORMATION

The pilot/owner held a private pilot certificate with a rating for airplane, single-engine land and a mechanic; airframe and powerplant certificate. His most recent FAA third-class medical certificate was issued July 15, 2008. The pilot had accumulated approximately 1,795 total flight hours of flight experience.

METEOROLOGICAL INFORMATION

At 1350, an automated weather reported station at EFD, approximately 25 nautical miles west of the accident site, reported winds from 360 degrees at 8 knots, visibility 10 miles, few clouds at 25,000 feet, temperature 57 degrees Fahrenheit, dew point 34 degrees Fahrenheit, and a barometric pressure of 30.18 inches of Mercury.

At 1452, an automated weather reported station at GLS, approximately 26 nautical miles south of the accident site, reported winds from 350 degrees at 8 knots, visibility 10 miles, a clear sky, temperature 52 degrees Fahrenheit, dew point 38 degrees Fahrenheit, and a barometric pressure of 30.18 inches of Mercury.

Use of a carburetor icing chart showed the airplane was operating in the general area of "serious to moderate icing at cruise power or serious icing at descent power" at the time of the accident.

WRECKAGE AND IMPACT INFORMATION

The aircraft wreckage was retrieved and transported to a secure site. An examination was conducted by the NTSB IIC with a technical representative from Lycoming aircraft engines, at the salvage facility on 12 February 2009.

The cabin area was largely compromised by the impact; the wings had been removed for transport. Both wings appeared slightly crushed from the leading edge to about mid-span. The top wing skins exhibited a "wave effect".

The flight control cables to the ailerons, rudder, and elevator were found attached to their respected attach points. Several "salvage cuts" on the various control cables were noted. Continuity to the flaps was established.

The instrument panel was largely destroyed by the crash, and contained the "push-pull" controls for the throttle, propeller, and carburetor heat controls. The prop control was found to be out about ½ inch, the throttle control was full in, and the carburetor heat control was broken off. Due to the damage, no determination could be made on the position of the controls prior to impact.

No pre-impact anomalies were discovered with the airframe.

The airplane was powered by a Lycoming O-540 reciprocating engine, which was equipped with a Hartzell, two-bladed constant speed propeller. As a result of the ground impact, a top section of the engine cowling was formed over the engine. Several of the top sparkplugs were broken in addition to damage to the cylinders pushrod tubes. The propeller remained attached to the crankshaft flange. The crankshaft flange appeared slightly bent.

Both magnetos were removed from the engine. The left magneto contained an impulse coupling. When rotated by hand, both magnetos furnished spark to each ignition lead tower.

The engine was rotated by hand, a thumb compression was established on each cylinder and continuity to the back engine accessory case was confirmed. The engine cylinders were examined using a borescope. The carburetor and the airbox assembly, which was broken away from engine sump, was examined. The fuel inlet screen was removed, and appeared clean. The carburetor's airbox received minor damage, and the heat gate was free to move between the carb heat "on" and "off" positions freely. The position of the heat gate could not be determined prior to impact. The carburetor was disassembled and examined. It was noted that the venturi throat and throttle plate were sooted and displayed signatures consistent with back-firing up through the induction system to the carburetor. The discharge nozzle was also sooted. The signatures appeared consistent with carburetor icing.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot's autopsy was performed, by the Southeast Texas Forensic Center, Inc., DBA: Jefferson County Morgue on January 29, 2009. The Medical Examiner listed the cause of death for the pilot as, "multiple traumatic injuries …."

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report was positive for Azacyclonol.

TEST AND RESEARCH

One of the GPS units, downloaded by the National Transportation Safety Board's Vehicle Recorder Division Laboratory in Washington, D.C., provided pertinent data which began at 1435:25 CST, and at a latitude/longitude position fix corresponding to the RWJ Airpark (54T) in Baytown, TX. The GPS data shows the airplane's flight departing 54T, heading easterly following the shoreline of Trinity Bay. The final GPS position location fix was recorded at 1443:35 CST and placed the aircraft at N29° 42.698’ and W94° 41.348’ with 828 ft GPS altitude. The last calculated velocity and direction of travel was 130 mph groundspeed with a course of 169° true. The accident site was located approximately three-quarters of a mile from the last GPS position.

The camcorder was largely destroyed by the accident; however, the tape (8mm video cassette) received only minor damage and was also sent to the Board's vehicle recorder for review. The tape ended prior to the accident/impact sequence; however, the tape was examined for events leading up to the mishap. The video revealed what appeared to be a routine flight until the last moments of the tape, when the camcorder recorded a quick change in the aircraft's bank, pitch (or both). A sound spectrum study was performed and indicated that the engine was operating at a constant 2283 rpm until the last 20 seconds of the recording. During the last section of recording, the engine speed appeared to fluctuate between 2220 and 2500 rpm; however, it was not determined whether this fluctuation was actually the engine behavior or an induced effected caused by rapid movement of the camera around the cabin, during the

recording. The video also disclosed that the person wearing a blue flannel shirt and khaki colored pants was in the left-front seat and the individual wearing light brown colored work pants was in the right-front seat. Additionally, the video reveals that the person seated in the right-front seat was operating the camcorder.

Pilot Information

Certificate:	Private	**Age:**	67,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	July 15, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 1795 hours (Total, all aircraft), 100 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	COX WILLIAM M	**Registration:**	N3WC
Model/Series:	BEARHAWK	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	303
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	May 1, 2008 Condition	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	102 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed	**Engine Model/Series:**	O-540 SERIES
Registered Owner:	On file	**Rated Power:**	250 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:	EFD	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	13:50 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Few / 25000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.18 inches Hg	**Temperature/Dew Point:**	14°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Baytown, TX (54T)	**Type of Flight Plan Filed:**	None
Destination:	Baytown, TX (54T)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	29.76044,-94.669685(est)

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig
Additional Participating Persons:	Doug Idema; FAA FSDO; Houston, TX John Butler; Lycoming Engines; Arlington, TX
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=73287