Aviation Investigation Final Report

Location:	Flushing, Michigan	**Accident Number:**	CHI08LA191
Date & Time:	July 15, 2008, 10:08 Local	**Registration:**	N621CD
Aircraft:	Drochak Aventura II	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The amateur-built, experimental amphibian airplane had just departed the grass airstrip. About 100 feet above ground level just beyond the departure end of the airstrip, the engine lost power. Seconds later, the airplane impacted a tree and the ground in a left wing down, nose low attitude. Inspection of the propeller revealed no evidence of rotation at the time of impact. The fuel tank contained about 8 gallons of fuel. Flight control continuity was established. The engine rotated and an engine run was conducted and it operated. The inspection of the airframe and fuselage revealed no preexisting anomalies. The reason for the loss of engine power was not determined.

Probable Cause and Findings

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

Findings

Not determined	(general) - Unknown/Not determined
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 15, 2008, at 1008 eastern daylight time, an amateur-built, experimental Drochak Aventura II amphibian airplane, N621CD, was destroyed when it impacted trees and terrain after a loss of engine power during takeoff climb from Dalton Airport (3DA), Flushing, Michigan. The pilot received fatal injuries. The 14 Code of Federal Regulations Part 91 personal flight was departing from runway 27 on a local flight. Visual meteorological conditions prevailed at the time of the accident. No flight plan was filed.

A witness reported that he saw the airplane heading westbound from the airport at about 100 feet above ground level (agl), and then it entered a left turn to the south. The airplane made another left bank, and then it made a sudden nose dive into the ground. Other witnesses interviewed made similar statements.

One of the hangars located at 3DA was equipped with a security system that consisted of four video cameras and an area microphone. The cameras were aimed at the side of the ramp and taxiway adjacent to the grass runway. The cameras captured four different views of the accident flight. The security system captured the following information:

1. At 10:07:46, takeoff power was applied. The airplane was not in sight.

2. At 10:08:00 to 10:08:07, camera 4 showed the airplane after liftoff as it flew over the runway and then went out of view. The engine noise could be heard.

3. At 10:08:06, cameras 1 and 3 showed a shadow of the airplane as it flew over the runway. The engine noise could be heard.

4. At 10:08:08 to 10:08:18, camera 2 showed the shadow of the airplane as it appeared over the runway, and then was seen departing the end of the runway. The shadow of the airplane was seen turning left over the trees. The engine noise could be heard.

5. At 10:08:19, the engine sound quit.

6. At 10:08:23, the airplane was heard crashing into tress.

The 60-year-old pilot held a private pilot’s certificate. He was operating as a sport pilot, and was not required to possess a current Federal Aviation Administration (FAA) medical

certificate. He had a total of about 209 flight hours with about 41 hours in the make and model of the accident airplane.

The airplane was a two seat amateur-built, experimental Drochak Aventura II amphibian airplane with a 100-horsepower Rotax 912 ULS engine. The last conditional maintenance inspection was in July 2007, and it had flown 47 hours since the inspection. The stall speed in the clean configuration was about 42 mph and about 30 mph in the landing configuration. The airplane had two throttle control handles. The throttle handle for the left seat pilot was located on the left side of the cockpit. The throttle handle for the right seat pilot was located on the right side of the cockpit. The distance from the center of the cockpit to the throttle located on the right side of the cockpit was about 20.5 inches. The throttles on the carburetors were spring loaded to the full open position if the throttle linkage was disconnected.

The airplane collided with a tree and impacted the front lawn of a house just west of the road that bordered the west side of the airport. The wreckage of the entire airplane was confined to the initial impact site. The nose of the amphibian's fuselage was crushed aft and was broken at the cockpit's instrument panel. The engine was mounted aft of the airplane's high wing. The engine, engine mounts, and wing spars and struts exhibited forward buckling, and had compromised the cockpit space. The leading edge of the left wing was crushed aft and the left wing spar was broken. The right wing remained intact with no leading edge damage. The empennage exhibited no impact damage. The flight control cables exhibited continuity from the flight controls to the flight control surfaces.

The three bladed composite propeller remained attached to the engine. One blade was straight and appeared undamaged. The second blade was straight but had received impact damage about mid-span. The third blade was broken 12-15 inches from the propeller hub. None of the propeller blades exhibited leading edge gouges or chordwise scratching.

The engine was separated from the fuselage during recovery of the wreckage to a hangar facility. The engine was rotated by hand and no internal damage was noted. An engine run was conducted and it operated.

There was an 18-gallon fuel tank located behind the pilots' seats. The fuel tank was not ruptured and about 8 gallons of fuel remained. Both switches for the dual electronic ignition were found in the OFF position. It was not determined if a first responder had turned the switches to OFF. None of the first responders remembered setting the switches to OFF.

The pilot's throttle handle, handle strap, throttle control tube, and a portion of the left wing spar were sent to the National Transportation Safety Board's Materials Laboratory for examination. The inspection of the wing spar revealed that the fracture occurred in an area of the wing spar containing a hole with a smooth bore. The region around the fracture had evidence of plastic deformation, and the fracture surfaces had a 45-degree angle shear lip. The plastic deformation and 45-degree shear lip are consistent with a ductile fracture due to tension and bending overstress. There was no indication of preexisting damage that initiated the fracture.

The throttle control assembly was manufactured by pressing steel inserts into each end of an aluminum tube. The end of the throttle control tube that had been connected to the throttle hand strap was found with the insert separated from the tube. The steel inserts had a crosswise hole drilled through them so that once pressed into the tube, they could be secured in place by pressing a dimple into the tube, from the exterior, in alignment with the crosswise hole in the insert.

A tension test, to evaluate the pull out strength of the insert, was conducted on the intact end of the throttle control tube. The maximum force recorded during the tensile test was 1,191 pounds, after which the force gradually decreased until the entire insert had been extracted from the tube.

After the tensile test, it was observed that the insert from the intact end of the control tube was slightly different that the one that was found separated from the tube. Both inserts had the same diameter but the one from the intact side was slightly shorter. The insert that was pulled out during the test had a square shoulder around the crosswise hole while the insert that was found separated from the tube had a chamfer around the circumference of the crosswise hole. The location of the crosswise hole with respect to the outboard end of the insert was slightly different (0.02 inch).

The inspection of the throttle hand strap revealed that it exhibited plastic deformation, which was consistent with multiple applied forces from various directions as exhibited by the compound angle bends.

First responders reported that the pilot initially survived the accident, but was not responsive. The time of death was 1118.

An autopsy was conducted on July 16, 2008, by the Genesee County Medical Examiner, Flint, Michigan. The stated cause of death was “Blunt Force Injuries Due to an Airplane Crash.” The toxicology report was negative for all substances tested.

Pilot Information

Certificate:	Private	**Age:**	60,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:	Sport pilot	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	209 hours (Total, all aircraft), 41 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Drochak	**Registration:**	N621CD
Model/Series:	Aventura II	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	AA2A0130
Landing Gear Type:	Tricycle; Amphibian	**Seats:**	2
Date/Type of Last Inspection:	July 21, 2007 Condition	**Certified Max Gross Wt.:**	1430 lbs
Time Since Last Inspection:	47 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	47 Hrs at time of accident	**Engine Manufacturer:**	Rotax
ELT:	Installed, not activated	**Engine Model/Series:**	912ULS
Registered Owner:	Clifford Drochak	**Rated Power:**	100 Horsepower
Operator:	Clifford Drochak	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FNT,782 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	23°C / 12°C
Precipitation and Obscuration:			
Departure Point:	Flushing, MI (3DA)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	10:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Dalton Airport 3DA	**Runway Surface Type:**	Grass/turf
Airport Elevation:	733 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	09	**IFR Approach:**	None
Runway Length/Width:	1633 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	43.052501,-83.804725(est)

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Phil Bolyard; FAA Detroit FSDO; Belleville, MI
Original Publish Date:	December 29, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68748