Aviation Investigation Final Report

Location:	Ray, Michigan	**Accident Number:**	CEN12LA149
Date & Time:	February 4, 2012, 11:20 Local	**Registration:**	N325MZ
Aircraft:	Pipistrel Virus 912	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A witness reported that the motorglider engine did not sound normal during the preflight run-up and takeoff. The engine subsequently lost power when the aircraft was about 200 feet above ground level. The motorglider took off to the west and entered a gradual left turn. It impacted a golf course less than a mile from the airport. The duration of the accident flight was about 2 minutes. A postaccident examination revealed an accumulation of debris on the inlet side of the fuel pump screen; however, the debris did not appear to obstruct the screen significantly. The appearance of the debris was similar to the fiberglass material used in the construction of the airframe. The fuel tanks had been repaired shortly before the accident due to damage related to the use of alcohol-containing fuel (ethanol). The engine fuel line did not contain any fuel and the carburetors contained only a minimal amount of fuel.

Although the finding of minimal fuel at the engine was consistent with fuel starvation, a definitive reason for a starvation event could not be determined. According to a carburetor icing probability chart, an airplane operating in the ambient conditions at the time of the accident could expect a serious risk of carburetor icing while at cruise and glide power. Engine operations at low power during ground operations are similar to that of operations at glide power, making the carburetor susceptible to icing prior to takeoff; however, a conclusive determination related to the presence of carburetor icing was not possible. A prescription medication commonly used for the management of anxiety disorders and for insomnia was detected at subtherapeutic levels. However, any impairment of the pilot at the time of the accident could not be 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 due to fuel starvation for reasons that could not be determined because the postaccident examination of the airframe and engine did not reveal any anomalies that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)

HISTORY OF FLIGHT

On February 4, 2012, at 1120 eastern standard time, a Pipistrel Virus 912 motorglider, N325MZ, was substantially damaged during a forced landing following a loss of engine power shortly after takeoff from Ray Community Airport (57D), Ray, Michigan. The pilot sustained fatal injuries. The aircraft was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The local flight originated from 57D at 1118.

A witness reported that the motorglider engine did not sound as if it was operating normally during the preflight run-up. He added that the engine sounded as if it was "missing" during takeoff, and it subsequently quit when the aircraft was about 200 feet above ground level (agl) after takeoff. He observed the motorglider climbing and descending during the glide prior to the forced landing. He lost sight of the aircraft when it descended below the trees.

Global positioning system (GPS) data related to the accident flight indicated that the motorglider departed runway 27 at 1118. Subsequent position data depicted the motorglider in a gradual left turn southwest of the airport. The final GPS data point was logged at 1120:19 (hhmm:ss) and located about 0.9 miles southwest of the initial data point at the arrival end of runway 27. GPS altitude data depicted the motorglider as high as 822 feet, about 200 feet agl, before it began to descend. The GPS altitude associated with the final data point was 674 feet. The elevation of the runway 27 threshold was 626 feet. The accident site was located on a golf course, about 325 feet south-southeast of the final GPS data point at an approximate elevation of 618 feet.

The motorglider impacted a golf course within 1 mile of the airport. The pilot was transported from the scene in critical condition and subsequently died from injuries received during the accident.

PERSONNEL INFORMATION

The accident pilot held a private pilot certificate with single-engine land airplane and glider ratings. The pilot's most recent application for an airman medical certificate, dated October 5, 2006, was denied. On that application, the pilot indicated a total flight time of 2,433 hours, with 61 hours acquired during the previous 6 months. The pilot's most recent flight review was completed on April 30, 2010.

The pilot's son reported that the pilot had discarded his logbook covering powered aircraft flight time when his medical certificate was denied. The pilot's flight time in gliders was estimated to be about 340 hours.

Regulations [14 CFR 16.23(b)(3)] do not require a person exercising the privileges of a pilot certificate with a glider category rating to hold a medical certificate when operating a glider.

AIRCRAFT INFORMATION

The accident aircraft was a 2007 Pipistrel Virus 912 motorglider, serial number 251VSW9121207. The motorglider was a two-place, high-wing monoplane, with a T-tail empennage and tri-cycle landing gear configuration. Significant portions of the airframe were constructed of composite (fiberglass) materials. The motorglider was powered by an 80-horsepower Rotax 912UL engine.

The accident motorglider was imported to the United States and sold to the accident pilot in December 2007. The motorglider was issued an experimental exhibition glider airworthiness certificate on June 4, 2008. The airworthiness certificate application noted a total of 2 hours on the airframe at that time.

Maintenance records revealed that the most recent inspection was completed on January 11, 2012, at a recording tachometer time of 298 hours. A maintenance entry dated June 25, 2011, indicated that the left and right fuel tanks were repaired due to damage caused by automotive fuel containing ethanol. The recording hour meter reportedly indicated 287 hours at that time. The repair was accomplished in accordance with Pipistrel Special Repair Instruction S.RI 02.r1 (March 5, 2011). The repair involved removing a portion of the upper wing skins in order to access and seal the fuel tanks. The motorglider had been operated about 11 hours since the fuel tank repair.

The Flight Manual stated that the use of fuel with alcohol content is not permitted. The repair instruction provided for the repair and internal protection of semi-integral wing fuel tanks that had been damaged by alcohol blended fuels (ethanol, methanol).

A representative of the manufacturer stated that additional in-line fuel filters are installed after the fuel tank repair in order to retain any residual debris. These filters are normally removed after 5 flight hours, and they were not installed at the time of the postaccident examination. Maintenance records available to the NTSB did not contain an entry denoting installation or removal of the additional filters.

METEOROLOGICAL INFORMATION

Weather conditions at the Selfridge Air National Guard Base, located about 8 miles southeast of 57D, at 1055, were: Wind from 050 degrees at 3 knots; visibility 10 miles; scattered clouds

at 12,000 feet agl; broken clouds at 15,000 feet agl; broken clouds at 18,000 feet agl; temperature 2 degrees Celsius; dew point -1 degrees Celsius, altimeter 30.28 inches of mercury.

At 1155, weather conditions at 57D were: Wind from 090 degrees at 4 knots; visibility 10 miles; few clouds at 3,500 feet agl; scattered clouds at 12,000 feet agl; broken clouds at 17,000 feet agl; temperature 3 degrees Celsius; dew point -2 degrees Celsius, altimeter 30.26 inches of mercury.

FAA guidance related to carburetor icing noted a possibility of serious icing at cruise power under the recorded temperature/dew point conditions.

WRECKAGE AND IMPACT INFORMATION

The motorglider impacted a golf course about 0.9 miles southwest of the airport. The main wreckage, which included the fuselage, engine and left wing, came to rest on a paved golf cart path. The right wing and empennage had separated from the fuselage and were located adjacent to the main wreckage. The forward portion of the fuselage was fragmented and the cockpit area was compromised. The engine was dislocated from the airframe, but remained partially attached to the firewall. The right cockpit door had separated. It came to rest adjacent to a ground impact scar located about 75 feet north of the main wreckage. One propeller blade had separated near the hub and was located about 125 feet north of the main wreckage. The second propeller blade remained attached.

The right flaperon was separated from the wing and located at the accident site. The left flaperon remained attached to the left wing. The rudder and elevators remained attached to the empennage. Flight control continuity was confirmed at the rudder and elevators. Discontinuities in the remainder of the flight control system appeared consistent with separations due to the impact sequence.

A postaccident teardown examination of the engine was conducted under the direct supervision of a Federal Aviation Administration inspector. The examination did not reveal any anomalies related to the cylinders, crankshaft, or valve train. The fuel pump had separated from the engine during the accident sequence and could not be actuated by hand. Teardown examination of the fuel pump revealed an accumulation of debris on the inlet side of the internal pump screen. However, the debris did not appear to significantly obstruct the screen. The debris was similar in appearance and texture to the fiberglass material used in the construction of the composite airframe. The gascolator also contained a minor amount of debris. The carburetors and fuel lines appeared to be free of any debris. The fuel line between the fuel pump and manifold did not contain any fuel when disconnected during the exam. The carburetor float bowls contained only a minimal amount of fuel. Approximately 5 gallons of fuel was recovered from the fuel tanks after the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed on February 6, 2012. The pilot's death was attributed to multiple injuries sustained in the accident.

The FAA Civil Aerospace Medical Institute toxicology report noted:
50.46 (UG/ML, UG/G) Acetaminophen detected in Urine
Lidocaine detected in Urine
Lidocaine detected in Blood
1.128 (ug/mL, ug/g) Lorazepam detected in Urine
0.058 (ug/mL, ug/g) Lorazepam detected in Blood
45.985 (ug/ml, ug/g) Morphine detected in Urine
0.215 (ug/ml, ug/g) Morphine detected in Blood
Propofol detected in Urine
Propofol detected in Blood
156 (mg/dl) Glucose detected in Urine
Glucose NOT detected in Vitreous
5.8 (%) Hemoglobin A1C detected in Blood

The pilot's son stated that the pilot had some difficulty with his eye sight and had been looking for a magnifying sheet to place over the aircraft multi-function display in order to make it easier to read. The pilot also reportedly had some issues with his hearing. In addition, a noise reduction headset was observed with the pilot at the accident site.

Acetaminophen is an over-the-counter analgesic medication, sold under the trade name Tylenol, commonly used to treat pain and fever. Morphine, Lidocaine, and Propofol are commonly used in hospital emergency treatment settings. Lorazepam is a prescription medication commonly used for the management of anxiety disorders and for insomnia. The medication was detected at sub-therapeutic levels.

ADDITIONAL INFORMATION

The Rotax engine installation manual noted the presence of an electric fuel pump in the standard installation schematic. The accident motorglider was not equipped with an electric fuel pump. A representative of the manufacturer stated that Rotax does not require use of an electrical fuel pump in conjunction with the engine integrated mechanical fuel pump when the fuel is gravity fed from the wing tanks.

Pilot Information

Certificate:	Private	**Age:**	78,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:	None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 30, 2010
Flight Time:	2433 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Pipistrel	**Registration:**	N325MZ
Model/Series:	Virus 912	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	251VSW9121207
Landing Gear Type:		**Seats:**	2
Date/Type of Last Inspection:	January 11, 2012 Annual	**Certified Max Gross Wt.:**	1290 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	298 Hrs as of last inspection	**Engine Manufacturer:**	Rotax
ELT:	Installed	**Engine Model/Series:**	912UL
Registered Owner:	On file	**Rated Power:**	80 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:	MTC,580 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	11:55 Local	**Direction from Accident Site:**	163°
Lowest Cloud Condition:	Few / 3500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 17000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.26 inches Hg	**Temperature/Dew Point:**	3°C / -2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ray, MI (57D)	**Type of Flight Plan Filed:**	None
Destination:	Ray, MI (57D)	**Type of Clearance:**	None
Departure Time:	11:18 Local	**Type of Airspace:**	

Airport Information

Airport:	Ray Community 57D	**Runway Surface Type:**	Asphalt
Airport Elevation:	632 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	2494 ft / 60 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:**	42.729442,-82.900558

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Richard D Anderson; FAA – East Michigan Flight Standards; Belleville, MI
Original Publish Date:	January 15, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=82819