Aviation Investigation Final Report

Location:	WARREN, Idaho	**Accident Number:**	WPR14FA330
Date & Time:	August 5, 2014, 14:55 Local	**Registration:**	N32FZ
Aircraft:	DAVID FITZGERALD ZENITH	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and a passenger were conducting cross-country flights across multiple days in remote mountainous areas. Data downloaded from the airplane's multifunction display showed, for the accident leg, a flight track that meandered from the last departure point toward the day's intended destination, which was about 19 nm northwest of the accident site. The track followed the contour of the area's mountainous terrain, was not a direct route, and had many turns and route reversals. The airplane's altitude remained mostly constant. In the last minute of flight, the airplane was in a gradual climb, and the airspeed decreased from about 50 knots to the last recorded airspeed of about 35 knots. During the last few seconds of flight, the pitch became nose down, and the airplane rolled to a 90-degree angle. Onsite wreckage documentation indicated that the airplane collided with the sloping terrain in a nose-down attitude. It is likely that the pilot increased pitch to establish a climb angle to clear the terrain but inadvertently exceeded the airplane's critical angle-of-attack and entered a stall from which he was unable to recover.

The density altitude at the time of the accident was about 10,381 ft. Operation at a high density altitude can adversely impact airplane performance. Postaccident documentation of the wreckage and data downloaded from the airplane's multifunction display did not reveal evidence of a mechanical malfunction or failure that would have precluded normal operation.

Probable Cause and Findings

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

The pilot's failure to maintain adequate airspeed and his exceedance of the airplane's critical angle-of-attack while climbing to avoid terrain while operating at a high density altitude, which resulted in a stall at too low an altitude to allow recovery.

Findings

Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	High density altitude - Effect on operation
Environmental issues	Mountainous/hilly terrain - Contributed to outcome

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On August 5, 2014, about 1455 mountain daylight time (MDT), an experimental David Fitzgerald, Zenith CH750, N32FZ, crashed in mountainous terrain in the wilderness area of Warren, Idaho. The owner/pilot was operating the airplane under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The sport pilot and passenger were fatally injured; the airplane was destroyed by impact forces. The personal cross-country flight departed Big Creek, Idaho, about 1440 with a planned destination of Dixie, Idaho. Visual meteorological conditions prevailed, and no flight plan had been filed.

The pilot was in possession of a personal SPOT Global Positioning Satellite (GPS) satellite tracker unit. When the pilot failed to check in with his family, they logged into the SPOT tracker system, and determined the location of the accident site. The family contacted the Idaho County Sheriff's Department, who initiated search and rescue. The Federal Aviation Administration (FAA) issued a family concerned Alert Notice (ALNOT) on August 5, 2014, at 2326 MDT.

The airplane wreckage was located on August 6, 2014.

The family reported that the pilot and passenger were making a multi-day cross country flight in the backwoods remote areas of Idaho. On the accident date, the pilot was to send a message via the SPOT locator upon arrival to Dixie. The purpose of the multi-day flights was to sightsee and enjoy the back country.

PERSONNEL INFORMATION

A review of FAA airman records revealed that that the 57-year-old pilot held a sport pilot certificate with a rating for airplane single-engine land, which was issued December 7, 2012.

The sport pilot did not hold a medical certificate nor was it required.

An examination of the pilot's personal logbook indicated that he had accumulated a total flight time of 414 hours. He logged 119 hours in the last 90 days, and 25 hours in the last 30 days. He had an estimated 377 hours in the accident make and model.

AIRCRAFT INFORMATION

The airplane was an experimental amateur built, David Fitzgerald, Zenith CH750, serial number 1001. A review of the pilot's flight logbook revealed that the airplane had a total airframe time of 377 hours at the time of the last flight.

No aircraft maintenance records were located for the accident airplane.

The airplane was issued a special airworthiness certificate as an experimental amateur built airplane on February 21, 2013.

METEOROLOGICAL INFORMATION

The nearest weather reporting station was McCall Municipal Airport (MYL), McCall, Idaho, located 37 nm southwest of the accident site.

A review of recorded weather data from the MYL automated weather observation station revealed at 1451 MDT conditions were; wind 340 degrees at 9 knots, temperature 29 degrees C, dew point 2 degrees C, and an altimeter setting of 29.91 inches of mercury. Using the reported weather conditions and accident elevation, the calculated density altitude was about 11,215 feet.

A review of the recorded weather data from the Dynon Skyview multi-function display indicated at 1454 MDT conditions were; wind 048 degrees at 8 knots, temperature 22 degrees C, and an altimeter setting of 30.00; pressure altitude was 7,698. Using the data from the Dynon, the density altitude was 10,381 feet.

WRECKAGE AND IMPACT INFORMATION

Investigators examined the wreckage at the accident scene. The accident site was located in a remote area of the Payette National Forest. The wreckage was positioned in the center of a previous wild land fire area of 70-80 foot tall trees, of which most were dead. The wreckage site was on a 20-25-degree slope facing south and contained in an area of 50 feet. The airplane impacted the ground in a steep nose down attitude. The first identified point of contact (FIPC) was an uprooted tree that had impact damage about 33 feet up from the base of the tree and lying within the main wreckage. The debris path was along a magnetic heading of 200 degrees. The orientation of the fuselage was 260 degrees. The wreckage was at an elevation of 7,907 feet mean sea level (msl).

The right wing separated from the fuselage, and was lying across the tail section. The left wing was still attached to the fuselage, with impact damage to the leading edge of the outboard section of the wing.

Flight control continuity could not be positively verified as a result of the impact damage. All control connections that were noted were intact and secured to their respective attachment points. A detailed examination to the cockpit area was not performed due to impact damage.

The airplane was equipped with a Dynon Skyview multi-function display system, which was recovered for further examination.

The accident site had a strong odor of aviation fuel. The fuel sump bowl was intact, and fuel was present when it was opened. There was no contamination found in the fuel sump bowl.

The airframe and engine were examined on scene with no mechanical anomalies identified.

At the time of the on scene examination, it was unknown if the wreckage would be recovered. Due to the weather and time constraints at the accident site, the examination of the wreckage was limited.

MEDICAL AND PATHOLOGICAL INFORMATION

The Idaho County Coroner completed an autopsy on August 11, 2014. The FAA Civil Aerospace Medical Institute (CAMI), Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot.

Analysis of the specimens contained no findings for carbon monoxide, cyanide, volatiles, and tested drugs.

TESTS AND RESEARCH

Two cell phones and an iPad tablet were recovered from the accident site. They were shipped to the National Transportation Safety Board (NTSB) Vehicle Recorder lab for download. No relevant data regarding the accident was recovered. A copy of the factual report is attached to the docket.

The wreckage was recovered under the direction of the family. The data recovered from the on board Dynon display revealed that the engine was operating without issue up until the point of impact.

SPOT TRACKER

The pilot carried a SPOT Tracker, which used satellite communications and the GPS system for location tracking. The SPOT tracker was recovered from the accident site, and appeared undamaged.

The SPOT tracker was configured such that while in tracking mode the unit would send its location information every 10 minutes unless the position was stationary; then it would default to every 60 minutes.

A review of the SPOT tracker data indicated the following times and locations of the flight on the day of the accident.

The pilot and passenger had departed on the third day of a multi-day flight into the back country of Idaho. On the day of the accident, they had departed from Sulphur Creek Ranch Airport (ID74), Cascade, Idaho, about 1100 MDT. All referenced times are MDT.

At 1129, the flight landed at Upper Loon Creek airstrip (U72), and departed at 1149.

At 1209, the flight landed at Lower Loon Creek airstrip (C53), and departed at 1309.

At 1419, the flight landed at Big Creek airstrip (U60), and departed at 1439. U60 is located 5 nm southeast of the accident site.

At 1600, the first track point received was located at the accident site. The track points continued to be received in the area of the accident site until 2230 when the batteries were depleted.

DYNON SKYVIEW MULTIFUNCTION DISPLAY

The Dynon MFD recorded data from the accident flight, which included engine parameters, aerodynamic parameters, and meteorological data.

The downloaded data was reviewed, and a copy of the data report is attached to the docket for this accident. The last several minutes prior to the accident indicated no mechanical malfunctions or failures with the engine systems that would have precluded normal operation.

The recorded flight track was a meandering track from the last departure point towards the day's intended destination, which was about 19 nm northwest of the accident site. The track was following the contour of the area's mountainous terrain. The track was not in a direct route, and had many turns and route reversals. The altitude remained mostly constant as the track moved up the canyon.

A review of the data showed in the last minute of flight the airplane was in a gradual climb, and the airspeed was decreasing from about 50 knots to the last recorded airspeed of about 35 knots. During the last few seconds of flight, the pitch angle increased nose down, and the airplane rolled to a 90-degree angle.

Pilot Information

Certificate:	Sport Pilot	**Age:**	57
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Sport pilot None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 7, 2012
Flight Time:	(Estimated) 414 hours (Total, all aircraft)		

Passenger Information

Certificate:		**Age:**	61
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	DAVID FITZGERALD	**Registration:**	N32FZ
Model/Series:	ZENITH CH750	**Aircraft Category:**	Airplane
Year of Manufacture:	2013	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	1001
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	UL
ELT:	Not installed	**Engine Model/Series:**	350 IS
Registered Owner:	On file	**Rated Power:**	
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:	KMYL,5020 ft msl	**Distance from Accident Site:**	37 Nautical Miles
Observation Time:	20:51 Local	**Direction from Accident Site:**	239°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	29°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Big Creek, ID (U60)	**Type of Flight Plan Filed:**	VFR
Destination:	Dixie, ID (A05)	**Type of Clearance:**	None
Departure Time:	14:39 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	45.210277,-115.359443

Preventing Similar Accidents

Mastering Mountain Flying (SA-039)

The Problem

Pilots with limited or no training in mountain flying can be surprised about their aircraft's different performance at high density altitude, often leading to serious or fatal accidents. Wind and other weather phenomena interacting with mountainous terrain often lead unsuspecting pilots into situations that are beyond their capabilities.

Should a crash occur, a pilot who survives the crash but does not have emergency or survival gear immediately accessible may not survive the harsh environment until rescuers are able to reach the location.

What can you do?

Through training, pilots can develop skills and techniques that will allow them to safely fly in mountainous terrain. When planning flights in mountainous terrain, pilots and flight instructors should do the following to enhance safety:

- Flight instructors should encourage their students to attend a quality mountain flying course before attempting flight in mountainous terrain or at high density altitudes.

- Pilots should consult with local flight instructors before planning a flight into mountainous terrain. Even experienced mountain pilots may not be familiar with local conditions and procedures for safe operations.
- Pilots should be aware that weather interacting with mountainous terrain can cause dangerous wind, severe turbulence, and other conditions that may be unsafe for aircraft, especially light GA aircraft.
- Pilots should consider specialized emergency and survival equipment (such as personal locator beacons in addition to a 406 emergency locator transmitter) before flying in mountainous terrain, and develop a plan for immediate access to the equipment in the event of a postaccident fire.
- FBO staff should be alert for customers who appear to be planning flight into mountainous terrain who could benefit from mountain flying instruction.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-039.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Jones, Patrick
Additional Participating Persons:	COLBY BARRON; Federal Aviation Administration; Spokane, WA
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89809