National Transportation Safety Board
Aviation Accident Final Report

Location:	South Lake Tahoe, CA	**Accident Number:**	WPR16FA007
Date & Time:	10/10/2015, 1735 PDT	**Registration:**	N4485D
Aircraft:	BEECH G35	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The private pilot and passenger were departing on a personal cross-country flight. During takeoff, witnesses observed that the airplane was struggling to gain altitude and noted that the engine sounded as if it was not producing adequate power. They added that, as the airplane crossed over the airport boundaries, it climbed to about 100 ft above ground level in an excessively high pitch-up attitude. Shortly thereafter, the airplane crossed a ridgeline, entered a nose- and left-wing-low attitude, and impacted the backyard of a residence.

While ceiling and visibility were not an issue in this accident, the wind magnitude and changes in wind direction likely affected the flight. Wind gusts were as high as 26 knots around the accident time, and weather observation sites within 3 miles of the accident site all reported large changes in wind direction around the accident time. Although the wind was mainly from the south to southwest, there were times when the wind came from the west and north. This change in wind direction was likely due to mountain wave conditions and wind flow over the mountainous terrain, and these changes in wind direction and gusts likely affected the accident flight and the pilot's ability to control the airplane.

Wreckage and impact signatures were consistent with a left-wing-low and nose-low impact. Postaccident examination of the airframe, flight control system, and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. Based on the witness observations and the recorded weather data, it is likely that the airplane encountered a downdraft that exceeded the airplane's climb performance, which resulted in the airplane exceeding its critical angle-of-attack and a subsequent aerodynamic stall.

An area forecast, issued about 5 hours before the accident, forecasted southwest wind at 20 knots with gusts to 30 knots for the time surrounding the accident. A terminal aerodrome forecast issued 1 hour before the accident, forecasted wind from 190 degrees at 11 knots gusting to 20 knots. However, there is no evidence that the pilot obtained weather information before the flight, thus he may not have been aware of the gusting wind conditions that affected the flight.

Probable Cause and Findings

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

The pilot's inability to maintain airplane control due to an encounter with a downdraft that exceeded the airplane's climb performance capabilities and resulted in an aerodynamic stall. Contributing to the accident was the pilot's decision to depart without obtaining a weather briefing.

Findings

Aircraft	Climb capability - Capability exceeded (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Decision making/judgment - Pilot (Factor)
Environmental issues	Downdraft - Effect on operation (Cause)

Factual Information

History of Flight

Enroute-climb to cruise	Turbulence encounter
	Loss of control in flight (Defining event)
	Collision with terr/obj (non-CFIT)

On October 10, 2015 about 1735 Pacific daylight time, a Beech G35, N4485D, was destroyed when it impacted terrain during initial climb near South Lake Tahoe, California. The private pilot, who was the registered owner of the airplane, and the passenger sustained fatal injuries. The flight was conducted under the provisions of 14 Code of Federal Regulations (CFR) Part 91 as a personal cross-country flight. Visual meteorological conditions (VMC) prevailed at the time of the accident, and no flight plan had been filed. The flight originated from Lake Tahoe Airport (TVL), South Lake Tahoe, California, about 1733.

During takeoff from runway 18, witnesses located at the airport, observed the airplane oscillating in altitude at about 30 feet over the runway. A couple of witnesses reported that the engine sounded as if it was not producing an adequate amount of power. One witness reported that, at about mid-point on the runway, the airplane appeared to have entered some turbulent air; the left wing dipped but the pilot regained control. As the airplane exited the airport boundaries on the runway heading, it made a right turn followed by a left turn to an east-northeast heading. It climbed to about 100 feet above ground level (agl) in an excessively high pitch up attitude, and continued to fly towards the rising terrain. Shortly thereafter, after it crossed a ridgeline east of the airport, the airplane entered a nose and left-wing low attitude and impacted the back yard of a residence.

Pilot Information

Certificate:	Private	**Age:**	73
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without Waivers/Limitations	**Last FAA Medical Exam:**	03/10/2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 1580 hours (Total, all aircraft), 158 hours (Total, this make and model), 1534 hours (Pilot In Command, all aircraft)		

The pilot, age 73, held a private pilot certificate with an airplane single-engine land and multi-engine land ratings. A third class airman medical certificate was issued to the pilot on March 10, 2015, with no limitations. During the last medical exam, the pilot reported flight experience that included 1,600 total flight hours and 25 hours in last six months. However, the pilot's logbook revealed that as of the most recent logbook entry dated October 7, 2015, he had accumulated a total of 1,580.43 hours of total flight time.

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	**Registration:**	N4485D
Model/Series:	G35 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	1956	**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	D-4641
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	03/21/2015, Annual	**Certified Max Gross Wt.:**	2775 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5935.46 Hours as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:		**Engine Model/Series:**	E-225-8
Registered Owner:	On file	**Rated Power:**	185 hp
Operator:	On file	**Operating Certificate(s) Held:**	None

The four-seat, single-engine, low-wing, retractable landing gear airplane, serial number D-4641, was manufactured in 1956. It was powered by a Continental Motors E-225-8 engine, serial number 31362-D-6-8, rated at 225 horsepower. The airplane was also equipped with a McCauley two bladed adjustable pitch propeller. A review of maintenance records showed that the most recent annual inspection was completed March 21, 2015, at a total aircraft time of 5,935.46 hours, and the engine time since major overhaul of 211.46 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	KTVL, 6314 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	1653 PDT	**Direction from Accident Site:**	4°
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 21 knots	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	21°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	South Lake Tahoe, CA (TVL)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	1730 PDT	**Type of Airspace:**	Class G

A NTSB staff meteorologist prepared a factual report for the area and timeframe surrounding the accident.

The National Weather Service (NWS) Surface Analysis Chart for 1700 depicted a surface trough surface trough near the accident site that would have promoted a change in wind direction over the mountainous terrain with time. The NWS Storm Prediction Center (SPC) Constant Pressure Chart for 700-hPa Chart for 1700 depicted a west to southwest wind of 20 to 30 knots moving over the higher terrain at and around the accident site. Similar wind values were observed at 500-hPa, with the wind increasing in speed to 50 knots by 300-hPa out of the west to northwest wind direction

An Automated Surface Observing System (ASOS) located at TVL reported at 1653, wind from 210 degrees at 13 knots with gusts to 21 knots, wind direction variable between 180 degrees and 260 degrees, 10 miles visibility, sky clear below 12,000 feet agl, temperature of 23 degrees Celsius (C), dew point temperature of 0 degrees C, and an altimeter setting of 30.21 inches of mercury. Remarks: automated station with a precipitation discriminator, peak wind from 200 degrees at 26 knots at 1638, sea level pressure 1018.6hPa, temperature 22.8 degrees C, dew point temperature 0 degrees, 6-hourly maximum temperature of 25.6 degrees C, 6-hourly minimum temperature of 22.8 degrees, 3-hourly pressure change of 0.9 hPa.

At 1753, TVL reported wind from 210 degrees at 9 knots with gusts to 18 knots, 10 miles visibility, clear sky below 12,000 feet agl, temperature of 21 degrees C, dew point temperature of 2 degrees C, and an altimeter setting of 30.21 inches of mercury. Remarks: automated station with a precipitation discriminator, sea level pressure 1018.9 hPa, temperature 21.1 degrees C, dew point temperature 2.2 degrees C.

The one-minute TVL ASOS surface data was provided by the NWS for the time surrounding the accident.

At 1734 PDT, KTVL reported the two-minute average wind from 209° at 12 knots and a five-second maximum average wind from 199° at 19 knots.

At 1735 PDT, KTVL reported the two-minute average wind from 211° at 13 knots and a five-second maximum average wind from 220° at 20 knots.

At 1736 PDT, KTVL reported the two-minute average wind from 219° at 11 knots and a five-second maximum average wind from 218° at 13 knots.

At 1737 PDT, KTVL reported the two-minute average wind from 211° at 9 knots and a five-second maximum average wind from 197° at 18 knots.

In addition to the official surface observation site above, there were an additional non-official surface observations sites reporting around the accident site at the accident time.

EW3758 Meyers (EW3758) station was the closest non-official surface observation site to the accident site located 1 mile west-northwest of the accident site at an elevation of 6,300 feet. EW3758 reported gusty surface winds surrounding the accident time with a 7 mph wind gusting to 15 mph from the north at 1730. The wind magnitude was similar during the observations surrounding the accident time, however, the wind direction was variable between 272 degrees and 355 degrees.

RWBC1 was a remote automatic weather station (RAWS) station located 1 mile west-southwest of the accident site at an elevation of 6,336 feet agl. RWBC1 reported a wind from 228 degrees to 213 degrees around the accident time with the wind magnitude between 5 and 8 mph with gusts to 17 to 19 mph at 1651 and 1751.

CF047 was a California Transportation station located 3 miles south-southwest of the accident site at an elevation of 7,390 feet agl. CF047 reported a wind from 205 degrees at 1.9 mph with gust to 18.6 mph at 1731. The wind remained quite gusty at CF047 around the accident time with large changes in wind direction from 65 degrees to 255 degrees to 145 degrees. These changes in wind direction were likely the result of the wind flow over the terrain and mountain wave activity around and near the top of the terrain.

The closest official upper air sounding to the accident site was from Reno, Nevada, (REV), located 43 miles north-northeast of the accident site, at an elevation of 4,970 feet. The 1700 REV sounding indicated a relatively dry environment from the surface through 15,000 feet mean sea level (msl).

The sounding wind profile indicated a surface wind from 235 degrees at 18 knots with the wind increasing to 25 knots while remaining southwesterly through 6,000 feet msl.

An area forecast, issued at 1245, forecasted scattered cirrus clouds with a gusty-southwest wind 20 knots gusts to 30 knots until 2000.

Terminal Aerodrome Forecast issued at 1635, forecasted wind from 190 degrees at 11 knots gusting to 20 knots, greater than 6 miles visibility, and few clouds at 22,000 feet agl.

A search of official weather briefing sources, such as Lockheed Martin Flight Service (LMFS) and Direct User Access Terminal Service (DUATS), did not reveal the pilot received a weather briefing prior to departure. There is no knowledge of any additional weather briefing information the accident pilot received.

The complete weather report is appended to this accident in the public docket.

Airport Information

Airport:	LAKE TAHOE (TVL)	**Runway Surface Type:**	N/A
Airport Elevation:	6269 ft	**Runway Surface Condition:**	Dry; Vegetation
Runway Used:	N/A	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

According to the FAA Airport/Facility Directory information, LTV was a non-towered airport that was equipped with a single paved runway, designated 18/36, and airport elevation was 6,254.8 feet above msl.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	38.865833, -119.998056 (est)

The accident site was located in the back yard of a private residence about 1 mile south from TVL. The airplane wreckage was spread along a 140 feet-long path on a 080-degree magnetic heading. The first point of impact was a pine tree at about 100 feet agl. It exhibited a 45 degree angle cut which is consistent with a propeller blade strike. The left wing and the aft fuselage/ empennage were separated from the fuselage. The left wing was located about 108 feet from the initial point of impact; the aft fuselage/empennage were located about 150 feet from the initial point of impact. The left and right stabilizer and ruddervators remained attached to the empennage. The outboard portion of the right wing was separated and located on a tree adjacent to the empennage.

The main wreckage, which consisted of the airplane's cabin, the inboard portion of the right wing, both main landing gear, baggage compartment and forward fuselage, was resting oriented on a 220 degrees heading. These components were charred, melted, and consumed by fire.

Flight control continuity was established from the cockpit controls throughout to all primary flight control surfaces. Multiple separations were observed in various control cables, consistent with impact.

The engine and the propeller hub with one blade attached were found inverted a few feet from the main wreckage. The attached blade curled 360 degrees, creating a hook-like shape. The opposing propeller blade was located 54 feet at 011 degrees from the main wreckage. The blade exhibited blade tip twisting/curling and the chordwise scratches or striations.

The engine was separated from the airframe and exhibited signatures of thermal and impact damage.

Mechanical continuity was established throughout the engine and valve train when the propeller was rotated by hand. Thumb compression was obtained on all six cylinders when the propeller was rotated by hand.

The top and bottom spark plugs exhibited signatures consistent with normal operation. The spark plugs exhibited varying degrees of coloration within the electrode area consistent with corrosion and from the post impact fire.

Both magnetos remained attached to the engine via their respectable mounts. When the crankshaft was rotated, both magnetos produced spark on all ignition leads in proper firing order.

The fuel injection servo was separated from the engine. The fuel inlet screen was obstructed with contaminants which were a result of the thermal damage.

The induction system remained intact and exhibited impact damage. The exhaust risers remained attached to their respective cylinders and sustained thermal and impact damage. The exhaust muffler and the outflow pipe exhibited signatures consistent with thermal and impact damage.

No evidence of any preexisting mechanical malfunction was found that would have precluded normal operation.

For further information, see the Accident Site, Airframe, and Engine Exam Summary Report within the public docket for this accident.

Medical And Pathological Information

An autopsy was performed on the pilot October 12, 2015, by the El Dorado Pathology Medical Group, Placerville, California. The cause of death was determined to be "extensive blunt force thoracic trauma".

The FAA Civil Aeromedical Institute (CAMI) in Oklahoma City, Oklahoma performed toxicology on specimens from the pilot. Specimens tested negative for carbon monoxide and ethanol in blood. No presence of amphetamines, opiates, marihuana, cocaine, phencyclidine, benzodiazepines, barbiturates, antidepressants, and antihistamines was detected in the blood.

Administrative Information

Investigator In Charge (IIC):	Maja Smith	**Report Date:**	01/31/2017
Additional Participating Persons:	Michael Shurtleff; FAA Peter Basile; Textron Aviation Kurt Gibson; Continental Motors		
Publish Date:	01/31/2017		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=92151		