Aviation Investigation Final Report

Location:	Lexington, Texas	**Accident Number:**	CEN15FA427
Date & Time:	September 27, 2015, 18:30 Local	**Registration:**	N3921D
Aircraft:	Cessna 182	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Skydiving		

Analysis

The commercial pilot was returning the airplane to the departure airport for landing after a skydiving flight. Two witnesses reported observing the pilot fly the airplane over the runway; one witness said it was about 50 ft above ground level (agl), and the other witness said it was about 100 ft agl. One of the witnesses added that, when the airplane reached the end of the runway, it pitched up about 45 degrees, gained about 200 ft of altitude, and then entered a turn with a 45-bank angle. The witness added that, after the airplane had turned about 90 degrees to a westerly heading, its nose dropped, and the airplane "immediately dove." The airplane subsequently entered a left spin and rotated about 180 degrees before impacting trees and then the ground. A second witness noted that the engine sounded like it was at "full throttle" during the descent as if the pilot was attempting to recover from the dive.

A postaccident examination of the airframe and engine revealed no preimpact mechanical failures or malfunctions. The airplane wreckage was confined to the vicinity of the accident site. Tree breaks in the immediate vicinity of the accident site were consistent with a high-angle descent immediately before impact. Based on the witness statements, it is likely that the pilot intentionally initiated a turning climb but failed to maintain adequate airspeed and exceeded the airplane's critical angle-of-attack, which resulted in an aerodynamic stall/spin from which he could not recover.

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 during a climbing turn, which resulted in an aerodynamic stall/spin at too low of an altitude to recover.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained

Factual Information

History of Flight

Approach-VFR pattern downwind	Aerodynamic stall/spin
Approach-VFR pattern downwind	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT
On September 27, 2015, about 1830 central daylight time, a Cessna 182A airplane, N3921D, was substantially damaged during an in-flight collision with trees and terrain near Lexington, Texas. The pilot sustained fatal injuries. The aircraft was registered to and operated by Austin Skydiving Center, Inc. under the provisions of 14 Code of Federal Regulations Part 91 as a part of a skydiving flight operation. Day visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The local flight originated from the Lexington Airfield (TE75), Lexington, Texas, about 1800.

A witness, who was one of the skydivers onboard the initial portion of the accident flight, reported that the flight to the jump altitude of 10,000 feet was "routine." After exiting the airplane, his parachute descent was uneventful. After his parachute landing, he observed the airplane overfly the runway northbound about 50 feet above ground level (agl). When the airplane reached the north end of the runway, it pitched up about 45 degrees. Once the airplane had gained about 200 feet of altitude, it entered a left 45-degree banked turn. After it had completed about 90 degrees of the turn, to a westerly heading, the nose dropped and it "immediately dove." The airplane subsequently entered a left spin, rotating about 180 degrees before impacting the ground. He estimated that 1-1/2 to 2 seconds elapsed from the time the nose dropped until the airplane impacted the ground.

A second witness reported that he was on the back porch of his home at the time of the accident. He recalled hearing the airplane for 5 to 10 seconds before seeing it. He added that it approached from the north and sounded "loud," which drew his attention toward the airplane. He noted that the engine "sounded like it was at full throttle" as if the pilot was attempting to recovery from the dive. His view of the airplane was initially obscured by the house roof and the trees. Once he saw the airplane it was nose down, descending toward a wooded area behind his home. He noted that the airplane appeared to be intact, with both wings and the tail visible. The airplane subsequently impacted the trees.

A third witness reported that the accident occurred on the last or second to last flight of the day. After the skydivers had landed, the jump airplane approached the runway and appeared to be in a position to land. However, as the airplane neared the runway, it leveled off about 100 feet above the ground and overflew the runway. The airplane crossed over approximately perpendicular to the main road passing the airport. Shortly after crossing the road, he observed the airplane enter a left turn, expecting it to complete the turn and return for a landing. However, before it completed the turn, the airplane seemed to lose its momentum and the nose dropped abruptly.

Another skydiver, who had been onboard the initial portion of the accident flight, reported that the takeoff and the subsequent climb to the jump altitude was "not noteworthy at all". He did not observe the airplane after he exited until he saw it at the accident site. He commented that they had started about 1000 that morning, and had been skydiving for most of the day. He estimated there had been about 10 or 11 airplane loads of skydivers during that timeframe. He added that the airplane was refueled immediately before the accident flight.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with single-engine land and instrument airplane ratings, which was issued on November 1, 2014. He was issued a first class airman medical certificate with a restriction for corrective lenses on January 13, 2015.

A review of the pilot's logbook revealed that his most recent flight entry was dated September 25, 2015; two days before the accident. He had logged 862.0 hours total flight time, including 846.2 hours in single-engine land airplanes and 605.5 hours in Cessna model 182 airplanes. Of the total flight time, 780.8 hours were logged as pilot-in-command and 238.2 hours were logged as dual instruction received. The pilot's logbook included endorsements for complex and high performance airplane operations.

A colleague of the accident pilot described him as a "skilled pilot." The colleague added that he had felt safe when flying with the accident pilot, more so than other pilots he had flown with in the past.

AIRCRAFT INFORMATION

The accident airplane was a Cessna model 182A (s/n 18234621). The Cessna 182A is a single-engine, four-place design, with a fixed tricycle landing gear arrangement. It was powered by 230-horsepower Continental Motors O-470-L six-cylinder, reciprocating engine (s/n 67911-7-L). Thrust was provided by a two-blade McCauley model 2A34C203-C/G-90DCA-8 constant speed (variable pitch) propeller assembly (s/n 010632).

According to maintenance records, the most recent annual inspection was completed on June 30, 2015, at a recording tachometer time of 4,178.3 hours. An airframe logbook entry, dated August 25, 2015, indicated that the recording tachometer hour meter failed at 4,200 hours and that a recording hour (Hobbs) meter was installed, which indicated 0 hours at that time. The most recent inspection consisted of a 100-hour inspection completed on September 24, 2015. The airframe had accumulated about 4,282 hours total time. The recording hour (Hobbs) meter indicated 82.7 hours at that time.

The accident engine was overhauled in November 2011, at 3,058.7 hours total time. The overhauled engine was installed on the accident airframe on November 30, 2014, and subsequently accumulated 919.5 hours. According to the maintenance logbook, the engine was disassembled and inspected due to a propeller strike before installation on the accident airframe. At the time of the most recent 100-hour inspection, the engine had accumulated about 4,124 hour total time, with about 1,066 hours since overhaul. The propeller assembly had accumulated about 1,116 hours total time.

Two modifications related to parachute jumping (skydiving) had been made to the accident airplane. The first modification removed the right front and rear seats, and installed floor level seat belt brackets to accommodate four occupants in addition to the pilot. The second was related to a modification of the right cabin door to allow for the in-flight operation of the door for parachute jumping.

METEOROLOGICAL INFORMATION

Weather conditions recorded by the Giddings-Lee County Airport (GYB) Automated Weather Observing System (AWOS), located about 15 miles south of TE75, at 1835, were: wind from 120 degrees at 7 knots, 10 miles visibility, clear sky, temperature 27 degrees Celsius, dew point 19 degrees Celsius, and altimeter 29.87 inches of mercury.

Weather conditions recorded by the Caldwell Municipal Airport (RWV) AWOS, located about 15 miles northeast of TE75, at 1830, were: wind from 110 degrees at 6 knots, 10 miles visibility, clear sky, temperature 27 degrees Celsius, dew point 18 degrees Celsius, and altimeter 29.87 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted trees and terrain about one-quarter mile north-northwest of TE75. The accident site was located in a wooded area, on the slope of an embankment surrounding a small pond. Tree breaks in the immediate vicinity of the accident site were consistent with a high angle of descent prior to impact. One tree limb, approximately 6 inches in diameter, was partially severed consistent with a propeller strike. The end of severed tree limb was oriented about 45 degrees relative to the horizon, which was consistent with an approximate 45-degree nose down airplane attitude. The airplane came to rest upright on the sloped side of the embankment and all wreckage was confined to the vicinity of the point of impact. All airplane structural components were located in the relative positions of an intact aircraft.

The nose and forward fuselage was deformed and fragmented consistent with impact forces. The engine was dislocated aft into the firewall to a point approximately in-line with the leading edge of the wings. The cockpit area was compromised and fragmented. The fuselage exhibited buckling and deformation in the vicinity of the aft cabin and baggage area. The empennage remained attached to the aft fuselage and appeared intact. The rudder and elevators remained attached to the vertical and horizontal stabilizers, respectively. Control continuity was confirmed from the rudder and elevators to the cockpit area. At the time of the postaccident examination, both cabin doors were separated and located adjacent to the fuselage.

The left wing was separated and located adjacent to the fuselage at the time of the postaccident examination. The forward spar and wing strut both exhibited cuts at the wing root and mid-span, respectively, consistent with a postaccident removal of the wing. Separation of the aft spar was consistent with an overload failure due to impact forces. The wing structure was deformed and the leading edge exhibited aft crushing along the entire span. The aileron and flap remained attached to the wing. Control continuity was confirmed from the aileron and the flap to the wing root.

The right wing remained attached to the fuselage. The wing structure was deformed, with aft crushing along the entire leading edge. The aileron and flap remained attached to the wing. The right aileron control tube was separated between the bellcrank and the control surface consistent with an overload failure. Control continuity was confirmed from the aileron bellcrank to the wing root. The aileron cross-over cable was separated inboard of the wing root; the separation appeared consistent with an overload failure. Control continuity of the right wing flap was confirmed to the wing root.

The engine sustained damage consistent with impact forces. All six cylinders remained attached to the crankcase. Internal engine and accessory section continuity were confirmed through crankshaft rotation. Suction and compression were noted at all cylinders. A lighted borescope examination of each cylinder

did not reveal any anomalies related to the individual cylinders, pistons, or intake/exhaust valves. The upper spark plugs exhibited normal combustion signatures. The left magneto was separated from the engine mounting pad; the right magneto remained secured to the engine. Both magnetos produced a spark across all leads when rotated. The carburetor housing was fractured consistent with impact forces. The fuel screen was intact and unobstructed.

The propeller separated from the engine due to a fracture of the propeller hub adjacent to the mounting flange. Both propeller blades remained with the forward portion of the hub, which was located near the engine at the accident site. The aft portion of the hub remained attached to the engine propeller flange. The appearance of the fracture surface was consistent with an overstress failure due to impact forces. The propeller blades exhibited minor bending and twisting over the span of the blade. One blade sustained minor scuffing damage in an area located about one-third span from the blade root and over the outboard one-third of the blade span.

The postaccident examination did not reveal any anomalies consistent with a preimpact failure or malfunction.

MEDICAL AND PATHOLOGICAL INFORMATION
An autopsy of the pilot was performed by the Travis County Medical Examiner's Office in Austin, Texas, on September 29, 2015. The pilot's death was attributed to blunt force injuries sustained as a result of the accident.

The FAA Civil Aerospace Medical Institute (CAMI) toxicology report noted:
No Ethanol detected in Vitreous;
Dextromethorphan detected in Liver;
Diphenhydramine detected in Liver;
Doxylamine detected in Liver.

Pilot Information

Certificate:	Commercial	**Age:**	32,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	January 1, 2015
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 1, 2014
Flight Time:	862 hours (Total, all aircraft), 605 hours (Total, this make and model), 780 hours (Pilot In Command, all aircraft), 342 hours (Last 90 days, all aircraft), 97 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3921D
Model/Series:	182 A	**Aircraft Category:**	Airplane
Year of Manufacture:	1957	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34621
Landing Gear Type:	Tricycle	**Seats:**	1
Date/Type of Last Inspection:	September 24, 2015 100 hour	**Certified Max Gross Wt.:**	2348 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4282 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed	**Engine Model/Series:**	O-470-L
Registered Owner:	Austin Skydiving Center, Inc.	**Rated Power:**	230 Horsepower
Operator:	Austin Skydiving Center, Inc.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GYB,484 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	18:35 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	27°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lexington, TX (TE75)	**Type of Flight Plan Filed:**	None
Destination:	Lexington, TX (TE75)	**Type of Clearance:**	None
Departure Time:	18:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Lexington TE75	**Runway Surface Type:**	Dirt;Grass/turf
Airport Elevation:	470 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	3300 ft / 150 ft	**VFR Approach/Landing:**	Full stop

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:**	30.4125,-96.966667(est)

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Peter B Brandon; FAA Flight Standards; Houston, TX Henry Soderlund; Cessna Aircraft Company; Wichita, KS Kurt Gibson; Continental Motors, Inc.; Mobile, AL
Original Publish Date:	May 2, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=92064