Aviation Investigation Final Report

Location:	Wellington, Texas	**Accident Number:**	CEN17FA080
Date & Time:	January 21, 2017, 14:20 Local	**Registration:**	N91Z
Aircraft:	Bellanca 7GCBC	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot was taking his cousin for an airplane ride. During takeoff, the airplane remained in ground effect until it reached a point near or past the departure end of the runway, and then it entered a right climbing turn. At an altitude of about 100 to 150 ft above ground level, the airplane entered a left turn with a bank angle that increased to about 80° to 90° before the airplane descended and impacted the ground. Wreckage distribution and ground scarring were consistent with a nose-down, low-speed, impact. It is likely that the excessive left bank angle resulted in the airplane exceeding its critical angle of attack and experiencing an aerodynamic stall at an altitude too low for recovery. Postaccident examination of the engine and airframe revealed no anomalies that would have precluded normal airplane operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper decision to perform a steep turn at low altitude, which resulted in exceedance of the airplane's critical angle of attack and an aerodynamic stall.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	Angle of attack - Capability exceeded
Aircraft	Lateral/bank control - Capability exceeded
Aircraft	Altitude - Not attained/maintained

Factual Information

History of Flight

Maneuvering-low-alt flying	Low altitude operation/event
Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Maneuvering-low-alt flying	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On January 21, 2017, at 1420 central standard time, a Bellanca 7GCBC, N91Z, descended and impacted terrain while maneuvering after takeoff from the Marian Airpark (F06), Wellington, Texas. The commercial pilot and the passenger were fatally injured, and the airplane was destroyed. The airplane was owned by Boedeker Flying Service, Inc., of Childress, Texas, and operated by the pilot under Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Visual meteorological conditions prevailed, and no flight plan was filed. The local flight was originating at the time of the accident.

The pilot's wife stated that her husband had taken his mother for a 15- to 20-minute flight before the accident flight. The purpose of the accident flight was to take his cousin flying. During takeoff, the airplane stayed in "ground effect for a little while" before it began climbing. The airplane "pitched hard over to the left," and it "looked like a stall." The pilot's wife stated that she was unable to hear engine noise because she was inside a car at the end of the runway during the accident flight.

A witness, who had been driving by the airport, stopped and took a series of photos of the airplane. The first photos taken by the witness show the airplane near or past the departure end of the runway at a height above the ground of about one wingspan of the airplane, initially in about a 20°-right-bank turn and then in a right climbing turn. The next photos show the airplane at an altitude of about 100 to 150 ft in a left turn with a bank angle that increased to about 80° to 90° before the airplane descended and impacted a wheat field south of the airport.

Pilot Information

Certificate:	Commercial	**Age:**	28,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	February 17, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 31, 2016
Flight Time:	(Estimated) 492 hours (Total, all aircraft), 111 hours (Total, this make and model), 453 hours (Pilot In Command, all aircraft), 56 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

According to the pilot's logbook, which had entries dated April 26, 2010, to January 2 to 4, 2017, the pilot had accumulated 2,000 hours of flight experience. The first logbook entry for a flight in the accident airplane was dated May 30, 2016, which was an instructional flight; this entry was followed by five consecutive entries for instructional flights in the accident airplane with the last dated August 27, 2016.

The pilot had no Federal Aviation Administration (FAA) record of previous accidents, incidents, or enforcement actions.

The president of Boedeker Flying Service, an aerial spraying and firefighting business, stated that the pilot was hired in February or March 2014 as a full-time employee to load airplanes and provide ground support. For fire support, the pilot would travel to provide ground support/relief. Locally, the pilot would also wash airplanes.

The president stated that he did not know the pilot to have "irresponsible habits" and did not know of "anything that was a warning sign."

The pilot had no Federal Aviation Administration record of previous accidents, incidents, or enforcement actions.

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N91Z
Model/Series:	7GCBC	**Aircraft Category:**	Airplane
Year of Manufacture:	1972	**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	359-72
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	April 11, 2016 Annual	**Certified Max Gross Wt.:**	1650 lbs
Time Since Last Inspection:	98 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1970 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	O-320-A2B
Registered Owner:	BOEDEKER FLYING SERVICE INC (Pending)	**Rated Power:**	150 Horsepower
Operator:	BOEDEKER FLYING SERVICE INC (Pending)	**Operating Certificate(s) Held:**	None

The airplane's registration to Boedeker Flying Service was listed as "pending" by the FAA in May 2016. The president stated that he had sent the aircraft registration application to the FAA "a good while" ago and that he did not understand why the airplane's registration had not been updated.

The president stated that he did not charge employees for the use of the airplane, and the airplane was purchased for the "recreational" use by company employees. The president said that the "secondary benefit" of the airplane's purchase was to allow those who aspired to become aerial applicator pilots to gain experience.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CDS,1954 ft msl	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	13:53 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Broken	**Visibility (RVR):**	
Wind Speed/Gusts:	16 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.35 inches Hg	**Temperature/Dew Point:**	17°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Wellington, TX (F06)	**Type of Flight Plan Filed:**	None
Destination:	Wellington, TX (F06)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Marian Airpark F06	**Runway Surface Type:**	Asphalt
Airport Elevation:	2009 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	1800 ft / 60 ft	**VFR Approach/Landing:**	

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:**	34.850147,-100.210319(est)

The accident site was located about 0.55 nautical mile and 205° from the airport at an elevation of about 1,956 ft mean sea level. The airplane was upright on a north heading with an area of ground scarring extending north about 10 ft from the airplane's nose. The ground scar contained plexiglass, landing gear, and the propeller. The engine, wings, and horizontal and vertical stabilizers were attached to the fuselage. The propeller was separated at the attachment bolts from the engine's crankshaft flange. The bolts had 45° granular fracture features consistent with torsional overstress. One of the two propeller

blades exhibited S-shaped bending and chordwise scratching consistent with torsional rotation. There was no evidence of soot or fire.

Both wing flaps and the cockpit flap control lever were in the 0° flap position. Flight control continuity from the control surfaces to both cockpit controls was confirmed.

The instrument panel exhibited impact damage. The magneto key switch was in the both position, the master switch was in the on position, the carburetor heat control was in the off position, and the primer was in the off position. The fuel selector was in the on position. The cockpit throttle control was near the full forward position, and the carburetor heat control was in the midrange position. The cockpit throttle and carburetor heat control quadrant was damaged by the impact. The cockpit mixture control was in the full forward position. The airspeed indicator indicated 0 knots. The altimeter indicated about 1,300 ft mean sea level and had a setting of about 29.35 inches of mercury. The tachometer gauge was broken out of the instrument panel, and the case covering was separated from impact forces. The gauge's needle position was about 1,500 rpm, and a witness mark consistent with the shape and color of the needle was on the tachometer gauges' face about 1,700 rpm. The tachometer's hour indication was 238.1 hours.

There was no data plate attached to the engine. The oil, fuel, and ignition system components were intact. The engine contained oil, and the engine oil suction screen did not contain metallic debris. The exhaust was unobstructed and did not contain oil residue.

The carburetor was attached to its mounting flange, and the carburetor sustained impact damage with a resulting crack. The throttle control was attached to the carburetor throttle control arm, and the mixture control cable was separated from the carburetor mixture control due to overstress. The throttle and mixture control cables exhibited impact pulling. The carburetor fuel inlet screen was unobstructed. The carburetor float chamber was removed, and the chamber contained a liquid consistent in color and odor with a mixture of 100 low lead aviation fuel and engine oil. The liquid was tested with water sensing paste, and there was no resultant indication for the presence of water. The brass colored metallic float was attached to its hinge, was not damaged, and did not contain fluid within the float. The float did not exhibit signatures of impingement. The float moved without impingement when manipulated by hand.

The top spark plugs were removed, and the engine was rotated through the engine flywheel. During rotation, air was expelled, drawn into, and compression felt from the top spark plug holes. Engine and valve train continuity to the engine accessory section were confirmed.

Both magnetos were removed and rotated by hand by their accessory drive shafts. Ignition timing was checked and was within the engine manufacturer's specifications. An electrical spark was obtained from each of the right ignition harness' spark plug leads during rotation. The left magneto impulse coupling functioned without any mechanical anomalies. An electrical spark was obtained from each of the left ignition harness' spark plug leads during rotation.

Medical and Pathological Information

South Plains Forensic Pathology, P.A., Lubbock, Texas performed and autopsy of the pilot. The autopsy

report stated the cause of death was blunt force injuries of the head."

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on samples from the pilot. Testing was negative for carbon monoxide, ethanol, and drugs.

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Robert Smith; Federal Aviation Administration; Lubbock FSDO; Lubbock, TX
Original Publish Date:	September 4, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94635