



Aviation Investigation Final Report

Location:	Lakeway, Texas	Accident Number:	CEN19FA099
Date & Time:	March 14, 2019, 13:40 Local	Registration:	N8620B
Aircraft:	Cessna 172	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and student pilot were conducting takeoffs and landings in the airport traffic pattern. A flight instructor and pilot on the ground reported that the accident airplane's engine was "cutting in and out" or "sputtering" following an aborted landing. Both witnesses reported that the airplane appeared to be maneuvering to return to the runway when the airplane entered a left turn, then descended in a steep, nose-down attitude consistent with an aerodynamic stall. The common traffic advisory frequency recording captured a transmission that indicated the flight instructor might attempt to return to the airport. The airplane impacted a tree and then a road sign in a mostly residential area.

A postaccident examination of the airframe and engine revealed no mechanical malfunctions that would have precluded normal operation. The propeller exhibited signs of rotation and propeller strike marks were found on the ground at the accident site. Although the witness reports indicated a possible loss of power, the reason for the partial loss of engine power could not be determined based on the postaccident examination. After the partial loss of engine power, the flight instructor attempted a turn at low altitude, during which he failed to maintain proper airspeed and exceeded the airplane's critical angle of attack, which resulted in an aerodynamic stall and a loss of control at an altitude too low for recovery.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A partial loss of engine power for reasons that could not be determined, and the flight instructor's exceedance of the airplane's critical angle of attack while maneuvering for a forced landing, which resulted in an aerodynamic stall and subsequent loss of control.

Findings

Personnel issues	Aircraft control - Instructor/check pilot
Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Capability exceeded
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

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

On March 14, 2019, about 1340 central daylight time, a Cessna 172, N8620B, sustained substantial damage when it was involved in an accident near Lakeway, Texas. The flight instructor sustained serious injuries and the student pilot sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The purpose of the flight was for the student to practice crosswind takeoffs and landings. The flight instructor was unable to recall the events leading up to the accident.

Another flight instructor saw the accident airplane abort two landings, which he surmised was due to the gusting wind conditions. As the airplane flew upwind after the second aborted landing, he heard the engine begin to sputter. The airplane then turned back toward the airport, flew over his location at the airport fuel pump, then turned right away from the runway before entering a left turn toward the runway from about 500 to 600 ft above ground level. He stated that from his view on the ground, it appeared that the flight instructor was flying the airplane at that point. The airplane stalled and descended straight toward the ground, "wing and nose" first.

A pilot, who was receiving instruction with the eyewitness flight instructor, reported that he saw the airplane turn back toward the runway after conducting a go-around. The airplane proceeded over the runway and he heard the engine "sputtering." He saw a puff of "darker exhaust" come out of the engine and heard the engine restarting. The airplane maneuvered toward a left downwind leg for the runway, then "appeared to abruptly stall and roll to its left in a nose-down attitude."

A pilot who lived near the northwest end of the airport reported that the airplane got his attention as the sound from the engine was "unusual." He saw the airplane's flaps extended and stated that the engine noises were not the sound of an engine making any appreciable power.

The common traffic advisory frequency recording for the airport just before the time of the accident, recorded a transmission stating, "Lakeway traffic, Skyhawk making a 180 to land Lakeway."

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	38,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine	Toxicology Performed:	Yes
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	October 3, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 10, 2017
Flight Time:	1472 hours (Total, all aircraft), 462 hours (Total, this make and model), 855 hours (Pilot In Command, all aircraft), 115 hours (Last 90 days, all aircraft), 41 hours (Last 30 days, all aircraft)		

Student pilot Information

Certificate:	Student	Age:	36,Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Lap only
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	None	Last FAA Medical Exam:	February 12, 2019
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 15.3 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N8620B
Model/Series:	172 Undesignat	Aircraft Category:	Airplane
Year of Manufacture:	1958	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	36320
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	November 7, 2018 100 hour	Certified Max Gross Wt.:	2200 lbs
Time Since Last Inspection:	99 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	4976.7 Hrs as of last inspection	Engine Manufacturer:	Continental Motors
ELT:	C91 installed, activated, did not aid in locating accident	Engine Model/Series:	O-300-D
Registered Owner:		Rated Power:	145 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The Cessna 172 Pilot's Operating Handbook states that the aerodynamic stall speed for flaps down (40°) is 52 kts at a 0° bank angle, 54 kts at a 20° bank angle, 59 kts at a 40° bank angle, and 73 kts at a 60° bank angle.

The airplane was equipped with a stall warning indicator.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KRYW, 1231 ft msl	Distance from Accident Site:	9 Nautical Miles
Observation Time:	18:35 Local	Direction from Accident Site:	9°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	12 knots / 20 knots	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	340°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.04 inches Hg	Temperature/Dew Point:	22°C / -14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lakeway, TX (3R9)	Type of Flight Plan Filed:	None
Destination:	Lakeway, TX (3R9)	Type of Clearance:	None
Departure Time:	13:40 Local	Type of Airspace:	Class G

Airport Information

Airport:	Lakeway Airpark 3R9	Runway Surface Type:	Asphalt
Airport Elevation:	909 ft msl	Runway Surface Condition:	Dry
Runway Used:	34	IFR Approach:	None
Runway Length/Width:	3930 ft / 70 ft	VFR Approach/Landing:	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 1 Serious	Latitude, Longitude:	30.351388,-97.993888(est)

The wreckage was located about 930 ft southwest of the runway 34 threshold at an elevation of about 915 ft mean sea level (msl) in a mostly residential area. The airplane initially impacted a tree and road sign on a heading of about 59°, and various propeller strike marks on the asphalt were observed in the direction of travel. The airplane traveled about 180 ft to the northeast across a road before it came to rest on a heading of about 182°.

The airplane sustained substantial damage to the fuselage, both wings, and the empennage. The airframe was found in a tail-high attitude off a road in an area of grass. The front of the airplane, including the engine and propeller, came to rest in a tree line. Witness marks on the airframe indicated that the wing flaps were fully extended (40°) at the time of impact. All structural components of the airplane were located at the accident site. Flight control continuity was established throughout the airframe.

Engine control cable continuity was confirmed. The carburetor was found separated in two pieces. The two-blade metal propeller was found attached to the crankshaft. The propeller spinner exhibited evidence of rotation. Both blades were bent aft and one blade was severely twisted.

The engine was transported to the manufacturer's facility for a teardown and examination under the supervision of the NTSB investigator-in-charge. During the examination, no preimpact mechanical malfunctions or failures with the engine were noted.

Review of the airplane's maintenance records revealed no evidence of uncorrected mechanical discrepancies with the airframe and engine.

Medical and Pathological Information

The Travis County Medical Examiner's Office, Austin, Texas, conducted an autopsy of the student pilot.

His cause of the death was multiple blunt force injuries.

Toxicology testing for the student pilot was performed at the FAA Forensic Sciences Laboratory and was negative for carbon monoxide, ethanol, and tested-for drugs.

Preventing Similar Accidents

Prevent Aerodynamic Stalls at Low Altitude

While maneuvering an airplane at low altitude in visual meteorological conditions, many pilots fail to avoid conditions that lead to an aerodynamic stall, recognize the warning signs of a stall onset, and apply appropriate recovery techniques. Many stall accidents result when a pilot is momentarily distracted from the primary task of flying, such as while maneuvering in the airport traffic pattern, during an emergency, or when fixating on ground objects.

An aerodynamic stall can happen at any airspeed, at any altitude, and with any engine power setting. Pilots need to be honest with themselves about their knowledge of stalls and preparedness to recognize and handle a stall situation. Training can help pilots fully understand the stall phenomenon, including angle-of-attack concepts and how weight, center of gravity, turbulence, maneuvering loads and other factors can affect an airplane's stall characteristics. The stall characteristics may be different in each type of plane, so learn them before you fly.

The stall airspeeds marked on the airspeed indicator (for example, the bottom of the green arc and the bottom of the white arc) typically represent steady flight speeds at 1G at the airplane's maximum gross weight in the specified configuration. Maneuvering loads and other factors can increase the airspeed at which the airplane will stall. For example, increasing bank angle can increase stall speed exponentially.

Reducing angle of attack by lowering the airplane's nose at the first indication of a stall is the most important immediate response for stall avoidance and stall recovery. This may seem counterintuitive at low altitudes, but is a necessary first step.

See http://www.nts.gov/safety/safety-alerts/documents/SA_019.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):	Hodges, Michael		
Additional Participating Persons:	Michael Smith; FAA San Antonio FSDO; San Antonio , TX Peter Basile; Textron Aviation ; Wichita, KS Michael Council; Continental Motors ; Mobile, AL		
Original Publish Date:	December 3, 2020	Investigation Class:	2
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99112		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).