Aviation Investigation Final Report

Location:	Shreveport, Louisiana	**Accident Number:**	CEN18LA346
Date & Time:	August 22, 2018, 10:50 Local	**Registration:**	N4275Q
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Miscellaneous/other	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The student pilot was departing on a solo cross-country flight when she observed a decrease in climb performance and airspeed shortly after takeoff. She reduced airplane pitch to increase airspeed and avoid an aerodynamic stall. Although the engine continued to operate normally at full throttle, the pilot concluded that there was an engine issue because she was unable to maintain a normal climb pitch attitude without a decrease in airspeed. She told the tower controller that she was going to land and made an immediate turn near midfield to land on a crossing runway. She stated that, after aligning with the crossing runway, the airplane's airspeed had increased to 95-100 knots and that the airplane was too high to make a normal landing. She reduced engine power to idle and attempted to glide to the runway; however, the airplane landed in a grassy area past the end of the runway and bounced three times before the nose gear collapsed.

The pilot acknowledged after the accident that the engine did not malfunction during the flight and postulated that the airplane had encountered a wingtip vortex from another airplane. However, a review of available air traffic control radar track data did not identify any departing or landing aircraft during the 15 minutes before the accident that would have resulted in a wake turbulence encounter. Additionally, the postaccident examination of the airplane's flight controls and engine did not reveal any evidence of a mechanical malfunction or failure that would have precluded normal operation. Based on the pilot's statement and the lack of any evidence of a mechanical malfunction or failure, it is likely that she overshot the runway after her misperception of an engine issue due to her failure to maintain proper pitch control during initial climb.

Probable Cause and Findings

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

The student pilot's overshoot of the runway, which resulted from her misperception of an engine issue due to her failure to maintain proper pitch control during initial climb.

Findings

Aircraft	Pitch control - Not attained/maintained
Personnel issues	Perception - Pilot

Factual Information

History of Flight

Initial climb	Miscellaneous/other (Defining event)
Landing	Landing area overshoot
Landing	Hard landing
Landing	Landing gear collapse
Landing	Collision with terr/obj (non-CFIT)

On August 22, 2018, about 1050 central daylight time, a Cessna 172L, N4275Q, made a precautionary landing shortly after takeoff from Shreveport Regional Airport (SHV), Shreveport, Louisiana. The student pilot sustained minor injuries, and the airplane was substantially damaged. The airplane was registered to and operated by a private individual under the provisions of Title 14 *Code of Federal Regulations* (*CFR*) Part 91. Day visual meteorological conditions prevailed at the accident site. The intended solo cross-country flight to Texarkana Regional Airport-Webb Field (TXK), Texarkana, Arkansas, was departing at the time of the accident.

The student pilot reported that she arrived at SHV around 0930 to preflight the airplane. She stated that her preflight inspection was routine and that she did not observe any anomalies besides low tire pressure on both main landing gear. The engine had about 7 quarts of oil and both fuel tanks were full (topped-off) before the flight. She obtained a taxi clearance from her hangar to an aircraft maintenance facility on the airport that her father owned. After repositioning the airplane to the maintenance facility, she and her father inflated both main tires and polished the windscreen. The pilot reported that the engine restarted without hesitation and ran normally before she taxied to the runway. She obtained a taxi clearance to runway 24 and requested visual flight rules flight following to TXK from ground control. The pilot stated that the surface wind was from 100° magnetic at 4 knots, according to the automatic terminal information service broadcast. She reported the before-takeoff engine runup was uneventful; increased engine speed to 1,700 rpm, verified both magnetos were functional, applied carburetor heat and observed a corresponding decrease of engine speed, and observed normal engine oil temperature and pressure indications. She then verified that the flight controls moved freely through their entire range-of-movements, the elevator trim was set for takeoff (slightly nose-up), and verified correct radio frequencies before calling the tower controller for a takeoff clearance. The tower controller told her to hold short of the runway; however, she received a takeoff clearance about 30 seconds later.

The pilot reported that the takeoff run was normal and that she rotated for liftoff at 60 knots. She stated that after liftoff the elevator force feedback through the control wheel and the kinetic forces were less than normal. The pilot established a normal climb pitch attitude and the airplane climbed to about 800 ft mean sea level where she perceived a continued degradation of airplane climb performance and observed the airspeed decrease from 75 knots to 70 knots. She recalled that the airplane would not climb without a loss of airspeed. The pilot reduced airplane pitch to increase airspeed and avoid an aerodynamic stall. The throttle remained at full power and the engine continued to run smoothly. The pilot stated that despite not observing any anomalies with engine operation, she concluded that the

airplane was having engine issues because she was unable to maintain a normal climb pitch attitude without a loss of airspeed. She told the tower controller that she was having engine issues and that she was going to land. The tower controller cleared her to land on any runway. She made an immediate left turn near midfield to land on runway 14. The pilot stated that after aligning with runway 14 the airplane's airspeed had increased to 95-100 knots and that the airplane was too high to make a normal landing. She reduced engine power to idle and attempted to glide to the runway. The pilot reported that the airplane was not able to land on the remaining runway and that she made a slight left turn to land in the grass area southeast of the runway. The airplane bounced three times in the grass before the nose gear collapsed. The airplane then impacted a drainage ditch at the airport perimeter. The pilot reported that she was not wearing the available shoulder harness, and consequently she was briefly knocked unconscious when her forehead impacted the glare shield and her chin impacted the instrument panel.

The pilot acknowledged that the engine did not malfunction during the flight and postulated that the airplane had encountered a wingtip vortex from another airplane. The pilot further acknowledged that she likely did not have enough experience to correctly identify and recover from a wake turbulence encounter. The pilot stated that she began flight training on June 15, 2018, and all flights were completed in a Cessna 172 airplane. The pilot had flown 63 hours total, of which 9 hours were solo.

A postaccident review of available air traffic control radar track data did not identify any departing or landing aircraft during the 15 minutes before the accident that would have resulted in a wake turbulence encounter.

The airplane was examined by a Federal Aviation Administration (FAA) inspector with the Baton Rouge Flight Standards District Office. The FAA inspector reported that the airplane had landed in the grass to the southeast of runway 14. The landing rollout measured 553 ft long before the airplane impacted a drainage ditch and embankment. The nose landing gear had collapsed, and the airplane came to rest on the lower engine cowl. The cabin floor boards were buckled. The ignition switch and fuel selector were repositioned to OFF by the fire department. The positive battery terminal was disconnected from the battery by the fire department. The FAA inspector confirmed flight control cable continuity from the cockpit controls to each flight control surface. Engine control continuity was confirmed from the cockpit controls to their respective engine controls. There was sufficient fuel observed in each wing fuel tank and neither tank appeared damaged. Fuel samples obtained from both wing tanks, the fuel strainer assembly, and the fuel line to the carburetor were blue in color and had an odor consistent with 100 low-lead aviation fuel. There was no water or particulate contamination observed in any of the fuel samples.

The engine remained partially attached to the firewall. Several engine mounts were bent or fractured. The propeller remained attached to the propeller flange. One propeller blade was bent aft about 90° and the other blade appeared undamaged. There were no anomalies observed with the engine crankcase or its exterior-mounted components. The sparkplugs were removed and exhibited features consistent with normal engine operation. Internal engine and valve train continuity were confirmed as the engine crankshaft was rotated. Compression and suction were noted on all cylinders in conjunction with crankshaft rotation, and acceptable cylinder pressures were measured using a differential pressure gauge. The left magneto remained attached to its installation point and provided spark on all posts while the crankshaft was rotated. The right magneto remained attached to its installation point and was not equipped with an impulse coupling. The engine had about 6 quarts of oil when measured with its calibrated dipstick. The oil cooler was impact damaged and leaking oil. The carburetor fuel inlet screen

was free of contamination. The carburetor bowl contained fuel and no contamination was observed in the carburetor bowl. Disassembly of the carburetor did not reveal any anomalies with the venturi, metal floats, accelerator pump, or needle valve. The postaccident examination did not reveal any evidence of a mechanical malfunction that would have precluded normal engine operation during the flight.

A review of available meteorological data established that day visual meteorological conditions prevailed at the accident site. At 1056, about 6 minutes after the accident, the SHV automated surface observing system reported: wind direction variable at 3 knots, 10 miles surface visibility, few clouds at 4,500 ft above ground level (agl), scattered clouds at 28,000 ft agl, temperature 29°C, dew point 18°C, and an altimeter setting 30.17 inches of mercury.

Student pilot Information

Certificate:	Student	**Age:**	25,Female
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	July 10, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 9, 2018
Flight Time:	63 hours (Total, all aircraft), 63 hours (Total, this make and model), 9 hours (Pilot In Command, all aircraft), 63 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4275Q
Model/Series:	172 L	**Aircraft Category:**	Airplane
Year of Manufacture:	1971	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17260175
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 1, 2018 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	47 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3190 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-320-E2D
Registered Owner:		**Rated Power:**	150 Horsepower
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:	SHV,258 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	10:56 Local	**Direction from Accident Site:**	303°
Lowest Cloud Condition:	Few / 4500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.17 inches Hg	**Temperature/Dew Point:**	29°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Shreveport, LA (SHV)	**Type of Flight Plan Filed:**	VFR
Destination:	Texarkana, AR (TXK)	**Type of Clearance:**	VFR flight following
Departure Time:	10:50 Local	**Type of Airspace:**	Class C

Airport Information

Airport:	Shreveport Regional SHV	**Runway Surface Type:**	
Airport Elevation:	258 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	32.438888,-93.814163

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Paul A Marks; Federal Aviation Administration, Baton Rouge FSDO; Baton Rouge, LA
Original Publish Date:	September 27, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98132