Aviation Investigation Final Report

Location:	Hereford, Texas	**Accident Number:**	CEN18LA378
Date & Time:	September 9, 2018, 11:17 Local	**Registration:**	N4078W
Aircraft:	Piper PA32	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	4 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot lost control of the airplane during takeoff; it subsequently impacted the ground near the departure end of the runway and was destroyed. The pilot reported that she had no memory of her preflight activity or takeoff. A witness observed the airplane in a nose-high, tail-low attitude during the takeoff but lost sight of the airplane behind hangars. He noted that the engine sounded like it was at full power. Postaccident examination of the airplane did not reveal any evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation. Data recovered from an onboard engine monitor did not reveal any indication of a loss of engine power during takeoff. The airplane was loaded within the gross weight and center-of-gravity limits. Performance data indicated that the available runway length was sufficient for takeoff. It is likely that the pilot overrotated during takeoff and the airplane entered an aerodynamic stall, which resulted in the airplane departing controlled flight and impacting the ground.

Probable Cause and Findings

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

The pilot's exceedance of the airplane's critical angle of attack during takeoff, which resulted in an aerodynamic stall.

Findings

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

Factual Information

History of Flight

Takeoff	Loss of control in flight (Defining event)
Takeoff	Aerodynamic stall/spin
Takeoff	Collision with terr/obj (non-CFIT)

On September 9, 2018, at 1117 central daylight time, a Piper PA-32-300 airplane, N4078W, impacted terrain after takeoff from runway 20 at the Hereford Municipal Airport (HRX), Hereford, Texas. The pilot and three passengers were seriously injured and the airplane was destroyed. The airplane was registered to and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed for the personal flight that was not being operated on a flight plan. The flight was originating at the time of the accident and was destined for the Reagan County Airport (E41), Big Lake, Texas.

The pilot reported that she had no memory of any portion of the accident flight, including her arrival at the airport that morning and the pre-flight activity.

A witness reported that he was in a T-hangar on the airport when he observed a portion of the takeoff. He stated that the airplane was in a nose high, tail low attitude before he lost sight of it behind a line of hangars. The engine sounded like it was operating at full power.

The airplane came to rest in a grass field about 350 yards southeast of the departure end of the runway. The main wreckage consisted of the fuselage, engine/propeller, right wing and empennage. The fuselage came to rest on its right side. The right wing had separated at the root and was located immediately adjacent to the fuselage. The left wing was separated at the root and was located about 50 yards north of the main wreckage.

A postrecovery examination of the airplane did not reveal any anomalies consistent with a preimpact failure or malfunction. The airplane was equipped with an engine monitor which was downloaded. The data did not reveal any indication of a loss of engine power during takeoff. The data indicated that the takeoff began about 1116:40 as the engine speed increased to 2,659 rpm. The engine speed remained at or above 2,643 rpm until the penultimate data point, which was recorded at 1117:34. The final data point was recorded at 1117:40; the corresponding engine speed at that time was 2,209 rpm. The rated engine speed was 2,700 rpm. The remaining engine parameters were within normal operating limits during the engine run-up and takeoff.

A weight and balance calculation based on the available loading information revealed that the takeoff gross weight was approximately 3,249 lbs. and the center-of-gravity location was about 92.59 inches. This was within the allowable loading envelope for the airplane. A current airplane weight and balance record was not available to the investigation. The calculation used a previous airplane empty weight noted in the Federal Aviation Administration airworthiness records.

Performance information contained in the airplane owner's manual indicated that the expected takeoff ground roll with 10° flaps was about 1,800 ft and about 2,900 ft required to clear a 50 ft obstacle. With 25° flaps, the takeoff ground roll was expected to be about 1,700 ft and about 2,700 ft required to clear a 50 ft obstacle. The density altitude at the time of the accident was about 5,647 ft. The available runway length was 6,100 ft.

The airplane owner's manual stated that during takeoff the airplane should be allowed to accelerate to 65 to 70 mph. The manual noted, "premature raising of the nose, or raising it to an excessive angle will result in a delayed take-off." The manual recommended a normal takeoff flap setting of 10° (first notch), and a short-field takeoff flap setting of 25° (second notch).

Pilot Information

Certificate:	Private	**Age:**	30,Female
Airplane Rating(s):	Single-engine land	**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 With waivers/limitations	**Last FAA Medical Exam:**	September 26, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 12, 2017
Flight Time:	272 hours (Total, all aircraft), 44 hours (Total, this make and model), 213 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4078W
Model/Series:	PA32 300	**Aircraft Category:**	Airplane
Year of Manufacture:	1966	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32-40121
Landing Gear Type:	Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 11, 2018 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	21 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	6953 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-540-K1A5
Registered Owner:		**Rated Power:**	300 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:	HRX,3788 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	11:15 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Scattered / 2100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 3000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	23°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hereford, TX (HRX)	**Type of Flight Plan Filed:**	None
Destination:	Big Lake, TX (E41)	**Type of Clearance:**	None
Departure Time:	11:16 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Hereford Muni HRX	**Runway Surface Type:**	Concrete
Airport Elevation:	3788 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	20	**IFR Approach:**	None
Runway Length/Width:	6100 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Serious	**Latitude, Longitude:**	34.856388,-102.325836

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Robert A Smith; FAA – Flight Standards; Lubbock, TX
Original Publish Date:	November 19, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98272