Aviation Investigation Final Report

Location:	Dickinson, North Dakota	**Accident Number:**	CEN18LA039
Date & Time:	November 22, 2017, 12:53 Local	**Registration:**	N4040M
Aircraft:	Piper PA 12	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was attempting a takeoff from an industrial truck yard in 24- to 31-knot gusting headwind conditions. He performed a short field takeoff procedure with the wing flaps extended about halfway. As the airplane reached about 30 knots, the airplane's tailwheel lifted off the ground, then the pilot fully extended the flaps and the airplane became airborne. Shortly afterward, the right wing dropped. As he was recovering from the right bank, the pilot retracted the flaps from fully extended back to half extension and confirmed that the throttle was full forward. At that time, the airplane turned sharply to the right and descended into a parked trailer.

A witness reported that, shortly after becoming airborne, the airplane entered a 35° right bank. The pilot corrected slightly; however, at that point, the airplane started a more abrupt climb, "snap rolled" to the right, and impacted the trailer inverted. The bank and roll to the right are consistent with an aerodynamic stall.

A postaccident examination did not reveal any anomalies consistent with a preimpact failure or malfunction. The exact position of the wing flaps at the time of impact could not be determined.

The dirt- and gravel-surfaced takeoff area was about 750 ft long and was rough and uneven. The uneven takeoff area may have reduced the airplane's acceleration during the takeoff ground roll, and the gusty wind condition may have contributed to the stall once airborne. In addition, given the limited takeoff distance available, the pilot may have rotated the airplane at a slower-than-normal airspeed, thereby increasing the possibility of an inadvertent stall. Additionally, the extension and retraction of the wing flaps during takeoff resulted in abrupt changes in the airplane's angle of attack and a subsequent aerodynamic stall, which precipitated the pilot's loss of control.

Probable Cause and Findings

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

The pilot's failure to attain adequate airspeed during the short field takeoff, which resulted in an exceedance of the airplane's critical angle of attack and an aerodynamic stall.

Findings

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

Factual Information

History of Flight

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

On November 22, 2017, at 1253 mountain standard time, a Piper PA-12 airplane, N4040M, was substantially damaged during an in-flight collision with a truck trailer immediately after takeoff from an industrial truck yard near Dickinson, North Dakota. The pilot sustained serious injuries and the passenger sustained minor injuries. The airplane was registered to and operated by the pilot as a 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed. The flight was not operated on a flight plan. The flight was originating at the time of the accident. The intended destination was the Sloulin Field International Airport (ISN), Williston, North Dakota.

The pilot stated that during the accident takeoff, when the airplane attempted to climb out of ground effect, it banked to the right and the right-wing tip contacted the ground. The airplane continued to roll and came to rest on a truck trailer. He commented that the airplane might have encountered a wind gust which contributed to a right wing stall. He did not perceive anomalies with respect to the airplane during the accident takeoff.

The pilot informed Federal Aviation Administration (FAA) inspectors that he did not feel that there was any hindrance to the airplane during the accident takeoff. The airplane was positioned at the east end of the truck yard to use all the available takeoff area. He set two notches of flaps and executed a short field takeoff procedure. The tail of the airplane lifted off the ground at about 30 knots, at which time he applied full flaps causing the airplane became airborne. Shortly afterward, the right wing dropped possibly due to a gust of wind. He responded by applying full left aileron and full left rudder to compensate. As he was recovering from the right bank, he retracted the flaps from full (third notch) to one-half (second notch) and confirmed throttle was full forward. At that time, the airplane tucked and turned sharply to the right.

According to the passenger, the airplane was gaining speed during the takeoff run until it neared the west end of the maintenance building located in the yard. About 10 or 15 feet above the ground, the airplane seemed to come to a "complete dead stop" and subsequently rolled to the right. The pilot was able to recover momentarily; however, the airplane banked to the right again and ultimately impacted a truck trailer.

A witness reported that the airplane became airborne about 400 feet into the takeoff run. Shortly afterward, when the airplane was about 6 feet above ground level, the right wing dipped to 35 or 40 degrees of bank. The pilot corrected, but the airplane remained in a 20-degree right bank. At that point, the airplane started a more abrupt climb, at which time the airplane "snap rolled" to the right and impacted a truck trailer inverted. He described the airplane attitude as "significantly nose up" and estimated the pitch angle as about 15-degrees angle of attack. The right-wing tip was about 6 feet off the

ground when the airplane started the roll. The witness noted that the engine sounded as it if came to full power at the beginning of the takeoff and did not vary. He did not perceive and issues with respect to the engine.

One of the FAA inspectors that responded to the accident site reported that the truck yard consisted of dirt and gravel. The portion of the yard used for the accident takeoff was rough and uneven. The takeoff distance available was about 750 feet. A postaccident examination did not reveal any anomalies consistent with a preimpact failure or malfunction. Flight control continuity was confirmed, which included the wing flap control system. The cockpit flap handle appeared to be in the retracted (up) position at the time of the examination. The flaps were also in the retracted position; however, the exact position of the wing flaps at the time of impact could not be determined.

Pilot Information

Certificate:	Private	**Age:**	33,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
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:**	October 1, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 14, 2015
Flight Time:	185 hours (Total, all aircraft), 78 hours (Total, this make and model), 103 hours (Pilot In Command, all aircraft), 35 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4040M
Model/Series:	PA 12 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	1947	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	12-2923
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	February 10, 2017 Annual	**Certified Max Gross Wt.:**	1750 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2168 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-A2B
Registered Owner:	On file	**Rated Power:**	1500 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:	DIK,2592 ft msl	**Distance from Accident Site:**	13 Nautical Miles
Observation Time:	12:56 Local	**Direction from Accident Site:**	179°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	24 knots / 31 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.85 inches Hg	**Temperature/Dew Point:**	17°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Dickinson, ND (N/A)	**Type of Flight Plan Filed:**	None
Destination:	Williston, ND (ISN)	**Type of Clearance:**	None
Departure Time:	12:53 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	47.021389,-102.810279(est)

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Joanna Spiekermeier; FAA Flight Standards; Fargo, ND
Original Publish Date:	July 5, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=96371