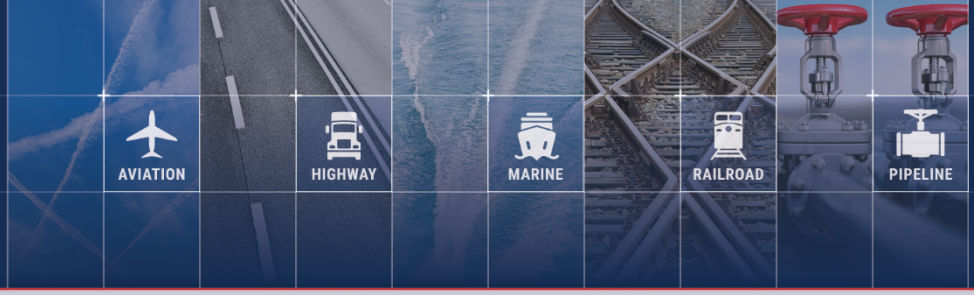

Aviation Investigation Final Report

Location:	Geneseo, New York	**Accident Number:**	ERA18LA191
Date & Time:	July 13, 2018, 18:00 Local	**Registration:**	N291CP
Aircraft:	Cessna 182	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Serious, 2 Minor
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The commercial pilot reported that, before the accident flight, he repositioned the airplane uneventfully from an airport about 20 miles away. Before takeoff on the accident flight, the pilot performed an engine run-up and verified that all flight controls were free and correct. The pilot then initiated a soft-field takeoff procedure on a bumpy, grass runway. The airplane became airborne in ground effect about 45 knots, and it then began to climb out of ground effect at 60 knots. At that time, the airplane's nose pitched up abruptly, and the pilot pushed the yoke forward as hard as he could while engaging nose-down electric elevator trim; however, the airplane continued to climb at an excessive angle of attack and subsequently stalled. The airplane then rolled left, descended to the ground, and came to rest inverted. Neither passenger could recall whether the pilot conducted any type of control check or engine run-up before takeoff.

Examination of the wreckage did not reveal evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. The elevator trim tab was found in a midrange, nose-down position, consistent with the pilot's statement that he was trimming nose down in an attempt to recover from the loss of control on takeoff. The Before Takeoff – Run-Up checklist stated that the elevator should be trimmed to 20° nose down for takeoff. Given the airplane pitched up abruptly as it began to climb out of ground effect, it is likely that the pilot landed after the previous flight with a nose-up elevator trim setting and that he did not properly reset the elevator trim before takeoff for the accident flight in accordance with the Before Takeoff—Run-Up checklist, which resulted in an exceedance of the airplane's critical angle of attack during takeoff and the subsequent aerodynamic stall.

Probable Cause and Findings

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

The pilot's failure to properly set the elevator trim before takeoff, which resulted in an exceedance of the airplane's critical angle of attack during takeoff and a subsequent aerodynamic stall. Contributing to the accident was the pilot’s failure to follow the Before Takeoff—Run Up checklist.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Use of checklist - Pilot
Aircraft	Elevator tab control system - Incorrect use/operation

Factual Information

History of Flight

Takeoff	Abrupt maneuver
Takeoff	Attempted remediation/recovery
Takeoff	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)
After landing	Roll over

On July 13, 2018, about 1800 eastern daylight time, a Cessna 182T, N291CP, was substantially damaged during takeoff from Geneseo Airport (D52), Geneseo, New York. The commercial pilot sustained serious injuries and the two passengers sustained minor injuries. The airplane was operated by the Civil Air Patrol (CAP) as a familiarization flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight.

The pilot reported that earlier during the day of the accident, he completed a flight from Greater Rochester International Airport (ROC), Rochester, New York, to D52 uneventfully and did not use the autopilot during that flight or the accident flight. The purpose of the accident flight was to provide a familiarization flight to two CAP cadets. The pilot showed the cadets a thorough preflight inspection and then started the engine and taxied to runway 23. Prior to takeoff, the pilot performed an engine run-up and verified that all flight controls were free and correct. The pilot then initiated a soft-field takeoff procedure on the bumpy grass runway. The airplane became airborne in ground effect about 45 knots and everything seemed normal as it began to climb out of ground effect at 60 knots. At that time, the nose pitched up abruptly and the pilot pushed the yoke forward as hard as he could while engaging nose-down electric elevator trim; however, the airplane continued to climb at an excessive angle-of-attack and stalled. It subsequently rolled left, descended to the ground and came to rest inverted.

Both passengers were minors and interviewed separately by a Federal Aviation Administration (FAA) inspector in the presence of a parent. One passenger did not recall the pilot doing a preflight inspection, use a checklist, or perform any type of check and engine run-up prior to takeoff. The other passenger recalled an abbreviated preflight inspection and use of a checklist before and after engine start; however, he did not recall any stopping prior to entering the runway, engine run-up, or control check except for flaps moving. Both passengers sustained concussions in the accident.

Initial examination of the wreckage by an FAA inspector revealed damage to both wings and the fuselage. The inspector measured the elevator trim actuator arm, which corresponded to a 10° tab-up (nose-down) trim position. The maximum tab-up position was 24°, plus or minus 2°. The inspector also recovered a memory card from the airplane's multifunction display; however, download and review of the data revealed that the last recorded flight was in 2016. The wreckage was subsequently up-righted and recovered by the operator.

The FAA inspector examined the wreckage again with a representative from the airframe manufacturer. All control surfaces were moveable by hand. All flight control cables were intact and attached to their respective flight and cockpit controls except left aileron cable, which had separated between the front door post and instrument panel, in the area of the fuselage separation. The separated ends of the left aileron cable exhibited a broom-straw appearance. The rudder and elevator cables and their routing area were visually examined throughout the length of the airplane. The elevator and elevator trim autopilot servos could be moved by hand. No preimpact impediments to the movement of the control yokes were observed between the firewall and instrument panel and no preimpact abnormalities were observed during the examination.

Review of the operator's "Before Takeoff – Run-Up" checklist revealed, "…20. Elevator & Rudder Trim…Take Off…"

The recorded weather at ROC, at 1754, included wind from 220° at 7 knots, visibility 10 miles and scattered clouds at 14,000 feet.

Pilot Information

Certificate:	Commercial	**Age:**	65,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	December 6, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 6, 2017
Flight Time:	991 hours (Total, all aircraft), 112 hours (Total, this make and model), 960 hours (Pilot In Command, all aircraft), 24 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N291CP
Model/Series:	182 T	**Aircraft Category:**	Airplane
Year of Manufacture:	2007	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18281991
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 17, 2017 Annual	**Certified Max Gross Wt.:**	2348 lbs
Time Since Last Inspection:	83 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2057 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-540-AB1A5
Registered Owner:		**Rated Power:**	230 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ROC,59 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	17:54 Local	**Direction from Accident Site:**	30°
Lowest Cloud Condition:	Scattered / 14000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 18000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	31°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Geneseo, NY (D52)	**Type of Flight Plan Filed:**	None
Destination:	Geneseo, NY (D52)	**Type of Clearance:**	None
Departure Time:	18:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Geneseo Airport D52	**Runway Surface Type:**	Grass/turf
Airport Elevation:	560 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	23	**IFR Approach:**	None
Runway Length/Width:	4695 ft / 90 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 2 Minor	**Latitude, Longitude:**	42.79861,-77.842498(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Robert Cunningham; FAA/FSDO; Rochester, NY Henry Soderlund; Textron; Wichita, KS George Vogt; Civil Air Patrol; Montgomery, AL
Original Publish Date:	April 30, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97768