# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Mooresville, North Carolina | **Accident Number:** | ERA17LA141 |
| **Date & Time:** | March 29, 2017, 13:25 Local | **Registration:** | N2383C |
| **Aircraft:** | Cessna R182 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Miscellaneous/other | **Injuries:** | 2 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

After an uneventful preflight inspection and engine runup, the private pilot attempted to take off from a 1,700-ft-long turf runway for the personal flight. During the takeoff roll, as the airplane reached a point on the runway where it would normally lift off (about 1,200 ft down the runway), the pilot pulled back on the yoke, but the airplane did not climb. The pilot recalled that the airspeed was close to 60 knots; he did not recall any engine instrument indications and noted that the engine sounded normal. When he realized that the airplane was not going to take off and a collision appeared imminent, he advised his passenger to prepare for impact. As the airplane approached a fence just beyond the departure end of the runway, he pulled back on the yoke and the airplane lifted off, flew over the fence, then descended and struck another fence before coming to rest in the driveway of his residence.

Examination of the airframe and engine did not reveal any evidence of preimpact mechanical malfunctions or anomalies that would have precluded normal operation. Given this and the pilot's description that the engine appeared to be operating normally during the takeoff, it is unlikely that a partial loss of engine power contributed to the accident.
Review of takeoff performance data in the pilot operating handbook for the airplane make and model revealed that, given the airplane's weight and approximate weather conditions around the time of the accident, the airplane should have been able to become airborne with the runway available; however, the data assumed the flaps were set to 20° extension. Although the pilot believed the flaps were "down" when he started the takeoff roll, he noticed that they were "up" after the accident, which suggests that he may not have actually set them to 20° before initiating the takeoff. This fully retracted flap setting may have reduced the airplane's takeoff performance and resulted in a longer ground roll than expected.

## 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 configure the airplane's flaps for takeoff, which resulted in a longer ground roll and subsequent runway excursion.

## Findings

| | |
|---|---|
| **Personnel issues** | Forgotten action/omission - Pilot |
| **Aircraft** | Trailing edge flaps - Incorrect use/operation |
| **Environmental issues** | Fence/fence post - Contributed to outcome |

# Factual Information

## History of Flight

| | |
|---|---|
| **Takeoff** | Miscellaneous/other (Defining event) |
| **Takeoff** | Runway excursion |
| **Emergency descent** | Collision with terr/obj (non-CFIT) |

On March 29, 2017, about 1325 eastern daylight time, a privately owned and operated Cessna R182, N2383C, was substantially damaged when it impacted a fence while attempting to depart from Atwell Airport (1NC2), Mooresville, North Carolina. The private pilot and passenger were not injured. The flight was destined for Riley Creek Airport (12TN), Kingston, Tennessee. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight, which was conducted under the provisions of 14 *Code of Federal Regulations* Part 91.

According to the pilot, the airplane was last flown in November 2016. On the morning of the accident, he moved the airplane out of the hangar, washed it, and performed a preflight inspection following the published manufacturer's checklist. He indicated that he was particularly careful checking for bird nests or other hazards, because the airplane had not been flown in 4 months. He found the airplane to be in good condition with no issues. He then went to a business meeting and returned to the airplane that afternoon, inspected it again, and found no discrepancies. He and his passenger boarded the airplane with a few personal items, and no baggage. After removing and stowing the gust lock, he started the engine without difficulty. He let it warm up for several minutes, then proceeded to back taxi on the turf runway to the beginning of runway 36 for a takeoff to the north.

Prior to takeoff, the pilot performed an engine run-up which he described as "everything seemed normal, the engine sounded fine." During the takeoff roll, as the airplane reached a point on the runway where it would normally lift off (about 1,200 ft down the runway), he pulled back on the yoke, and the airplane "didn't want to fly." He recalled that the airspeed at that time was "close to 60 knots." He did not recall any engine instrument indications and noted that the engine sounded "normal." Once he realized that the airplane was not going to take off and a collision appeared imminent, he advised his passenger to prepare for impact. As the airplane approached a fence just beyond the departure end of the runway, he pulled back on the yoke and the airplane lifted off, flew over the fence, then descended and struck another fence before coming to rest in the driveway of his residence. The pilot then turned off the master switch and the fuel selector. After the accident he noticed that the flaps were in the "up" position but recalled that they were "down" when he started the takeoff roll.

The turf runway at 1NC2 was 1,700 feet-long by 60 feet-wide and was located at an elevation of 830 feet mean sea level (msl). The pilot reported that the turf had recently been mowed and the grass was "very short."

Examination of the airplane by a Federal Aviation Administrator (FAA) inspector revealed that the right wing was crushed and bent aft, outboard of the wing strut. The right aileron and flap were damaged. The left wing was crushed aft near its root. The outboard section of the right horizontal stabilizer sustained

impact damage consistent with striking a fence post, the right elevator balance horn was fractured and nearly separated from the elevator. The firewall and forward fuselage were buckled.

Examination of the engine by a National Transportation Safety Board investigator revealed that the two-bladed propeller remained attached to the crankshaft. One blade exhibited an s-bend and was twisted. The other blade was bent aft about 50º. Both blade surfaces exhibited chordwise scratching signatures. The carburetor was attached at the mount pad; the intake system remained partially attached to the carburetor. The intake was clear of obstructions or debris. The carburetor was removed and partially disassembled. The finger screen was absent of debris and the single plastic float was intact. The carburetor bowl contained about 2 oz. of clean, blue-colored fuel, with no water or contaminants noted. The accelerator pump was operated manually and pumped fuel from the outlet line. The fuel gascolator was also examined. The bowl was removed and contained about 2 oz. of clean, blue-colored fuel with no water or contaminants noted.

The six top spark plugs were removed for examination. The fine-wire electrodes were normal in wear and when compared to a Champion Check-A-Plug chart. The Nos. 1, 3, and 6 electrodes had surface rust on the circumferences. The Nos. 2 and 5 electrodes were dark gray in color. The other plugs exhibited gray color. The cylinder rocker covers were removed for the examination. The crankshaft was rotated by hand-turning the propeller. Compression and suction were observed on the Nos. 2, 4, 3, and 5 cylinders, and valve action was correct on all cylinders. The No. 5 cylinder pushrods were impact damaged. The Nos. 1 and 6 cylinders were examined using a lighted borescope; no anomalies were noted other than scoring on the cylinder walls. The ignition harness leads were damaged and/or severed by impact forces. The dual magneto remained attached at the mount pad. The magneto produced spark on all leads when the crankshaft was rotated manually.

According FAA records, the pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA third-class medical certificate was issued October 28, 2015. A review of the pilot's logbook revealed that he had accrued 986 total hours of flight experience, of which 90 hours were in the accident airplane, as of January 16, 2017.

Review of the airplane's maintenance records revealed that the most recent annual inspection was completed on September 10, 2016, about 19 flight hours prior to the accident. The engine had accrued 1,822 hours since new.

At 1320, the reported weather at Statesville Municipal Airport (SVH), Statesville, North Carolina, about 10 nautical miles northwest of the accident site included wind from 080° at 5 knots, the temperature was 22° C, and the dew point was 11° C.

The pilot reported that the gross weight of the airplane at the time of the accident was 2,727 lbs. Review of takeoff performance data in a pilot operating handbook for the make and model airplane revealed that at a gross weight of 2,800 lbs, at 20°C, at 1,000 feet msl pressure altitude, the airplane required a ground roll of about 840 ft for a turf runway The data assumed the flaps were set to 20° extension.

An electronic engine monitor was retained and forwarded to the National Transportation Safety Board Vehicle Recorder Laboratory, Washington, DC. Review of downloaded data revealed that the accident takeoff was not recorded.

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Private | **Age:** | 50,Male |
| **Airplane Rating(s):** | Single-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 Without waivers/limitations | **Last FAA Medical Exam:** | October 28, 2015 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | March 10, 2015 |
| **Flight Time:** | 986 hours (Total, all aircraft), 90 hours (Total, this make and model), 924 hours (Pilot In Command, all aircraft), 6 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | Cessna | **Registration:** | N2383C |
| **Model/Series:** | R182 NO SERIES | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1978 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | R18200171 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | September 10, 2016 Annual | **Certified Max Gross Wt.:** | 3100 lbs |
| **Time Since Last Inspection:** | 19 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 1822 Hrs at time of accident | **Engine Manufacturer:** | LYCOMING |
| **ELT:** | Installed, activated, did not aid in locating accident | **Engine Model/Series:** | O-540 |
| **Registered Owner:** | SCOTT ATWELL INSURANCE SERVICES INC | **Rated Power:** | 235 Horsepower |
| **Operator:** | SCOTT ATWELL INSURANCE SERVICES INC | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KSVH,965 ft msl | **Distance from Accident Site:** | 10 Nautical Miles |
| **Observation Time:** | 13:20 Local | **Direction from Accident Site:** | 307° |
| **Lowest Cloud Condition:** | | **Visibility** | 10 miles |
| **Lowest Ceiling:** | Broken / 4700 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 5 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 80° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.06 inches Hg | **Temperature/Dew Point:** | 22°C / 11°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Mooresville, NC (1NC2) | **Type of Flight Plan Filed:** | None |
| **Destination:** | KINGSTON, TN (12TN) | **Type of Clearance:** | None |
| **Departure Time:** | 14:25 Local | **Type of Airspace:** | Class G |

## Airport Information

| | | | |
|---|---|---|---|
| **Airport:** | ATWELL 1NC2 | **Runway Surface Type:** | Grass/turf |
| **Airport Elevation:** | 830 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 36 | **IFR Approach:** | None |
| **Runway Length/Width:** | 1700 ft / 60 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 1 None | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 None | **Latitude, Longitude:** | 35.660831,-80.789443(est) |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Brazy, Douglass |
| **Additional Participating Persons:** | Robert Reynolds; FAA/FSDO; Charlotte, NC |
| **Original Publish Date:** | November 6, 2019 |
| **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=94941 |