



National Transportation Safety Board Aviation Accident Final Report

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| Location: | Colorado Springs, CO | Accident Number: | CEN13LA539 |
| Date & Time: | 09/04/2013, 0758 MDT | Registration: | N211AS |
| Aircraft: | CESSNA T207 | Aircraft Damage: | Substantial |
| Defining Event: | Loss of control in flight | Injuries: | 2 Minor |
| Flight Conducted Under: | Part 91: General Aviation - Aerial Observation | | |

Analysis

The pilot reported that he performed the takeoff with the airplane at gross weight and with the flaps up and the engine set for maximum power, which he verified by reading the instruments. During the takeoff, the airplane accelerated and achieved liftoff about 65 to 70 mph and then climbed a couple hundred feet before the pilot began to lower the nose to accelerate to normal climb speed (90 to 100 mph). The airplane then stopped climbing and would not accelerate more than 80 mph. While the pilot attempted to maintain altitude, the airplane decelerated to 70 mph with the engine still at the full-power setting. With insufficient runway remaining to land, the pilot made a shallow right turn toward lower terrain and subsequently made a hard landing in a field.

The pilot likely allowed the airplane to climb out of ground effect before establishing a proper pitch attitude and airspeed for the climb, which resulted in the airplane inadvertently entering a “region of reversed command” at a low altitude. In this state, the airplane may be incapable of climbing and would require either more engine power or further lowering of the airplane’s nose to increase airspeed. Because engine power was already at its maximum and the airplane was at a low altitude, the pilot was unable to take remedial action to fly out of the region of reversed command.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot’s failure to establish the proper pitch attitude and airspeed during takeoff with the engine at maximum power, which resulted in the exceedance of the airplane’s climb performance capability.

Findings

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| Aircraft | Airspeed - Not attained/maintained (Cause) Climb rate - Capability exceeded (Cause) Pitch control - Not attained/maintained (Cause) |
| Personnel issues | Aircraft control - Pilot (Cause) |

Factual Information

On September 4, 2013, about 0758 mountain daylight time, a Cessna T207 airplane, N211AS, sustained substantial damage during an off airport landing shortly after takeoff from runway 35L at the Colorado Springs Municipal Airport (COS), Colorado Springs, Colorado. The pilot reported that the airplane would not climb after takeoff and he executed a forced landing into a field. The pilot and passenger received minor injuries. The airplane sustained substantial damage to the wings and tail. The airplane was registered to and operated by Sanborn Map Company under the provisions of 14 Code of Federal Regulations Part 91 as an aerial observation flight. Visual meteorological conditions prevailed for the flight, which was operated on an instrument flight rules flight plan. The flight was originating at the time of the accident and was destined for the Lubbock Preston Smith International Airport (LBB), Lubbock, Texas.

The pilot reported that the engine start, taxi and pre-takeoff run-up were normal. He said that he performed the takeoff with the flaps up, boost pump off, cowl flaps open, gas on, and full rich mixture. On the takeoff roll, the throttle was advanced and engine instrument checked. He stated that the manifold pressure and propeller speed were at their maximum settings, and all other engine instruments were within normal operating parameters. The airplane accelerated and achieved liftoff about 65-70 mph. He stated that the airplane climbed a couple hundred feet and began to lower the nose to accelerate to normal climb speed (90-100 mph). He stated that he then noticed that the airplane stopped climbing and would not accelerate past 80 mph. He stated that while attempting to maintain altitude the airplane decelerated to 70 mph with the engine still at full power setting. With insufficient runway remaining to land, the pilot made a shallow right turn toward lower terrain and ultimately decided to make a landing in a field. The pilot reported that he was very surprised that with full power and in a descent that he was not able to keep the airspeed higher than 65-75 mph. During the off-airport landing the airplane landed hard and the pilot and passenger received minor injuries.

The reported weather at 0754 was: calm wind; 10 statute miles visibility; broken ceiling at 17,000 feet above ground level; temperature 21 degrees Celsius; dew point 12 degrees Celsius; altimeter setting 30.30 inches of mercury. Using the reported weather conditions, the density altitude was calculated to be about 8,000 feet above mean sea level. In the pilot's report, he listed the airplane's weight at the time of the accident as 3,790 pounds and the airplane's maximum gross weight as 3,800 pounds.

The airplane was a 1974 Cessna T207 airplane. It was powered by a turbo-normalized Continental TSIO-520-G engine rated to produce 300 horsepower. Using a Koch Chart, information provided by the pilot, the reported weather conditions, and takeoff performance information from the airplane manual, the takeoff ground run distance would have increased to about 2,640 feet, the distance to clear a 50 foot obstacle would have increased to about 4,728 feet, and the maximum rate of climb would have decreased to about 300 feet per minute. The takeoff performance was predicated on the use of 10 degrees of flap for takeoff.

The Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25A), in regard to airplane operation in the "region of reversed command", states:

"If during a soft-field takeoff and climb, for example, the pilot attempts to climb out of ground effect without first attaining normal climb pitch attitude and airspeed, the airplane may inadvertently enter the region of reversed command at a dangerously low altitude. Even with

full power, the airplane may be incapable of climbing or even maintaining altitude. The pilot's only recourse in this situation is to lower the pitch attitude in order to increase airspeed, which will inevitably result in a loss of altitude."

History of Flight

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| Initial climb | Loss of control in flight (Defining event) |
| Uncontrolled descent | Collision with terr/obj (non-CFIT) |

Pilot Information

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|---------------------------|---|-----------------------------------|------------|
| Certificate: | Airline Transport; Commercial | Age: | 41 |
| Airplane Rating(s): | Multi-engine Land; Single-engine Land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | |
| Instrument Rating(s): | None | Second Pilot Present: | No |
| Instructor Rating(s): | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane | Toxicology Performed: | No |
| Medical Certification: | Class 2 Without Waivers/Limitations | Last FAA Medical Exam: | 02/25/2013 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | 05/07/2012 |
| Flight Time: | 5200 hours (Total, all aircraft), 18 hours (Total, this make and model) | | |

Aircraft and Owner/Operator Information

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| Aircraft Make: | CESSNA | Registration: | N211AS |
| Model/Series: | T207 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | 20700259 |
| Landing Gear Type: | Tricycle | Seats: | 6 |
| Date/Type of Last Inspection: | 03/22/2013, Annual | Certified Max Gross Wt.: | 3800 lbs |
| Time Since Last Inspection: | | Engines: | 1 Reciprocating |
| Airframe Total Time: | 13482 Hours at time of accident | Engine Manufacturer: | CONT MOTOR |
| ELT: | Installed | Engine Model/Series: | TSIO-520 SER |
| Registered Owner: | Sanborn Map Company | Rated Power: | 300 hp |
| Operator: | Sanborn Map Company | Operating Certificate(s) Held: | None |

Meteorological Information and Flight Plan

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| Conditions at Accident Site: | Visual Conditions | Condition of Light: | Day |
| Observation Facility, Elevation: | COS, 6187 ft msl | Distance from Accident Site: | 0 Nautical Miles |
| Observation Time: | 0754 MDT | Direction from Accident Site: | 0° |
| Lowest Cloud Condition: | Clear | Visibility | 10 Miles |
| Lowest Ceiling: | Broken / 17000 ft agl | Visibility (RVR): | |
| Wind Speed/Gusts: | Calm / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 30.3 inches Hg | Temperature/Dew Point: | 21 °C / 12 °C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Colorado Springs, CO (COS) | Type of Flight Plan Filed: | IFR |
| Destination: | Lubbock, TX (LBB) | Type of Clearance: | IFR |
| Departure Time: | 0755 MDT | Type of Airspace: | |

Airport Information

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| Airport: | Colorado Springs Municipal (COS) | Runway Surface Type: | Asphalt |
| Airport Elevation: | 6187 ft | Runway Surface Condition: | Dry |
| Runway Used: | 35L | IFR Approach: | None |
| Runway Length/Width: | 11022 ft / 150 ft | VFR Approach/Landing: | Forced Landing |

Wreckage and Impact Information

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| Crew Injuries: | 2 Minor | Aircraft Damage: | Substantial |
| Passenger Injuries: | N/A | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 2 Minor | Latitude, Longitude: | 38.805833, -104.700833 |

Administrative Information

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|-----------------------------------|---|--------------|------------|
| Investigator In Charge (IIC): | John M Brannen | Report Date: | 11/13/2014 |
| Additional Participating Persons: | | | |
| Publish Date: | 11/13/2014 | | |
| Investigation Docket: | http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=88019 | | |

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).