Aviation Investigation Final Report

Location:	Ruidoso, New Mexico	**Accident Number:**	CEN10FA324
Date & Time:	June 17, 2010, 09:52 Local	**Registration:**	N310RH
Aircraft:	Cessna T310R	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	5 Fatal, 2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was on a visual flight rules cross-country flight and on approach to the airport. A witness, who saw the airplane when it was about 3 miles from the airport, described it as being high for a landing on the runway. He then said the airplane began a “gradual” descent, followed by a “rapid” nose-down descent before it went out of sight. Another witness stated that she saw the airplane suddenly go straight down. One of the passengers stated that, shortly before the accident, the wings were rocking and it felt like the airplane was “tossed around” by the wind. A postimpact fire ensued. An examination of the wreckage indicated that the airplane struck the ground in a 35-degree left bank and about a 52- to 57-degree nose down descent angle; the engines were operating at the time of impact. A postaccident examination of the airplane did not reveal any anomalies indicative of any systems problems prior to the accident. Given the statements of the witnesses, it is likely that the pilot, when he realized the airplane was high on approach, reduced the airplane’s airspeed and raised the nose in order to more rapidly decrease its altitude. The airplane then likely entered an aerodynamic stall, which would have caused the motion felt by the passenger as the airplane rapidly descended nose-down and began rotating before impacting the ground.

While the pilot was experienced in flying multi-engine airplanes, he only had 3.1 hours of flying experience in the accident airplane with a flight instructor and only 5 hours total time in the make and model. Although the investigation was unable to determine what role the pilot’s experience played in the accident, it is likely that his limited experience in the airplane contributed to his lack of airspeed maintenance.

The NTSB has long been concerned about the use of proper restraints in general aviation

airplanes. In this accident, an adult and an 11-year-old child were belted in the front passenger seat together. Title 14 Code of Federal Regulations 91.107(a)(3) states that each person "must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, takeoff, and landing." However, the regulation does not specify that all passengers occupy separate seats. On August 11, 2010, the NTSB issued Safety Recommendation A-10-121 asking the FAA to "amend 14 Code of Federal Regulations Part 91 to require separate seats and restraints for every occupant." The Safety Recommendation is classified "Open—Unacceptable Response," since the FAA's proposed clarification of the rule does not discourage or prohibit the unsafe practice of allowing multiple occupants to share a seat and/or restraint system and does not provide clear guidance to general aviation pilots regarding seat belt and seating requirements.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot did not maintain proper airspeed on final approach for landing, which resulted in an aerodynamic stall and impact with terrain. Contributing to the accident was the pilot's limited experience in the airplane make and model.

Findings

Personnel issues	Incorrect action performance - Pilot
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

Approach	Aerodynamic stall/spin (Defining event)

This report was modified on May 24,2012. Please see the docket for this accident to view the original report.

HISTORY OF FLIGHT

On June 17, 2010, about 0952 Mountain Daylight Time (MDT), a twin-engine Cessna T310R airplane, N310RH was substantially damaged during impact with terrain while on final approach for landing at the Sierra Blanca Regional Airport (SRR), Ruidoso, New Mexico. A post-crash fire ensued. The private pilot and four passengers on board were fatally injured, and two passengers were seriously injured. The airplane was registered to and operated by Rod Aviation LLC of Granbury, Texas. Visual meteorological conditions prevailed and no flight plan was filed for the 14 Code of Federal Regulations Part 91 personal cross-country flight. The flight originated from the Granbury Regional Airport (GDJ), Granbury, Texas, around 0630 MDT, with its final destination SRR.

A friend of the pilot reported that the pilot and a male passenger departed GDJ for Cleburne, Texas, to pick up two women and three children at the Cleburne Municipal Airport (CPT). The friend stated that the pilot elected to do this because the runway at CPT was much longer than the one at GDJ, and that he wanted the additional runway length to compensate for the added weight and longer takeoff run.

The CPT airport manager reported that the airplane landed, taxied to and parked in front of the terminal building around 0710 MDT. With both engines operating, the five passengers boarded the airplane, the airplane taxied to the runway and it departed. The airport manager added that no fueling services were provided.

At SRR, line service personnel reported hearing the pilot transmit over the common traffic advisory frequency that he was 30 miles east of the airport and was inbound to land on runway 24. The pilot transmitted again when he was 10 miles east of the airport. Right after that, two of the line personnel got into a golf cart and drove out on to the ramp to wait for the arriving airplane. They first saw the airplane when it was approximately three miles out. The line foreman, who had worked at SRR for 25 years, said that the airplane was a “little high” on the approach. He then saw the airplane begin a “gradual” descent, followed by a “rapid” descent. The foreman estimated that the airplane was descending at a 60 degree nose down angle when it went out of sight. Moments later, dust was seen rising over the area where they lost sight of the airplane.

One of the surviving passengers stated that shortly before the accident, the airplane's wings were rocking and it felt like the airplane was being tossed around by wind. The next thing he recalled was directing first responders to those persons still in the airplane.

PERSONNEL INFORMATION

The pilot, age 49, held a private pilot certificate with a single-engine and multi-engine land airplane rating. A review of the pilot's records showed he had successfully completed a flight review on September 23, 2009.

According to insurance records, on March 11, 2010, the pilot reported having 842 total flying hours. Of that time, 156 hours was reported as multi-engine airplane time. The pilot also reported having 5 hours in the make and model of airplane. A provision listed on his insurance policy for the airplane stated that the pilot was required to receive five hours of dual time with a flight instructor in a Cessna 310, to include three hours of instrument dual flight time, before the pilot would be insured to fly solo in the airplane.

On April 26, 2010, the pilot logged 3.1 hours with a flight instructor in the accident airplane. No other records of flights conducted after this date was found.

The pilot held a current Third Class medical certificate with no limitations or waivers, dated September 21, 2009.

AIRCRAFT INFORMATION

The airplane was a 1980 Cessna Aircraft Company, Model T310R, serial number 310R1878. The airplane was powered by two Continental Motors, TSIO-520-BB fuel-injected engines rated at 285 horsepower each.

According to the airplane logbooks, the airplane underwent an annual inspection on March 16, 2010. The airplane's total airframe time at the annual inspection was 2,009.6 hours.

METEOROLOGICAL INFORMATION

At 0955 MDT, the automated weather observing system at SRR reported wind from 050 degrees at 5 knots, 10 statute miles visibility; clear of clouds, temperature 77 degrees Fahrenheit (F), dew point 36 degrees F, and a barometric pressure of 30.23 inches of Mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted in a low area of rolling grass-covered terrain surrounded by trees about 1/4-mile northeast of the approach end of the runway. The wreckage path followed a 235-degree magnetic heading for about 150 feet to where the airplane main wreckage came to

rest.

The accident site began with a ground scar that was about three feet wide, one to two feet deep, and 35 to 40 feet in length. About ten feet from the start of the ground scar were several gouges and deep slashes in the dirt that ran parallel to the wreckage path. About 70 feet from the start of the ground scar was the left propeller and a piece of the left wing. The propeller was broken off at the flange mounting bolts. The bolts that were found in the flange showed torsional overload fractures. The propeller blades showed torsional bending, chordwise scratches and nicks along the leading edges.

Just past the left propeller was a debris field that extended south for about 75 feet and west to the airplane main wreckage. Within the debris field were pieces of metal structure from the airplane's nose, the nose landing gear, pieces of the windscreen, engine accessories, luggage and clothes. About midway along the debris field embedded in the ground was the airplane's right propeller. One blade was broken out of the propeller hub and was buried in the ground just forward of the hub. All three blades were bent torsionally, and showed chordwise scratches and nicks along the leading edges and tips.

The debris field ended at the airplane main wreckage. The main wreckage consisted of the cabin area, the right wing, right wing tip tank, the left wing to just inboard of the tip tank, the right engine, the left and right main landing gear, the aft baggage compartment, aft fuselage, and the empennage. The main wreckage was oriented on about a 315 degree magnetic heading.

The cabin area was broken open and upward. The instrument panel, glareshield, and several of the seats were broken out. The wing sections were bent upward and back onto the remains of the aft cabin and baggage area. The flaps were extended to 20 degrees. The main landing gear was extended. The inboard left wing showed aft crushing to the forward spar from the fracture inboard to the engine nacelle. The right wing was intact but showed aft bends and buckling. The right tip tank was partially detached and was bent downward and crushed rearward at the nose. The right engine remained attached to its mounts and was found pinned beneath the inverted nacelle and the right side of the fuselage. The aft fuselage was bent and twisted approximately 30 degrees counterclockwise along the longitudinal axis. The left horizontal stabilizer and elevator, and the vertical stabilizer and rudder were intact. The right horizontal stabilizer and elevator were bent upward 10 degrees about two feet inboard from the tip. Flight control continuity was confirmed to all control surfaces.

A burned area of grass and brush extended from forward and west –northwest of main wreckage to the trees. Just west of the main wreckage, in the burned area were four of the cabin seats. All four seats were broken and had sustained damage from fire. One of the seats; the cushions were consumed by fire. The remaining frame was charred and melted.

On the edge of where the burned area began, and about 30 feet north-northeast of the main wreckage was the outboard section of the left wing and tip tank. It was bent upward and

broken aft at the inboard fractured area. The front portion of the wing tank tip was crushed up and inward. Dirt and grass was embedded in the fractures and metal seams. Measurements of the crush angle at the wing tip tank and bottom surface of the broken wing section showed the airplane struck the ground in about a left 35-degree bank angle and at a 52 to 57-degree nose down descent angle.

About 60 feet northwest of the main wreckage, lying upright next to a small water tank was the airplane's left engine. An examination of the flange showed elongation of bolt holes where the propeller mounting bolts had fractured. Remaining bolt pieces in the flange showed they were fractured in overload.

The airplane was retained for further examination.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted by the Office of the Medical Examiner, in Albuquerque, New Mexico on June 18, 2010. The medical examiner concluded that the pilot died from blunt force injuries sustained in the crash.

Results of toxicology testing of samples taken were negative for all tests conducted.

TESTS AND RESEARCH

The airplane was examined at Ruidoso, New Mexico, on June 18 and 19, 2010.

An examination of the airplane's wing flap motor, drive sprockets, and chains confirmed the left and right flaps were in the 20 degree down position.

The left fuel selector handle was positioned on the right main fuel tank. The left fuel selector valve was in the off position. The right fuel selector handle was observed positioned on the left main fuel tank. The right fuel selector valve was in the off position. The right fuel selector valve bowl was removed and contained residual fuel that tested negative for water contamination.

Both engines were partially disassembled and an examination and testing was conducted. Boroscope examination of each engine showed all pistons and valves intact and properly functional. Continuity testing of each engine showed that the crankshafts, camshafts and all piston rods were properly connected and functional. Engine accessories were examined and tested. All proved to function properly. An examination of the turbochargers showed rotational scoring on the impeller shroud, indicative of rotation at impact. The examinations did not reveal any abnormalities that would have prevented normal operation and production of rated horsepower in either engine.

A review was conducted of the airplane's weight and balance and center of gravity charts.

Based on the estimated fuel that would have been on board at the time of the approach, and on the weight of the persons on board and of baggage found at the accident site, it was determined that the airplane was within the proper center of gravity at the time of the accident.

ADDITIONAL INFORMATION

According to the 1980 Cessna Aircraft Company Model T310R Pilot Operating Handbook, the airplane is designed to hold six people total; two persons in the left and right front pilots' seats, two persons in the left and right middle passenger seats, and two persons in the left and right rear passenger seats. The front two seats are equipped with lap belts and shoulder harnesses. The middle and rear seats are equipped with lap belts.

The NTSB has long been concerned about the use of proper restraints in general aviation airplanes. In this accident, an adult and an 11-year-old child were belted in the front passenger seat together. Title 14 Code of Federal Regulations 91.107(a)(3) states that each person "must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, takeoff, and landing." However, the regulation does not specify that all passengers occupy separate seats. On August 11, 2010, the NTSB issued Safety Recommendation A-10-121 asking the FAA to "amend 14 Code of Federal Regulations Part 91 to require separate seats and restraints for every occupant." The Safety Recommendation is classified "Open—Unacceptable Response," since the FAA's proposed clarification of the rule does not discourage or prohibit the unsafe practice of allowing multiple occupants to share a seat and/or restraint system and does not provide clear guidance to general aviation pilots regarding seat belt and seating requirements.

Pilot Information

Certificate:	Private	**Age:**	49,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	September 21, 2009
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 23, 2009
Flight Time:	842 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N310RH
Model/Series:	T310R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310R1878
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	March 16, 2010 Annual	**Certified Max Gross Wt.:**	5500 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	2009 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-520 SER
Registered Owner:	Rod Aviation LLC	**Rated Power:**	300 Horsepower
Operator:	Rod Aviation LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SRR,6814 ft msl	**Distance from Accident Site:**	
Observation Time:	09:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	50°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.22 inches Hg	**Temperature/Dew Point:**	25°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Granbury, TX (GDJ)	**Type of Flight Plan Filed:**	None
Destination:	Ruidoso, NM (SRR)	**Type of Clearance:**	None
Departure Time:	07:30 Local	**Type of Airspace:**	Unknown

Airport Information

Airport:	Sierra Blanca Regional Airport SRR	**Runway Surface Type:**	
Airport Elevation:	6814 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 Fatal, 2 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Fatal, 2 Serious	**Latitude, Longitude:**	33.468612,-105.508613

Administrative Information

Investigator In Charge (IIC):	LeBaron, Timothy
Additional Participating Persons:	John Wagner; Federal Aviation Administration; Albuquerque, NM Andrew Swick; Teledyne Continental Motors, Inc; Rancho Cordova, CA Peter J Basile; Cessna Aircraft Company; Wichita, KS
Original Publish Date:	May 24, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=76348