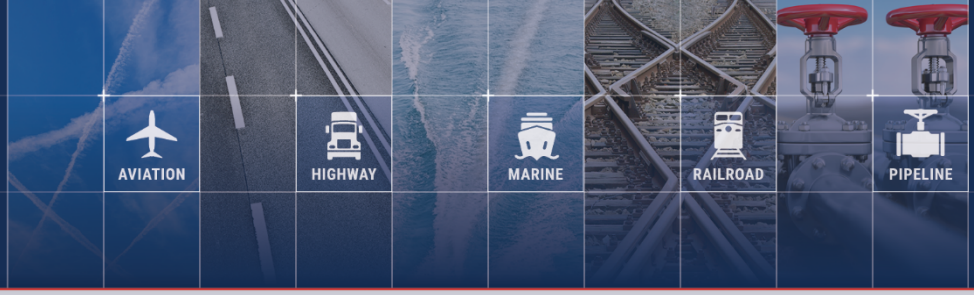


# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Pierre, South Dakota | **Accident Number:** | CEN12FA579 |
| **Date & Time:** | August 28, 2012, 09:49 Local | **Registration:** | N416 |
| **Aircraft:** | LEE PAUL SQ 2000 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Loss of control in flight | **Injuries:** | 1 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

During the airplane's initial takeoff climb, two ground witnesses observed the left "gull-wing" entrance door to be open. They reported that when the airplane was about 50 feet above the ground, it entered a series of approximately four pitch oscillations. During the last pitch-down oscillation, the airplane impacted the runway at a steep descent angle and then skidded forward about 500 feet, coming to a stop near the right side of the runway. A postimpact fire ensued. Examination of the airframe, engine, propeller and the door did not reveal any anomalies associated with a preimpact failure or malfunction.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The airplane's entry into a pilot-induced oscillation and the pilot's loss of airplane control during the takeoff initial climb. Contributing to the accident was the left entrance door opening in flight for undetermined reasons.

### Findings

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|---|---|
| **Personnel issues** | Aircraft control - Pilot |
| **Aircraft** | Pitch control - Incorrect use/operation |
| **Aircraft** | Passenger/crew doors - Unintentional use/operation |

# Factual Information

## History of Flight

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|---|---|
| **Initial climb** | Miscellaneous/other |
| **Initial climb** | Loss of control in flight (Defining event) |

HISTORY OF FLIGHT

On August 28, 2012, about 0949 central daylight time, a Lee SQ-2000 experimental airplane, N416, owned and operated by the pilot, was substantially damaged during takeoff from Pierre Regional Airport (KPIR), Pierre, South Dakota. The certificated private pilot was fatally injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed during the flight. No flight plan was filed. The local flight was originating at the time of the accident.

On takeoff leg at about 50 feet above the ground, two witnesses observed the left “gull-wing” entrance door to be open and the airplane enter into a series of four up and down pitch oscillations. During the last pitch down oscillation, the airplane impacted the runway at a steep descent angle.

PERSONNEL INFORMATION

The pilot of N416, age 69, held a private pilot certificate with an airplane single-engine land rating. On October 5, 2011, the pilot was issued a limited third-class medical certificate, with the limitation that corrective lenses be worn while flying. At the time of the medical examination, the pilot reported having 330 hours of flight experience, with 2 hours in the last six months.

AIRCRAFT INFORMATION

The accident airplane was a KLS Composites (Kit), SQ-2000, which the pilot purchased on December 25, 2001. The airplane was issued a special airworthiness certificate on March 18, 2004. During April 2012, the pilot completed the installation of a Continental IO-360C engine. The pilot maintained detailed construction records of the accident airplane, to include construction of the “gull-wing” entrance doors. In these records, the pilot wrote that during flight it was very easy to open the doors and had constructed a door lock “clip” to prevent inadvertent opening of the entrance door closing mechanism. In these records, the pilot also described the aircraft being very pitch sensitive.

METEOROLOGICAL INFORMATION

At 0953, the KPIR automated weather observation system reported the following weather conditions: Wind 090 degrees at 8 knots; sky clear; temperature 27 degrees Celsius (C); dew point 17 degrees C; altimeter setting 29.93 inches of mercury.

## WRECKAGE AND IMPACT INFORMATION

Following impact with the runway, the airplane slid to a stop on the edge of the runway and a postimpact fire ensued. The distance from initial runway impact to the main wreckage location was about 500 feet.

During examination, the engine crankshaft was rotated and a compression check was confirmed on all cylinders. Propeller impact with the runway resulted in the shredding of over half of the propeller's diameter. Flight control surfaces were accounted for, although flight control continuity could not be confirmed due to impact and fire damage. Examination of the airframe, engine and propeller did not reveal any anomalies associated with a preimpact failure or malfunction.

Both "gull-wing" entrance doors separated from the airplane during the impact sequence and were not fire damaged. Examination of the left entrance "gull-wing" door revealed a witness mark corresponding to the door closing mechanism in a "partially closed" position. Extensive fire damage of the fuselage surrounding the left entrance door prevented further analysis of door failure.

## MEDICAL AND PATHOLOGICAL INFORMATION

On August 30, 2012, an autopsy was performed on the pilot at the Rapid City, South Dakota Regional Hospital. The cause of death was attributed to blunt force injuries. The FAA's Civil Aeromedical Institute in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. No carbon monoxide, cyanide, or drugs were detected in the blood, and no ethanol was detected in vitreous.

## Pilot Information

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|---|---|---|---|
| **Certificate:** | Private | **Age:** | 69,Male |
| **Airplane Rating(s):** | Single-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 With waivers/limitations | **Last FAA Medical Exam:** | October 5, 2011 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | (Estimated) 346 hours (Total, all aircraft), 4 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | LEE PAUL | **Registration:** | N416 |
| **Model/Series:** | SQ 2000 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | Yes |
| **Airworthiness Certificate:** | Experimental (Special) | **Serial Number:** | 0007 |
| **Landing Gear Type:** | Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | Unknown | **Certified Max Gross Wt.:** | 2250 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-360 |
| **Registered Owner:** | On file | **Rated Power:** | 210 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KPIR,1744 ft msl | **Distance from Accident Site:** | 0 Nautical Miles |
| **Observation Time:** | 09:53 Local | **Direction from Accident Site:** | 360° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 8 knots / None | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 90° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.93 inches Hg | **Temperature/Dew Point:** | 27°C / 17°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Pierre, SD (KPIR) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Pierre, SD (KPIR) | **Type of Clearance:** | None |
| **Departure Time:** | 09:49 Local | **Type of Airspace:** | |

## Airport Information

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|---|---|---|---|
| **Airport:** | Pierre Regional Airport KPIR | **Runway Surface Type:** | Asphalt |
| **Airport Elevation:** | 1744 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 13 | **IFR Approach:** | None |
| **Runway Length/Width:** | 6900 ft / 100 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | On-ground |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | |
| **Total Injuries:** | 1 Fatal | **Latitude, Longitude:** | 44.37611,-100.284721 |

## Administrative Information

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|---|---|
| **Investigator In Charge (IIC):** | Folkerts, Michael |
| **Additional Participating Persons:** | Gary Soldwisch; FAA FSDO; Rapid City, SD |
| **Original Publish Date:** | February 27, 2013 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=84829 |