# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Sarasota, Florida | **Accident Number:** | ERA14LA383 |
| **Date & Time:** | August 12, 2014, 11:52 Local | **Registration:** | N50XV |
| **Aircraft:** | CHRISTEN INDUSTRIES INC PITTS S | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Fuel exhaustion | **Injuries:** | 2 Minor |
| **Flight Conducted Under:** | Part 91: General aviation - Instructional | | |

## Analysis

The flight instructor reported that, during a preflight inspection of the aerobatic airplane, he noted that it had about 15 gallons of fuel on board. After about 45 minutes of instructional aerobatic flight, the engine lost total power. The flight instructor chose to perform a forced landing to a beach, and, during the landing roll, the airplane nosed over and then came to rest inverted, which resulted in substantial damage to the fuselage and empennage.

A postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. During the recovery, about 1 gallon of fuel was drained from the fuel tanks. Additionally, the fuel line was found absent of fuel. The two fuel tanks had a total capacity of about 30 gallons, 1 gallon of which was unusable. Although the pilot estimated that the engine typically consumed about 11 gallons of fuel per hour, the engine manufacturer's Airplane Operating Manual indicated that the engine consumed about 15 gallons of fuel per hour when operated at high-power settings. Assuming this consumption rate, the airplane had about 1 hour of fuel available for the flight at the time of departure, not taking into account the fuel required for engine start, taxi, run-up, and takeoff. Given the quantity of fuel the flight instructor estimated was on board before the flight and the quantity of fuel recovered from the airplane, it is likely that the engine lost power due to fuel exhaustion because of the flight instructor's inadequate preflight planning.

## Probable Cause and Findings

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

A total loss of engine power due to fuel exhaustion, which resulted from the flight instructor's inadequate preflight fuel planning.

## Findings

| | |
|---|---|
| **Personnel issues** | Fuel planning - Instructor/check pilot |
| **Aircraft** | Fuel - Fluid level |
| **Environmental issues** | (general) - Contributed to outcome |

# Factual Information

## History of Flight

| | |
|---|---|
| **Maneuvering** | Fuel exhaustion (Defining event) |
| **Maneuvering** | Loss of engine power (total) |
| **Emergency descent** | Off-field or emergency landing |
| **Landing-landing roll** | Nose over/nose down |

On August 12, 2014, at 1152 eastern daylight time, a Christian Industries Pitts S2B, N50XV, was substantially damaged during a forced landing to a beach following a total loss of engine power near Sarasota, Florida. The flight instructor and private pilot under instruction sustained minor injuries. Visual meteorological conditions prevailed, and no flight plan was filed for the instructional flight, that departed Sarasota/Bradenton International Airport (SRQ), Sarasota, Florida, about 1105. The airplane was registered to and operated by an individual under the provisions of Title 14 Code of Federal Regulations Part 91.

During an interview with a local law enforcement officer, the flight instructor indicated that he performed a preflight inspection of the airplane prior to departing for the aerobatic instructional flight. He stated that he "thought he had about 15 gallons of fuel," and the engine fuel consumption was about 11 gallons per hour. After about 45 minutes of flight time, while returning to their base airport, at an altitude about 5,000 feet above ground level, the engine experienced a total loss of power. The flight instructor elected to land the airplane on a beach. During the landing roll, the airplane nosed over and came to rest inverted in the water, and incurred substantial damage to the fuselage and empennage.

According to FAA records, the airplane was issued a normal and aerobatic airworthiness certificate in 2013. It was powered by a Lycoming AEIO-540-D4A5, 260 hp, engine. According to maintenance logbooks, the most recent annual inspection was completed on August 22, 2013. At the time of the inspection, the airplane had accumulated 905 hours of total time in service.

A postaccident examination of the airplane revealed that the fuel tanks contained a total of one gallon of blue fluid, similar in color and smell as 100LL aviation fuel. In addition, the engine was examined and engine continuity of the powertrain was confirmed from the propeller flange to the accessory section of the engine. Compression was confirmed on all cylinders using the thumb method, and the spark plugs were and exhibited normal wear. During the examination, the fuel line to the engine was removed and was devoid of any fluid.

According to the airplane Pilot's Operating Handbook (POH), the airplane was equipped with a 24 gallon main fuel tank and a 5 gallon auxiliary wing fuel tank. The 5 gallon wing tank was not to be used during aerobatic operations. In addition, the main fuselage tank contained 1 gallon of unusable fuel. Lastly, the POH had a warning that stated, "DO NOT PERFORM LOW ALTITUDE AEROBATICS WITH LESS THAN 1/4 OF FUEL IN FUSELAGE TANK."

According to the engine manufacturer's Operator's Manual, the engine had an average fuel consumption of 15 gallons per hour while operating at 75% of rated power.

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Airline transport; Commercial; Flight instructor | **Age:** | 75,Male |
| **Airplane Rating(s):** | Single-engine land; Single-engine sea; Multi-engine land | **Seat Occupied:** | Rear |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 5-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | Airplane multi-engine; Airplane single-engine; Instrument airplane | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 3 Without waivers/limitations | **Last FAA Medical Exam:** | April 8, 2013 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | March 30, 2013 |
| **Flight Time:** | 21627 hours (Total, all aircraft), 193 hours (Total, this make and model), 21500 hours (Pilot In Command, all aircraft), 18 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft) | | |

## Student pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Private | **Age:** | Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Front |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 5-point |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 3 | **Last FAA Medical Exam:** | April 1, 2015 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 200 hours (Total, all aircraft) | | |

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | CHRISTEN INDUSTRIES INC | **Registration:** | N50XV |
| **Model/Series:** | PITTS S 2B | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1987 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Aerobatic; Normal | **Serial Number:** | 5109 |
| **Landing Gear Type:** | Tailwheel | **Seats:** | |
| **Date/Type of Last Inspection:** | August 13, 2013 Annual | **Certified Max Gross Wt.:** | 1700 lbs |
| **Time Since Last Inspection:** | 13 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 918 Hrs at time of accident | **Engine Manufacturer:** | Lycoming |
| **ELT:** | C91A installed, activated, did not aid in locating accident | **Engine Model/Series:** | AEIO-540-D4A5 |
| **Registered Owner:** | On file | **Rated Power:** | 260 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | SRQ,27 ft msl | **Distance from Accident Site:** | 10 Nautical Miles |
| **Observation Time:** | 15:53 Local | **Direction from Accident Site:** | 350° |
| **Lowest Cloud Condition:** | Few / 3300 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 12 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 240° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.03 inches Hg | **Temperature/Dew Point:** | 33°C / 22°C |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | Sarasota, FL (SRQ ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Sarasota, FL (SRQ ) | **Type of Clearance:** | Unknown |
| **Departure Time:** | 11:00 Local | **Type of Airspace:** | |

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 2 Minor | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 Minor | **Latitude, Longitude:** | 27.232221,-82.524169(est) |

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Moats, Heidi |
| **Additional Participating Persons:** | Angel Figueroa; FAA/FSDO; Tampa, FL |
| **Original Publish Date:** | January 21, 2016 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=89865 |