Aviation Investigation Final Report

Location:	Oceanside, California	**Accident Number:**	WPR14LA329
Date & Time:	August 5, 2014, 11:15 Local	**Registration:**	N88EW
Aircraft:	CHRISTEN INDUSTRIES INC PITTS S 2B	**Aircraft Damage:**	Substantial
Defining Event:	Fuel starvation	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, following spin practice in a local practice area, he leveled the airplane and noticed that the bubble within the fuel sight gauge was not visible. As the pilot began to return to the departure airport, the engine began to run rough. The pilot immediately diverted to a nearby airport, and, shortly after diverting, the engine lost power. The pilot performed a left circling approach to the runway; however, he realized he was too high as he turned onto the base leg of the traffic pattern. The pilot then performed a left sideslip to increase the rate of descent. He did not think that he was in a safe position to land and performed a right 270-degree turn. The pilot stated that, during the turn, he realized the airplane would not be able to reach the runway, and he initiated a forced landing to an open field. Subsequently, the airplane landed hard and nosed over. The pilot reported that before the flight he thought that he had three-quarters of a tank of fuel onboard the airplane, which he thought was sufficient for a 30-minute flight plus visual flight rules reserve fuel requirements.

Postaccident examination of the airplane revealed that when the main fuel tank fuel cap was removed, about 1 to 2 cups of liquid drained from the fuel tank. The engine was test run while installed on the airframe without incident. In addition, the fuel indicating system was found to function normally and no leaks were observed within the fuel system. Further examination of the airplane revealed no preexisting mechanical anomalies that would have precluded normal operation.

Probable Cause and Findings

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

The total loss of engine power due to fuel exhaustion. Contributing to the accident was the pilot's inadequate fuel planning.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot

Factual Information

History of Flight

Enroute-cruise	Fuel starvation (Defining event)
Enroute-cruise	Off-field or emergency landing
Enroute-cruise	Collision with terr/obj (non-CFIT)

On August 5, 2014, about 1115 Pacific daylight time, a Christian Industries Inc. Pitts-S2B, N88EW, was substantially damaged during a forced landing near the Oceanside Municipal Airport (OKB), Oceanside, California. The airplane was registered to and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The airline transport rated pilot and his passenger were not injured. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight. The local flight originated from the Mc Clellan-Palomar Airport (CRQ), Carlsbad, California, about 1047.

In a written statement, dated August 6, 2014, the pilot reported to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), that prior to takeoff; he noted that he had three-quarters of a tank of fuel onboard the airplane, which he felt was enough fuel for a 30 minute flight plus visual flight rules reserve fuel requirements. The pilot departed and flew to an area to conduct spin practice and noted that the fuel gauge still indicated three-quarters of a tank of fuel. After performing several spins for about 15 minutes, he leveled off noticed that the fuel sight gauge was full of fuel and no air bubble was observed. The pilot added that this was not unusual following aerobatic maneuvers. The pilot proceeded to fly towards CRQ. The pilot stated that at this time, the engine began to run rough. The pilot verified the oil pressure and the fuel sight gauge, which indicated below one-half a tank of fuel. He added that the fuel level in the sight gauge varied depending on throttle position. The pilot further stated that he decided to divert to OKB and shortly after, the engine lost power.

As the pilot neared OKB, he performed a left circling approach to runway 24, however, realized he was too high as he turned onto base leg for the runway. The pilot then performed a left side slip to increase the rate of descent and did not feel he was in a safe position to land. The pilot stated that he decided to perform a right 270-degree turn. The pilot said that during the turn, he realized he would not be able to make it to the runway and initiated a forced landing to an open field. Subsequently, the airplane landed hard and nosed over in an open field about 200 yards from the approach end of runway 24.

During a telephone conversation with the pilot on August 5, 2014, the pilot reported that prior to takeoff; he noted that he had three-quarters of a tank of fuel onboard the airplane and departed to perform aerobatics/spin practice nearby. The pilot stated that following the completion of a few aerobatic maneuvers, he remained at a higher altitude because the engine was running rough and shortly after, he noticed that the fuel sight gauge bubble had disappeared from view. The pilot further stated that as the engine continued to run erratic, he diverted to Oceanside followed by the engine losing power. The pilot added that while the engine was running erratic, the oil pressure appeared lower than normal. When asked where the three-quarters of a tank of fuel went, the pilot replied that there must have been a leak in the system that caused the engine to run out of fuel.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that both wings and fuselage were structurally damaged. Prior to movement of the airplane, the FAA inspector removed the main fuel tank fuel cap and observed approximately one to two cups of liquid expel from the tank. The airplane was recovered to a secure location for further examination.

Examination of the recovered airframe and the Lycoming AEIO-540-D4A5 engine revealed that the upper and lower wings were removed to facilitate transport of the wreckage. Wreckage recovery personnel reported that no fuel was observed within the upper wing header tank prior to removal of the upper wing. About 1 or 2 ounces of fuel was removed from the fuel line that extends from the fuel metering unit to the engine driven fuel pump. The liquid was bright blue in color and free of debris. About 2 to 3 ounces of liquid, yellow in color was removed from the fuel selector valve strainer. About 1 ounce of liquid was removed from the fuel transfer valve drain. All liquid removed tested negative for water when using water finding paste. All of the fuel lines remained attached and secure to their respective attach points. No evidence of any fuel leaks was observed.

Prior to an engine run, the airplane was placed in a near level attitude. About 5 Gallons of fuel was added to the main fuel tank and the fuel gauge displayed about 1/4 of a tank once the fuel was added. About 5 more gallons of fuel was added to the fuel tank and the gauge indicated about 1/2 of a tank. The engine was primed using the airframe boost pump and subsequently started. Due to propeller damage, the engine was run at an idle power setting for about 5 minutes uneventfully before it was shut down using the mixture lever. No mechanical anomalies were noted during the examination of the engine or airframe that would have precluded normal operation.

Pilot Information

Certificate:	Airline transport	**Age:**	43
Airplane Rating(s):	Single-engine land; 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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	February 3, 2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 16, 2014
Flight Time:	10800 hours (Total, all aircraft), 50 hours (Total, this make and model), 5000 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CHRISTEN INDUSTRIES INC	**Registration:**	N88EW
Model/Series:	PITTS S 2B B	**Aircraft Category:**	Airplane
Year of Manufacture:	1985	**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	5073
Landing Gear Type:	Tailwheel	**Seats:**	
Date/Type of Last Inspection:	September 12, 2013 Annual	**Certified Max Gross Wt.:**	1700 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1330 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	AEIO-540-D4A5
Registered Owner:	LANCE MURRAY AVIATION LLC	**Rated Power:**	260 Horsepower
Operator:	LANCE MURRAY 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:	KOKB,28 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	17:52 Local	**Direction from Accident Site:**	239°
Lowest Cloud Condition:	Clear	**Visibility**	8 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	23°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Carlsbad, CA (CRQ)	**Type of Flight Plan Filed:**	None
Destination:	Carlsbad, CA (CRQ)	**Type of Clearance:**	VFR
Departure Time:	10:47 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	OCEANSIDE MUNI OKB	**Runway Surface Type:**	Asphalt
Airport Elevation:	28 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	2712 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

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:**	33.221389,-117.344169(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Patrick Tierney; FAA FSDO; San Diego, CA
Original Publish Date:	February 11, 2015
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=89805