Aviation Investigation Final Report

Location:	Wahiawa, Hawaii	**Accident Number:**	WPR13LA389
Date & Time:	August 27, 2013, 17:08 Local	**Registration:**	N413JJ
Aircraft:	Champion 8KCAB	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, shortly after he completed an aerobatic maneuver and while the airplane was in cruise flight about 4,000 ft above ground level, the engine lost power. The pilot initiated a turn back toward the nearest airport. When he realized that the airplane would be unable to reach the airport, he initiated a forced landing in a field. During the landing roll, the airplane nosed over and then came to rest inverted. Postaccident examination of the airplane the following day revealed that there was fuel in the header tank, but the quantity of fuel in the main tanks could not be determined because the airplane was inverted. Several days after the accident and during the airplane recovery, a small amount of fuel was observed in each main tank. It could not be determined if fuel had leaked from the tanks while the airplane was inverted. A postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The engine was test run at various power settings with no anomalies noted.

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 during cruise flight for reasons that could not be determined because postaccident examination of the engine and airframe did not reveal any anomalies that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing
Landing-landing roll	Nose over/nose down

On August 27, 2013, about 1708 Hawaiian standard time, an American Champion, 8KCAB, N413JJ, experienced a forced landing following a reported loss of engine power, near the Wheeler Army Airfield (PHHI) Wahiawa, Hawaii. The airplane was registered to J3 Engineering LLC, and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The commercial pilot sustained minor injuries and the passenger was seriously injured. The airplane sustained substantial damage to the wings, fuselage, and vertical stabilizer during the impact sequence. Visual meteorological conditions prevailed and no flight plan had been filed for the personal flight. The local flight originated at Honolulu International Airport, Honolulu, Hawaii, about 1655.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge, the pilot reported that the engine lost power about 30 seconds after completing an Immelmann acrobatic maneuver, while in straight and level flight, about 4,000 feet above ground level. The pilot stated that the airplane did not exceed the 2 minute inverted flight limitation. Despite repeated attempts, the pilot was unable to restart the engine. The pilot requested to land at PHHI. While on approach, the pilot realized that the airplane would not be able to make the runway, and he turned right, into a clearing. During the landing roll, the airplane nosed over and came to rest inverted, in a field about 1 mile from PHHI.

Postaccident examination of the airplane by a Federal Aviation Administration (FAA) inspector the following day revealed that no pre-impact anomalies with the airframe were observed. Continuity from the cockpit engine controls to the engine was established. The engine visually appeared to be intact and undamaged. No fuel was observed leaking from the airplane, and there was no evidence of fuel causing discoloration on the ground. According to the FAA inspector, the fuel header tank had about 3/4 of a gallon of fuel (half full). The main tanks fuel quantity levels were unable to be determined since the airplane was inverted.

Several days later, the airplane was recovered to a local storage facility for further examination. An FAA inspector observing the recovery reported that a small amount of fuel was visible in each main fuel tank, and the tanks were intact, once the airplane was turned right side up, and prior to transport of the wreckage. The inspector stated about 1-2 gallons of fuel was observed in one main tank, and a small amount in the other. However, it could not be ascertained if fuel had leaked from the airplane while it was inverted.

The airplane is equipped with two main tanks and a header tank totaling 40 gallons of fuel, of which 39 gallons is specified as usable. The fuel selector valve has two positions, on and off. According to The

Pilot Operating Handbook, a limited amount of fuel is provided while inverted, by a 1.5 gallon header tank. The outlet from the header fuel tank consists of a standpipe located at the center of the tank, which allows for half of the tank capacity to be used while in the inverted position.

Examination of the engine and airframe by a certified airframe and powerplant mechanic, under the supervision of an FAA inspector, reported that a quart or two of fuel was drained from each main tank, while the wings were stored in a horizontal position/leading edge down position. The gasolator fuel was clear and the screen was clean. No evidence of any internal damage to the engine or accessories was observed. A propeller was installed to facilitate the engine run due to impact damage of the propeller that was installed during the time of the accident. The engine was subsequently test run. The engine functioned normally throughout a various range of power settings. During the test run, fuel was provided through a line secured onto the inlet of the electric driven fuel pump. The certified mechanic stated that the engine started up right away and ran smooth once a fuel source was established, and that he observed no engine anomalies.

A multi-functional display unit was removed from the airplane and shipped to the NTSB Recorders laboratory for data download. Review of the data revealed that the accident's flight data was unreliable and did not provide any accurate information.

Review of the airplane's maintenance records revealed that the engine and airframe underwent their most recent 100-hour inspection on September 14, 2012, at an engine total time since new of 778 hours and airframe total time of 778 hours.

A review of the pilot's fuel logs in comparison to flight times and refueling intervals was accomplished. One potential error was observed on July 12, 2013, where the standard parameter of flight time was not used in the calculation (airplane tachometer time was used instead) which resulted in 0.3 gallons of fuel not appropriately accounted for. The airplane flew 2.9 flight hours since its last refueling on Aug 24, 2013. A fuel purchase invoice of the airplane's last refueling, showed 15.2 gallons of fuel was purchased and according to the pilot's fuel logs, a total of 30.4 gallons of fuel, remained in the airplane at that time. The pilot's fuel logs used 7.38 gallons per hour as the airplane's average fuel burn. The airplane manufacturer's Pilot Operating Handbook, cruise performance at 5,000 feet mean sea level, showed that the fuel flow ranged between 7.6 to 12.0 gallons per hour used, depending on the engine's revolutions per minute (rpm) and manifold pressure settings.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	68
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 18, 2013
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	January 14, 2012
Flight Time:	(Estimated) 2160.6 hours (Total, all aircraft), 157.3 hours (Total, this make and model), 1946 hours (Pilot In Command, all aircraft), 63 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 0.6 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	3-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Champion	**Registration:**	N413JJ
Model/Series:	8KCAB	**Aircraft Category:**	Airplane
Year of Manufacture:	2009	**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	1092-2009
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	September 14, 2014 Annual	**Certified Max Gross Wt.:**	1950 lbs
Time Since Last Inspection:	62 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	840 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	AEIO 360 41B
Registered Owner:	On file	**Rated Power:**	180 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:	PHHI,843 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	16:58 Local	**Direction from Accident Site:**	210°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	28°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Honolulu, HI (HNL)	**Type of Flight Plan Filed:**	None
Destination:	Honolulu, HI (HNL)	**Type of Clearance:**	VFR
Departure Time:	16:55 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Wheeler Army Airfield PHHI	**Runway Surface Type:**	Asphalt
Airport Elevation:	843 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	06	**IFR Approach:**	None
Runway Length/Width:	6507 ft / 294 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	21.500316,-158.01921(est)

Administrative Information

Investigator In Charge (IIC):	Nixon, Albert
Additional Participating Persons:	Donald G Andera; Federal Aviation Administration; Honolulu, HI John Butler; Lycoming Engines; Williamsport, PA
Original Publish Date:	March 17, 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=87898