



Aviation Investigation Final Report

Location:	Deadwood, California	Accident Number:	WPR18LA233
Date & Time:	August 20, 2018, 16:30 Local	Registration:	N14CK
Aircraft:	Blue Oak LLC. CCK-1865	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After completing routine maintenance on the experimental, amateur-built airplane, the private pilot decided to conduct a test flight near the departure airport. He completed a preflight inspection, a ground engine run, and taxi checks, which were normal; he noted that about 12 gallons of fuel was onboard the airplane. About 10 minutes after departure, he chose to extend the flight, as he did not observe any anomalies with the airplane. After an uneventful period of flight, the airplane was about 500 ft above ground level over mountain ridge tops when the engine lost partial power. The pilot maintained level flight and maneuvered the airplane toward more favorable terrain before the engine lost total power. Subsequently, the pilot performed a forced landing in a small clearing within heavily wooded mountainous terrain. During the landing roll, the airplane struck a tree and came to rest upright.

Postaccident examination of the airplane revealed no evidence of preexisting mechanical malfunctions or failures with the engine or fuel system, including the fuel quantity sight gauges, that would have precluded normal operation. The pilot reported that, after the accident, he noticed that the left-wing fuel cap was not fully secured. Wreckage recovery company personnel indicated that the right-wing fuel tank was void of fuel, and the left-wing fuel tank contained about 1/2 gallon of fuel. Review of a photograph provided by the wreckage recovery company taken 10 days after the accident revealed a small amount of residue and discoloration directly aft of the left-wing fuel filler neck, extending to the trailing edge of the fuel tank cover. It is likely that fuel vented through the loose fuel cap in flight, which reduced fuel quantity and led to the subsequent loss of engine power. Further, the pilot failed to adequately monitor the fuel quantity sight gauges while in flight.

Probable Cause and Findings

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

A loss of engine power due to fuel exhaustion and the pilot's failure to ensure that the left-wing fuel cap was secure before flight. Contributing to the accident was the pilot's failure to monitor fuel levels while in flight.

Findings

Personnel issues	Use of equip/system - Pilot
Aircraft	Fuel - Fluid management
Aircraft	Fuel - Fluid level
Personnel issues	Monitoring equip/instruments - Pilot
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

History of Flight

Maneuvering	Loss of engine power (partial)
Maneuvering	Loss of engine power (total) (Defining event)
Maneuvering	Fuel exhaustion
Landing-landing roll	Off-field or emergency landing
Landing-landing roll	Collision with terr/obj (non-CFIT)

On August 20, 2018, about 1630 Pacific daylight time, an experimental amateur built Blue Oak LLC CCK-1865 airplane, N14CK, impacted trees during an off airport forced landing near Deadwood, California. The private pilot was not injured, and the airplane sustained substantial damage to the left and right wings. The airplane was registered to Blue Oak LLC and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal flight. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight, which originated from Columbia Airport, Columbia, California, about 1600.

The pilot reported that prior to the accident flight, he had completed routine maintenance that spanned a few days that he finished about midafternoon on the day of the accident. The pilot decided to make a local test flight and noted that he had a total of about 12 gallons of fuel, as indicated by the fuel sight gauges. Following a preflight inspection, he conducted a ground engine run, and taxi checks, which were normal. After takeoff, he remained near the departure airport for about 10 minutes, and decided to lengthen his flight as he did not observe any anomalies

During the uneventful flight, he was about 500 ft above ground level over mountain ridge tops when the engine lost partial power. The pilot said that he was able to maintain level flight and maneuver toward more favorable terrain before the engine lost total power. Subsequently, the pilot initiated a forced landing in a small clearing within heavily wooded mountainous terrain. During the landing roll, the airplane struck a tree and came to rest upright. The pilot added that following the accident, he noticed that the left wing fuel tank cap was not secured.

The airplane was recovered to a secure location for further examination. Recovery company personnel reported that prior to disassembly of the airplane to facilitate removal of the wreckage, the right wing fuel tank contained no fuel, and the left wing fuel tank had about one-half gallon of fuel in it. Review of a photo furnished by the wreckage recovery company revealed that 10 days following the accident, a slight amount of residue / discoloration in trail of the left wing fuel tank filler neck, and extended to the trailing edge of the fuel tank cover.

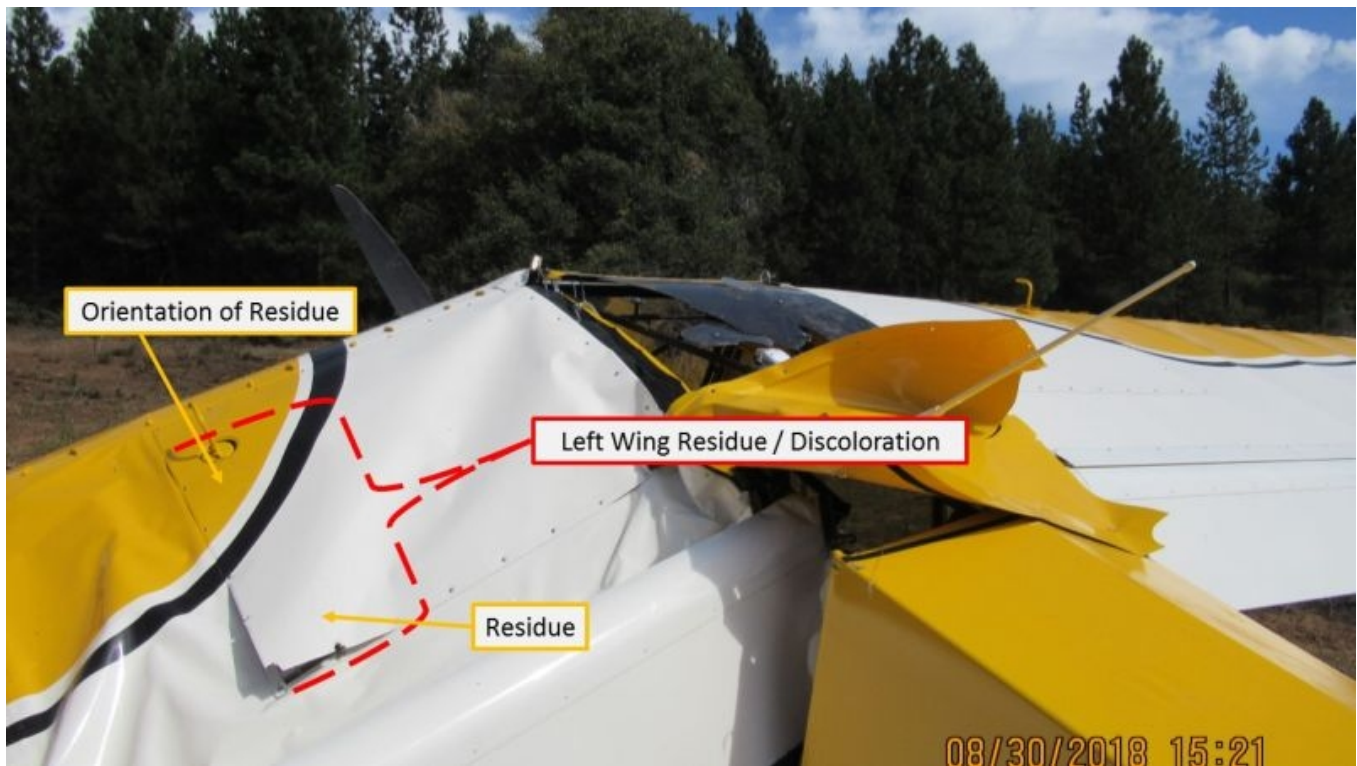


Photo 1: View of the left wing fuel tank, noting the slight discoloration in trail of the left fuel tank filler neck. Courtesy of Plain Parts.

The airplane was equipped with two 20-gallon wing fuel tanks, which gravity flowed to a fuel selector valve. The fuel selector valve had 4 selector positions, left, both, right, and off.

Examination of the recovered wreckage by the National Transportation Safety Board investigator-in-charge revealed that both wings were removed to facilitate wreckage recovery. The LyCon Exp IO-340-EXP engine, serial number L-54836-15E, remained attached to the airframe via its mounts. Throttle and mixture control continuity was established from the cockpit controls to the engine. All oil and fuel lines remained secure to their respective fittings. The top spark plugs were removed and exhibited normal operational signatures. All 4 fuel injector nozzles were removed and found to be free of debris.

The propeller was rotated by hand and rotational continuity was established throughout the engine and valve train. Thumb compression and suction was obtained on all four cylinders. The electronic magnetos produced spark on all eight ignition leads when the propeller was rotated by hand and when battery power was applied to the airframe.

The fuel lines from the fuel flow divider to the nozzles were free of debris. The fuel flow divider spring, and internal diaphragm were intact and no debris was observed. The fuel flow transducer was found free of debris. The fuel servo was intact and undamaged. The throttle plate was intact and undamaged. The fuel filter was free of debris. The fuel servo internal diaphragms were intact and undamaged. The gascolator screen was free of debris. A slight amount of debris was noted within the gascolator bowl along with residual fuel. The fuel pump switch was turned on and the fuel pump operated normally.

During removal of all of the fuel lines installed on the engine, residual fuel within the airframe fuel lines, and gascolator, a total of about 6 ounces of fuel was recovered.

The left and right wing fuel tanks were found intact and undamaged. One of the two fuel caps were located within the recovered wreckage, and the vent was free of debris and obstructions. The other fuel cap was not located. The clear tube sight gauges for each wing were intact and found free of debris.

Pilot Information

Certificate:	Private	Age:	60, Male
Airplane Rating(s):	Single-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):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	June 22, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	June 28, 2017
Flight Time:	2443 hours (Total, all aircraft), 217 hours (Total, this make and model), 2406 hours (Pilot In Command, all aircraft), 77 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Blue Oak LLC.	Registration:	N14CK
Model/Series:	CCK-1865	Aircraft Category:	Airplane
Year of Manufacture:	2017	Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	CCK-1865-0077
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	May 1, 2018 Condition	Certified Max Gross Wt.:	1865 lbs
Time Since Last Inspection:	90 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	217 Hrs as of last inspection	Engine Manufacturer:	LyCon
ELT:	C126 installed, activated, aided in locating accident	Engine Model/Series:	IO-340-EXP
Registered Owner:		Rated Power:	170 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:	KO22,2120 ft msl	Distance from Accident Site:	18 Nautical Miles
Observation Time:	23:35 Local	Direction from Accident Site:	274°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.89 inches Hg	Temperature/Dew Point:	35°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Columbia, CA (O22)	Type of Flight Plan Filed:	None
Destination:	Columbia, CA (O22)	Type of Clearance:	None
Departure Time:	16:00 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	38.010276,-120.031112(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Troy Wise; Federal Aviation Administration; Fresno, CA
Original Publish Date:	September 27, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98121

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).