# Aviation Investigation Final Report

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| **Location:** | Hyrum, Utah | **Accident Number:** | WPR18LA199 |
| **Date & Time:** | July 19, 2018, 09:50 Local | **Registration:** | N70DD |
| **Aircraft:** | Cub Crafters CC19 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Fuel exhaustion | **Injuries:** | 1 Serious |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The airline transport pilot was relocating the airplane to the owner's private ranch. The pilot stated that, before the flight, he ordered fuel for the airplane; however, when the fuel truck arrived, he checked the fuel levels using the fuel quantity sight gauges inside the airplane and "realized it was full," so he declined to have the airplane refueled. The pilot stated that he did not visually verify the fuel levels in each fuel tank or use a dipstick. The pilot added that, before the flight, he was dealing with a malfunctioning hangar door when he received a telephone call from work. After the call ended, he conducted his preflight inspection of the airplane and again attempted to close the hangar door. When the pilot attempted to start the engine, the battery was dead, so he charged it, started the engine, and then took off.

About 45 minutes after departure, during cruise flight over mountainous terrain, the engine began to lose power. As the pilot turned the electric fuel pump on, he noticed a slight increase in power; however, shortly thereafter, the engine lost all power. The pilot initiated an off-airport landing to a nearby open area; however, when he realized that the airplane would be unable to reach it, he maneuvered toward another suitable landing area. During the landing, the airplane impacted trees and terrain before it came to rest upright, which resulted in substantial damage to the right wing and fuselage.

First responders and wreckage recovery company personnel independently confirmed that no fuel was recovered from the wing tanks. Recovery personnel also reported that there was no fuel in the engine inlet fuel line during disassembly. Postaccident examination of the airplane revealed no evidence of any preexisting mechanical malfunctions or failures with the engine or fuel system, including the fuel quantity sight gauges, that would have precluded normal operation.

It is possible that, due to the distractions that the pilot reported experiencing while preparing for the flight, he did not correctly read the fuel quantity sight gauges during the preflight inspection. It is likely that the pilot departed with insufficient fuel onboard to complete the flight, which led to a loss of engine power due to fuel exhaustion.

## Probable Cause and Findings

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

The pilot's improper verification of the fuel quantity during the preflight inspection, which resulted in fuel exhaustion and a subsequent loss of engine power.Contributing to the accident was the pilot's distraction due to a malfunctioning hangar door and a telephone call while preparing for the flight.

### Findings

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| **Aircraft** | Fuel - Incorrect use/operation |
| **Personnel issues** | Preflight inspection - Pilot |
| **Environmental issues** | (general) - Contributed to outcome |
| **Environmental issues** | Tree(s) - Contributed to outcome |

# Factual Information

## History of Flight

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| **Enroute-cruise** | Fuel exhaustion (Defining event) |
| **Enroute-cruise** | Loss of engine power (total) |
| **Enroute** | Attempted remediation/recovery |
| **Enroute-cruise** | Off-field or emergency landing |
| **Enroute-cruise** | Collision with terr/obj (non-CFIT) |

On July 19, 2018, about 0950 mountain daylight time, a Cub Crafters Inc. CC19-180 airplane, N70DD, impacted terrain during a forced landing following a loss of engine power near Hyrum, Utah. The airline transport pilot sustained serious injuries, and the airplane sustained substantial damage to both wings and fuselage. The airplane was registered to a private individual and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a personal fight. Visual meteorological conditions prevailed, and no flight plan was filed for the cross-country flight. The flight originated from Ogden Hinkley Airport (OGD), Ogden, Utah, about 0905, with an intended destination of Pinedale, Wyoming.

The owner of the airplane reported that he frequently hired the accident pilot to fly the airplane to various locations. About two weeks prior to the accident, he had the pilot fly the airplane from Thermal, California to Ogden. The owner stated that the purpose of the accident flight was to relocate the airplane to his private ranch near Pinedale.

The pilot reported that on the morning of the accident, he met a friend at the airport for their intended flight of two airplanes to Pinedale. The pilot called CB Aviation, a local fixed base operator (FBO) for fuel, and while opening the hangar door to pull the accident airplane out, a cable snapped, and the hangar door stopped in an intermediate position. The pilot said he was able to get the airplane out, and when the fuel truck arrived, the driver queried him about how much fuel he would need. The pilot stated that he checked the fuel site quantity gauge and "realized it was full." He added that he did not visually inspect the fuel tanks nor did he use a dipstick. The fuel truck driver proceeded to top off the other airplane with fuel, and the pilot further acknowledged that he did not need fuel for the accident airplane. The pilot further stated that he began to focus on the hangar door, until he had received a phone call from work. After he had finished his telephone conversation, he conducted his preflight inspection of the accident airplane and attempted to close the hangar door.

When the pilot attempted to start the engine on the accident airplane, he observed that the battery was dead. After completing a quick charge of the battery and securing the aft battery compartment, he started the engine, and then taxied the airplane for departure. After he completed the before takeoff checklist, the pilot initiated a takeoff on runway 3, and established visual contact with his friend, who had departed previously. The pilot stated that he was in trail of his friend and maintained visual site of him while communicating on a predetermined radio frequency.

About 45 minutes later, during cruise flight over mountainous terrain, the engine began to lose power. The pilot radioed to his friend that he had lost engine power. As the pilot turned the electric fuel pump on, he noticed a slight increase in power, however, the engine lost all power shortly afterward. The pilot initiated an off-airport landing to a nearby opening, however, when he realized that he was unable to make it, he maneuvered toward another area suitable for landing. Subsequently, the airplane impacted trees and terrain before it came to rest upright.

Local law enforcement reported that the airplane had sustained damage to the right wing and fuselage. They did not observe fuel within either fuel tank at the accident site. Recovery company personnel reported that no fuel was recovered from the airframe wing tanks, nor was any fuel observed in the engine inlet fuel line during disassembly and subsequent transport of the airplane. The wreckage of the airplane was recovered to a secure location for further examination.

A representative from CB Aviation, the pilot's primary fuel source at OGD, reported that they had not refueled the accident airplane since November 2017. Additionally, no records of refueling the accident airplane were located at the remaining FBO's located at OGD.

Examination of the recovered wreckage by the National Transportation Safety Board investigator-in-charge revealed that the engine was separated from the airframe to facilitate wreckage recovery. The top spark plugs were removed and exhibited signatures consistent with normal operation. The left and right magnetos were removed. When the magneto drive shafts were rotated, spark was produced on all four posts of each magneto. The engine driven fuel pump was removed and disassembled. The internal components of the fuel pump were unremarkable. The propeller was rotated by hand and thumb compression and suction was obtained on all four cylinders in proper firing order. Equal movement of all intake and exhaust rocker arms was observed. The induction system and exhaust system were impact damaged and free of restrictions. The carburetor was removed, inspected, and disassembled. The throttle and mixture arms moved stop to stop freely by hand. The fuel screen was free of debris. The internal floats were intact, no liquid was observed within the float bowl, and the needle valve and seat were unremarkable.

The left and right wing fuel sight gauge tubes and ports were free of debris. Air was applied to both left and right wing fuel outlet fittings and air expelled from the engine inlet fuel line. No blockages were noted throughout any of the left and right wing fuel vents or fuel lines. In addition, the left and right fuel tanks were intact and not breached. No evidence of any preexisting mechanical anomalies were revealed that would have precluded normal operation.

## Pilot Information

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| **Certificate:** | Airline transport; Flight engineer | **Age:** | 40,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Front |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | Lap only |
| **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 1 Without waivers/limitations | **Last FAA Medical Exam:** | July 10, 2018 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | March 15, 2018 |
| **Flight Time:** | (Estimated) 3800 hours (Total, all aircraft), 30 hours (Total, this make and model) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Cub Crafters | **Registration:** | N70DD |
| **Model/Series:** | CC19 180 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 2017 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | CC19-0026 |
| **Landing Gear Type:** | Tailwheel | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | Annual | **Certified Max Gross Wt.:** | |
| **Time Since Last Inspection:** | | **Engines:** | Reciprocating |
| **Airframe Total Time:** | | **Engine Manufacturer:** | Lycoming |
| **ELT:** | C126 installed, activated, did not aid in locating accident | **Engine Model/Series:** | O-360 |
| **Registered Owner:** | | **Rated Power:** | 180 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:** | KLGU,4454 ft msl | **Distance from Accident Site:** | 18 Nautical Miles |
| **Observation Time:** | 15:51 Local | **Direction from Accident Site:** | 310° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30.15 inches Hg | **Temperature/Dew Point:** | 23°C / 8°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Ogden, UT (OGD ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Pinedale, WY | **Type of Clearance:** | None |
| **Departure Time:** | 09:05 Local | **Type of Airspace:** | Class G |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Serious | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Serious | **Latitude, Longitude:** | 41.596111,-111.552223(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Cawthra, Joshua |
| **Additional Participating Persons:** | Kevin Harvey; Federal Aviation Administration; Salt Lake City, UT |
| **Original Publish Date:** | April 30, 2019 |
| **Note:** | The NTSB did not travel to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=97836 |

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.