



# Aviation Investigation Final Report

<b>Location:</b>	Ogden, Utah	<b>Accident Number:</b>	WPR18LA102
<b>Date &amp; Time:</b>	March 5, 2018, 14:30 Local	<b>Registration:</b>	N669WH
<b>Aircraft:</b>	MACDONALD CRAIG MAC CUB	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (partial)	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot and pilot rated passenger were conducting a local flight when the engine began to run roughly, and partial loss of engine power followed. The airplane was unable to maintain altitude, and the pilot made a forced landing onto a muddy road. During the landing roll, the airplane sunk in the mud, nosed over, and came to rest inverted, causing substantial damage to the left wing and vertical stabilizer. An engine examination and test run were performed, which revealed no preaccident mechanical failures or malfunctions that would have precluded normal operation.

The nearest weather reporting facility, located about 6 nautical miles from the accident site, reported a temperature of 35.6°F and a dew point of 19.4°F, which was in the range of atmosphere conditions that are conducive to carburetor icing at glide and cruise power settings. The pilot reported that the carburetor heat was not activated at the time of the partial loss of engine power.

The pilot also reported that he was in the rear airplane seat. Although the pilot had access to both sets of flight controls, the rear seat compartment was not equipped with a carburetor heat control handle. Engine power would likely have been restored if the carburetor heat had been engaged.

## Probable Cause and Findings

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

The pilot's failure to use carburetor heat during the flight, which resulted in a partial loss of engine power due to carburetor icing.

## Findings

<b>Personnel issues</b>	Use of equip/system - Pilot
<b>Environmental issues</b>	Conducive to carburetor icing - Effect on equipment
<b>Aircraft</b>	Fuel control/carburetor - Incorrect use/operation

# Factual Information

## History of Flight

Enroute-cruise	Loss of engine power (partial) (Defining event)
Landing-landing roll	Nose over/nose down

On March 5, 2018, about 1430 mountain standard time, an experimental MacDonald Craig Mac Cub airplane, N669WH, was involved in an accident near Ogden, Utah. The pilot and pilot-rated passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that, while the airplane was maneuvering over a marshland, the engine began to run roughly, and a partial loss of power followed. Because the airplane was unable to maintain altitude, the pilot initiated a forced landing onto a 10-ft-wide muddy road. During the landing roll, the airplane sunk in the mud, nosed over, and came to rest inverted. The left wing and vertical stabilizer were substantially damaged.

The pilot reported that the carburetor heat control was not activated at the time of the partial loss of engine power. The pilot was in the rear airplane seat, and the pilot-rated passenger was in the front seat. Although the pilot had access to both sets of flight controls, the rear seat compartment was not equipped with a carburetor heat control handle.

The Ogden-Hinckley Airport (OGD) automated weather observing station was located about 6 nautical miles northwest of the accident site. The 1353 observation reported that the temperature was 35.6°F and that the dew point was 19.4°F.

An engine examination and test run were performed. The results revealed no preaccident mechanical failures or malfunctions that would have precluded normal operation.

The Federal Aviation Administration Special Airworthiness Information Bulletin CE-09-35, Carburetor Icing Prevention, stated the following:

*Pilots should be aware that carburetor icing doesn't just occur in freezing conditions, it can occur at temperatures well above freezing temperatures when there is visible moisture or high humidity. Icing can occur in the carburetor at temperatures above freezing because vaporization of fuel, combined with the expansion of air as it flows through the carburetor, (Venturi Effect) causes sudden cooling, sometimes by a significant amount within a fraction of a second. Carburetor ice can be detected by a drop in rpm in fixed pitch propeller airplanes and a drop in manifold pressure in constant speed propeller airplanes. In both types, usually there will be a roughness in engine operation.*

The special airworthiness information bulletin included a chart that showed the probability of carburetor icing for various temperature and relative humidity conditions. According to that

chart, the weather conditions at the time of the accident were conducive to carburetor icing at glide and cruise power.

### Pilot Information

<b>Certificate:</b>	Airline transport; Commercial; Flight instructor	<b>Age:</b>	37, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Rear
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	November 16, 2017
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	April 15, 2016
<b>Flight Time:</b>	3200 hours (Total, all aircraft), 16 hours (Total, this make and model), 2611 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

### Pilot-rated passenger Information

<b>Certificate:</b>	Private	<b>Age:</b>	Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Front
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3	<b>Last FAA Medical Exam:</b>	September 17, 2018
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	MACDONALD CRAIG	<b>Registration:</b>	N669WH
<b>Model/Series:</b>	MAC CUB NO SERIES	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2005	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	001
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	October 6, 2017 Condition	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>	100 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	290 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	O-360-A4G
<b>Registered Owner:</b>		<b>Rated Power:</b>	195 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	OGD,4439 ft msl	<b>Distance from Accident Site:</b>	6 Nautical Miles
<b>Observation Time:</b>	13:53 Local	<b>Direction from Accident Site:</b>	39°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 4100 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	8 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	300°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.3 inches Hg	<b>Temperature/Dew Point:</b>	2°C / -7°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Ogden, UT	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Ogden, UT	<b>Type of Clearance:</b>	VFR flight following
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	SKYPARK BTF	<b>Runway Surface Type:</b>	Dirt
<b>Airport Elevation:</b>	4234 ft msl	<b>Runway Surface Condition:</b>	Rough;Soft;Wet
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	41.121387,-112.08833(est)

## Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye		
Additional Participating Persons:	Jon A Hanson; Federal Aviation Administration; Salt Lake City, UT		
Original Publish Date:	March 4, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	<a href="https://data.nts.gov/Docket?ProjectID=96843">https://data.nts.gov/Docket?ProjectID=96843</a>		

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](#).