



National Transportation Safety Board Aviation Accident Final Report

Location:	Hardwick, VT	Accident Number:	ERA13LA397
Date & Time:	09/01/2013, 1030 EDT	Registration:	N31915
Aircraft:	AERONCA 65CA	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	2 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported that a preflight inspection and engine run-up revealed no anomalies. Shortly after the airplane lifted off the runway, the engine began “misfiring” and then experienced a total loss of power. The pilot maneuvered the airplane straight ahead, and it subsequently impacted a tree, which resulted in substantial damage to the forward fuselage, engine firewall, and left wing. Although the pilot and passenger were both seriously injured during the accident, both of their seat belts remained intact and firmly anchored to their respective seats; the belts’ latching mechanisms operated normally.

The engine sustained extensive impact damage, and the crankshaft could not be rotated by hand during postaccident examination. Several of the spark plugs were loose and could be removed by hand; it could not be determined whether the spark plugs had been improperly installed during the airplane’s most recent inspection or sometime thereafter. In addition, the spark plugs exhibited black sooty deposits, which is indicative of the engine operating with an excessively rich fuel/air mixture. Examination of the carburetor revealed that the float needle would not seat properly and that the float level specified by the manufacturer could not be maintained; these conditions would be expected to result in an excessively rich fuel/air mixture at high engine power settings. Therefore, based on the evidence, it is likely that the engine was operating with an excessively rich fuel/air mixture, which resulted in the carburetor flooding and the subsequent loss of engine power. Although the engine maintenance logbooks documented that an overhauled carburetor had recently been installed on the airplane and that a subsequent test run was successfully performed, they did not document when or by whom the carburetor overhaul was performed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The improper maintenance of the carburetor, which resulted in a total loss of engine power due to carburetor flooding.

Findings

Aircraft	Fuel control/carburetor - Malfunction (Cause) Fuel control/carburetor - Incorrect service/maintenance (Cause)
Personnel issues	Repair - Maintenance personnel (Cause) Aircraft/maintenance logs - Pilot
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

On September 1, 2013, approximately 1030 eastern daylight time, an Aeronca 65CA, N31915, was substantially damaged during a forced landing following a total loss of engine power after takeoff from a private airfield in Hardwick, Vermont. The certificated private pilot and passenger were seriously injured. Visual meteorological conditions prevailed, and no flight plan was filed for the flight. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The pilot reported that a preflight inspection revealed no anomalies of the airplane. The airplane's fuel tank contained 6.5 gallons of fuel, and a fuel sample exhibited no contaminants. The pilot started the engine and observed no abnormal indications on the engine gauges. A subsequent engine run-up check also revealed no anomalies, and the pilot initiated the takeoff roll from the turf runway utilizing a short-field takeoff procedure. Shortly after the airplane lifted off the runway, the engine began "misfiring" and experienced a total loss of power. The pilot maneuvered the airplane straight ahead, and it subsequently impacted the base of a large tree, resulting in substantial damage to the forward fuselage, engine firewall, and left wing.

The pilot held a private pilot certificate with a rating for airplane single-engine land. His most recent Federal Aviation Administration (FAA) third-class medical certificate was issued August 2, 2013. The pilot reported 92.5 total hours of flight experience, of which 46.8 hours were in the accident airplane make and model.

The tailwheel-equipped airplane was manufactured in 1941, and was purchased by the pilot in September 2008. The airplane's most recent annual inspection was completed on May 6, 2013 at a total airframe time of 1533.56 hours and a total tachometer time of 215.36 hours. Review of maintenance logs showed that an overhauled carburetor, new mixture control cable, and new carburetor heat control cable were installed in the airplane on June 22, 2013, and a subsequent test run of the engine was performed with no anomalies noted. There was no documentation regarding when or by whom the carburetor overhaul was performed. At the time of the accident, the airplane had accumulated approximately 7.5 hours since its most recent annual inspection.

The 1054 weather observation at Morrisville-Stowe State Airport (MVL), Morrisville, Vermont, located about 13 nautical miles west of the accident site, included variable wind at 3 knots, 10 statute miles visibility, clear skies, temperature 25 degrees, dew point 17 degrees, and an altimeter setting of 29.90 inches of mercury.

Postaccident examination of the airplane by an FAA inspector revealed that the airplane impacted an approximate 3-foot diameter tree. An odor of fuel was present at the site. Continuity of the flight controls from the cockpit area to all control surfaces was confirmed. As a result of contact with the tree, the engine was significantly damaged, and the crankshaft could not be rotated by hand. Visual inspection of the cylinders revealed no anomalies. Both magnetos were removed, and rotation of their respective input drives produced spark at all terminal leads. The spark plugs were removed and exhibited black sooty deposits. Several of the spark plugs were loose and able to be removed by hand. The carburetor filter was removed, and was absent of debris. The front/pilot seat assembly separated from the airframe during impact, but the pilot and passenger seatbelt webbing remained intact, and both belts remained attached to their respective seat anchor points. Each of the belts' latching mechanisms operated normally.

The carburetor was removed from the engine, disassembled, and examined in detail. When vacuum was applied to the fuel inlet fitting, the float needle was observed to seat improperly, and the manufacturer's specified float level of 13/32" could not be maintained. Application of a 1/2 psi fuel pressure resulted in the carburetor bowl being filled, and the needle/float being unable to prevent an excessively rich mixture condition. The float was within the manufacturer's weight specification, and when immersed in water heated to 212 degrees F, revealed no evidence of leaks. The main jet, air bleed, and idle air tube orifices were absent of any obstructions and met the manufacturer's dimensional specifications.

The airplane was subject to FAA Airworthiness Directive (AD) 47-30-08, which required modification of the seat belt anchorage to prevent failure during a crash landing. Review of FAA airworthiness records revealed an Application for Airworthiness Certificate dated September 13, 1948, stating that the airplane conformed to all applicable airworthiness directives, including AD 47-30-08. Review of maintenance logs also revealed an entry dated April 23, 2009 which stated, "[complied with] AD 47-30-08 by welding seat as per AD seat mod." Examination of the accident airplane revealed "L"-shaped gussets welded onto the corners of the fore and aft seat tube support structure in accordance with the modification described by the AD.

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	59
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With Waivers/Limitations	Last Medical Exam:	03/23/2012
Occupational Pilot:	No	Last Flight Review or Equivalent:	08/02/2013
Flight Time:	92.5 hours (Total, all aircraft), 46.8 hours (Total, this make and model), 92.5 hours (Pilot In Command, all aircraft), 15.5 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	AERONCA	Registration:	N31915
Model/Series:	65CA	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	CA-11931
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	05/06/2013, Annual	Certified Max Gross Wt.:	1320 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	1534 Hours	Engine Manufacturer:	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	A&C65 SERIES
Registered Owner:	RING DAVID M	Rated Power:	65 hp
Operator:	RING DAVID M	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	MVL, 732 ft msl	Observation Time:	1054 EDT
Distance from Accident Site:	13 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	295°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	25° C / 17° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	3 knots, Variable	Visibility (RVR):	
Altimeter Setting:	29.9 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hardwick, VT (NONE)	Type of Flight Plan Filed:	None
Destination:	Morrisville, VT (KMVL)	Type of Clearance:	None
Departure Time:	1030 EDT	Type of Airspace:	Class G

Airport Information

Airport:	Private Strip (NONE)	Runway Surface Type:	Grass/turf
Airport Elevation:	250 ft	Runway Surface Condition:	Unknown
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced Landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious		

Administrative Information

Investigator In Charge (IIC):	Allison N Diaz	Adopted Date:	03/17/2015
Additional Participating Persons:	John Keefe; FAA/FSDO; Portland, ME		
Publish Date:	03/17/2015		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=87977		

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