



National Transportation Safety Board Aviation Accident Final Report

Location:	Cedar City, UT	Accident Number:	WPR11LA180
Date & Time:	04/01/2011, 1045 MDT	Registration:	N613HH
Aircraft:	William Wright Avid Flyer	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was on a local test flight after restoring the airplane and flew for about 1 hour, performing maneuvers and touch-and-go landings. He then returned to the airport and picked up another pilot for a familiarization flight. About 1/2 hour into the second flight, the engine sputtered and lost power. The pilot subsequently made an emergency landing on an airstrip, and after performing some troubleshooting, he determined that fuel was not getting from the header tank to the engine. The pilot was able to eventually get the fuel flowing again and ran the engine for about 30 minutes on the ground, followed by accomplishing a successful run up. The pilot then departed the airstrip. He reported that the engine ran well until about 200 feet above ground level. The engine then lost all power, and the pilot glided the airplane into 15-foot-tall trees. Postaccident examination of the engine revealed modifications to the exhaust, intake, ignition, and fuel systems that were not approved by the manufacturer. At the conclusion of the examination, it could not be determined if there was a specific malfunction or a combination of the multiple modifications that led to the loss of engine power. According to FAA Advisory Circular AC 20-27F, Certification and Operation of Amateur-Built Aircraft, "Amateur builders are free to develop their own designs or build from existing designs."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power during initial climb for reasons that could not be determined because postaccident examination did not reveal a specific anomaly that would have precluded normal operation.

Findings

Aircraft	Fuel system - Design
Personnel issues	Modification/alteration - Owner/builder
Environmental issues	Tree(s) - Not specified
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

HISTORY OF FLIGHT

On April 1, 2011, about 1045 mountain daylight time, a William Wright Avid Flyer, N613HH, collided with trees during an off airport forced landing following a loss of engine power on takeoff from a strip near Cedar City, Utah. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The private pilot was not injured; the airplane sustained substantial damage to the wings from impact forces. The local personal flight was departing with a planned destination of Cedar City. Visual meteorological conditions prevailed, and no flight plan had been filed.

The pilot stated that he departed Cedar City on a local test flight after restoring the airplane. He flew for approximately 1 hour, performing both maneuvers and touch-and-go takeoffs and landings. He returned to the airport, and picked up another pilot for a familiarization flight.

About 1/2 hour into the second flight, the engine sputtered and lost power. The pilot made an emergency landing on a landing strip for radio remote controlled airplanes. He performed some troubleshooting, and determined that fuel was not getting from the header tank to the engine. He was successful in getting the fuel flowing again. He ran the engine for about 30 minutes on the ground, and performed a successful run up. The pilot decided to leave his passenger at the strip, and fly home alone. He planned to return by car to pick up the passenger.

The pilot departed the strip, and reported that the engine ran well until about 200 feet above ground level (agl). The engine then lost all power, and he glided the airplane into 15-foot-tall trees. He was wearing a three-point harness; the full extent of his injuries included bruises along the strap lines.

WRECKAGE EXAMINATION

On April 19, 2011, inspectors from the Federal Aviation Administration (FAA) supervised examination of the airplane by personnel from Rotech Flight Safety, Inc., who were technical advisers to the Austrian accredited representative per International Civil Aviation Organization Annex 13. The complete Rotech report is part of the public docket; pertinent parts of the report follow.

During the visual inspection, the investigators noted modifications to the exhaust system for incorporation of cabin heat by shrouding the exhaust muffler, and ducting into the cabin. They also observed that the exhaust gas temperature (EGT) probes had been relocated from the factory recommended positions, and the previous holes plugged with pop rivets. The installation manual noted that EGT would give the most rapid response in the event of improper mixture, pre-ignition, or detonation.

The investigators observed an aftermarket mixture control installed on the engine, which also included modifications to the fuel and air intake systems. The Rotax installation manual stated that no modification should be made to the carburetor and air intake system without consulting Rotax. The system installed did not have their approval.

The engine had dual carburetors installed. Both carburetors had jets that were different from the stock jets with leaner fuel to air ratios than the stock jets. Both jets were different from each other. According to the Rotech representative, in order for the engine to run properly, both

carburetors must be synchronized to each other, and are required to have the exact same jetting.

The fuel filters were installed in the incorrect location on the fuel system. The installation manual called for the filters to be between the fuel pump and the carburetors. On the accident engine, they were installed between the fuel pump and the fuel tank.

The carburetor vent lines were improperly installed.

The fuel pump was installed improperly to the top of the engine. The installation manual stated to mount it in a cool place, not on the engine itself.

The spark plugs were nonstandard. The electrodes were excessively black and sooty, which the investigators noted was consistent with a rich fuel/air mixture. Examination of the ignition wires revealed that exposed bare wires had been spliced and soldered together, which had the potential of shorting. Solder was not an acceptable repair method, and the wire was in poor shape.

Improper gear oil had been used to lubricate the Rotary and water pump drive shaft rather than 2-stroke injection oil as specified by the manufacturer.

ADDITIONAL INFORMATION

According to FAA Advisory Circular AC 20-27F, Certification and Operation of Amateur-Built Aircraft, "Amateur builders are free to develop their own designs or build from existing designs. We do not approve these designs and it would be impractical to develop design standards for the wide variety of design configurations, created by designers, kit manufacturers, and amateur builders."

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing Controlled flight into terr/obj (CFIT)

Pilot Information

Certificate:	Private	Age:	63, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without Waivers/Limitations	Last Medical Exam:	10/07/2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	285 hours (Total, all aircraft), 6 hours (Total, this make and model), 215 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	William Wright	Registration:	N613HH
Model/Series:	Avid Flyer	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	613
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:		Certified Max Gross Wt.:	1150 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Rotax
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	582UL
Registered Owner:	Color Country Electronics	Rated Power:	66 hp
Operator:	Color Country Electronics	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KCDC, 5622 ft msl	Observation Time:	1053 MDT
Distance from Accident Site:	5 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	120°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	15°C / -1°C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	Calm	Visibility (RVR):	
Altimeter Setting:	30.14 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Cedar City, UT	Type of Flight Plan Filed:	None
Destination:	Cedar City, UT (CDC)	Type of Clearance:	None
Departure Time:	1045 MDT	Type of Airspace:	

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC): Howard D Plagens **Adopted Date:** 01/31/2013

Additional Participating Persons: Mark Rushton; FAA FSDO; Salt Lake City, UT

Publish Date: 01/31/2013

Investigation Docket: <http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=78733>

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