



Aviation Investigation Final Report

Location:	Burkesville, Kentucky	Accident Number:	NYC08LA251
Date & Time:	July 16, 2008, 19:15 Local	Registration:	N70694
Aircraft:	Holmes Arthur Orman Kitfox IV	Aircraft Damage:	Substantial
Defining Event:	Powerplant sys/comp malf/fail	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that while the airplane was in cruise flight, he heard a "loud bang" and the "engine stopped." He then aligned the airplane with a road to perform an off-airport emergency landing. While on short final, he identified powerlines which required him to trade airspeed for altitude. After clearing the powerlines, the airplane touched down hard on the road causing substantial damage to the fuselage. An external examination of the non-certificated engine revealed a hole in the front of the engine case as well as a crack in the No. 2 cylinder. Oil was found in the oil reservoir, and was measurable on the engine oil dipstick; however, installed on the engine was an oil filter that did not meet the engine manufacture's specifications. It did not properly fit the engine oil filter mount, and lacked critical features needed to ensure normal engine operation such as a bypass valve, pressure release of the bypass valve, an anti-drain back valve, and the proper amount of filter matting.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The total loss of engine power due to the installation of an engine oil filter that did not meet the engine manufacture's specifications.

Findings

Aircraft	Recip eng cyl section - Failure
Aircraft	Eng oil dist (airframe furn) - Incorrect service/maintenance
Personnel issues	Installation - Not specified

Factual Information

History of Flight

Enroute-cruise	Powerplant sys/comp malf/fail (Defining event)
Enroute-cruise	Loss of engine power (total)
Landing	Off-field or emergency landing
Landing	Hard landing
Landing	Landing gear collapse

On July 16, 2008, about 1915 central daylight time, a Holmes Arthur Orman, Kitfox IV, N70694, was substantially damaged during a forced landing on a roadway near Burkesville, Kentucky. The certificated private pilot was not injured. Day visual meteorological conditions prevailed, and no flight plan was filed. The local personal flight departed from a private grass field near Burkesville, Kentucky. The flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

During an interview with the Federal Aviation Administration (FAA) inspector, the pilot stated that while in cruise flight he heard a "loud bang, the "engine stopped," forcing him to make an off airport emergency landing. After seeing a paved roadway, he elected to land there. While on the final leg of the approach, he noticed power lines suspended across the roadway, he changed his approach angle in order to clear the top of the suspended lines. Once over the lines he descended to the roadway, landed "firm," bounced, and "landed hard" again causing substantial damage to the landing gear and fuselage which where buckled and splayed at their attachment points.

According to the Federal Aviation Administration, the pilot, age 51, held a private pilot certificate with ratings for single- and multi-engine land airplane. The pilot reported 500 hours of total flight experience, with 22 hours total flight experience in the accident airplane make and model.

The airplane, which was issued a Special Airworthiness Certificate on July 31, 1993, was powered by a Rotax 912 engine. At the time of the accident the airplane's tachometer indicated 751 hours of operation, and the latest annual inspection was completed on July 10, 2007. The engine hours were the same as the aircraft hours.

The wreckage was examined by a FAA inspector at the home of the pilot/owner. The inspector reported that there was a hole in the front of the engine case as well as a crack in the No 2 cylinder. Control continuity was confirmed on all control surfaces, oil was found in the oil reservoir, and was measurable on the engine oil dipstick.

The 1956 recorded weather observation at Wayne County Airport (EKQ), Monticello, Kentucky,

an airport about 30 nautical miles to the east of the accident location, included clear skies, calm winds, visibility 10 miles, temperature 28 degrees C, dew point 14 degrees C, and an altimeter setting of 30.17 inches of mercury.

The Rotax installation manual, Chapter 13.6, states that the longitudinal axis of the oil tank must be parallel to the longitudinal axis of the engine. The tolerated deviation of parallelism is 10 degrees. The oil tank must also be positioned vertically in such a way that the normal oil level is always between 0 and negative 15.7 inches with the crankshaft of the engine. The manual warns that higher locations of the oil tank might cause oil to trickle through clearances at bearings and into the crankcase during long periods of engine stoppage. If fitted too low, it might negatively affect the circulation of oil.

According to excerpts from the Rotax Maintenance Manual, chapter 5.3 "Oil filter replacement and inspection of the filter insert gives a caution: to ensure correct functioning of the oil circuit and the forced flow lubrication, use genuine ROTAX oil filter only. Only these filters will ensure correct pressure in the by-pass valve."

Photos taken of the accident airplane engine show a white filter that Rotax states "are a garden tractor filter." This type of filter lacks a bypass valve, the pressure release of the bypass valve, the anti-drain back valve, and the amount of filter matting. According to Rotax "the filter installed on this airplane did not fit the flange area of the pump."

Pilot Information

Certificate:	Private	Age:	51, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Unknown
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 FAA Medical Exam:	August 1, 2006
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	500 hours (Total, all aircraft), 22 hours (Total, this make and model), 30 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Holmes Arthur Orman	Registration:	N70694
Model/Series:	Kitfox IV	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental light sport (Special)	Serial Number:	1781
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:		Certified Max Gross Wt.:	1200 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Rotax
ELT:	Not installed	Engine Model/Series:	912
Registered Owner:	On file	Rated Power:	
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Dusk
Observation Facility, Elevation:	EKQ,963 ft msl	Distance from Accident Site:	29 Nautical Miles
Observation Time:	18:56 Local	Direction from Accident Site:	80°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.17 inches Hg	Temperature/Dew Point:	28°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Burkesville, KY (NONE)	Type of Flight Plan Filed:	None
Destination:	(NONE)	Type of Clearance:	None
Departure Time:		Type of Airspace:	

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:	36.773887,-85.371948(est)

Administrative Information

Investigator In Charge (IIC):	Etcher, Shawn
Additional Participating Persons:	Shannon Bengeyfield; FAA/FSDO; Louisville, KY
Original Publish Date:	November 9, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68458

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).