



Aviation Investigation Final Report

Location:	Bozeman, Montana	Accident Number:	WPR10LA003
Date & Time:	October 3, 2009, 09:48 Local	Registration:	N359JM
Aircraft:	MATESKON FISHER DAK	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 departing on a local flight when the engine lost power; the pilot force-landed the airplane in a field. Post accident examination of the engine showed that the bolts securing the crankshaft gear cluster to the crankshaft were sheared. The crankshaft gear cluster is geared to the camshaft gear and rotates as the engine operates. Examination of the bolts showed that all four bolts had sheared between the crankshaft gear cluster and the attach point to the crankshaft. Two bolt heads, including a portion of the bolts' lengths, were missing. The other portions of these bolts remained threaded to the crankshaft attach points. The two remaining bolt heads were still safety-wired and in place; however, they had sheared from the crankshaft. The lower threaded portions of all four bolts remained threaded at the crankshaft attach points. No pieces of the missing bolt heads or bolt portions were identified in the accessory case or the oil sump. Examination of the fracture surfaces on the threaded bolt portions showed that the surfaces of the sheared bolts with the missing heads appeared battered. The portions of the bolts still threaded in the crankshaft that belonged to the remaining bolt heads were not battered. The engine had not undergone a complete overhaul of the type that would have exposed the accessory gear section to inspection for over 35 years. According to Teledyne Continental Motors Service Instruction Letter 98-9A, the C-85 engine should be overhauled every 12 years or 1,800 hours.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to shearing of the crankshaft gear cluster bolts. Contributing to the accident was the lack of regular overhaul periods as recommended by the engine manufacturer.

Findings

Aircraft	Recip engine power section - Fatigue/wear/corrosion
Aircraft	(general) - Not serviced/maintained

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing

HISTORY OF FLIGHT

On October 3, 2009, at 0948 mountain daylight time, N359JM, a Mateskon Fisher Dakota Hawk, lost engine power during cruise and the pilot force-landed the airplane in a field approximately 5 miles southwest of Gallatin Field, Bozeman, Montana. During the landing, the right wing clipped a tree. The private pilot, who was also the registered owner of the airplane, operated it under the provisions of 14 Code of Federal Regulations Part 91. The pilot sustained minor injuries and the airplane was substantially damaged. Visual meteorological conditions prevailed and no flight plan was filed for the local area flight.

The pilot reported that he had departed Gallatin Field about 10 minutes prior to the power loss. The power loss was sudden. He attempted to restart the engine but was unsuccessful. During his approach to a field, the right wing clipped a tree.

AIRPLANE HISTORY

The pilot had built the airplane over a period of three years. It had accrued approximately 141.4 hours. The pilot indicated that the engine, a Teledyne Continental Motors C-85-12, had been installed on another airplane in the 1980s. The previous engine owner was going to install it on another airplane but did not do so and the engine had been placed into storage. The pilot then purchased the engine for his airplane. The pilot did note that recently he had the piston rings changed due to a higher than normal oil burn. The pilot did not have any other problems with the engine.

Review of the maintenance records for the engine showed that the last engine overhaul was a field overhaul that occurred on December 4, 1973. The engine was removed from another airplane in 1987, at 1085.8 hours since major overhaul, and 4,807.8 hours total time. It was in storage until the pilot/builder of the accident aircraft purchased it. The last top overhaul occurred on June 1, 2006. A typical top overhaul does not involve inspection of the accessory gear section.

TESTS AND RESEARCH

The engine was examined following the accident. The valve covers were removed and the propeller was rotated. No valve movement was evident. Investigators then removed the

magnetos and starter from the accessory case and noted that none of the accessory gears turned when the propeller was rotated. Further examination revealed that the crankshaft gear cluster had separated from the crankshaft.

The crankshaft gear cluster is geared to the camshaft gear and rotates as the engine operates. The crankshaft gear cluster is attached to the aft section of the crankshaft by four bolts. Examination of the bolts showed that all four bolts had sheared between the crankshaft gear cluster and the attach point to the crankshaft. Two bolt heads, including a portion of the bolts' lengths, were missing. The other portions of these bolts remained threaded in the crankshaft attach points. The two remaining bolt heads were still safety wired and in place; however, they had sheared from the crankshaft. The lower threaded portions of all four bolts remained threaded at the crankshaft attach points. No pieces of the missing bolt heads or bolt portions were identified in the accessory case or the oil sump.

Examination of the fracture surfaces on the threaded bolt portions showed that the surfaces of the sheared bolts with the missing heads appeared battered. The portions of the bolts still threaded in the crankshaft that belonged to the remaining bolt heads were not battered.

ADDITIONAL INFORMATION

According to TCM Service Instruction Letter 98-9A, the C-85 engine should be overhauled every 12 years or 1,800 hours.

Pilot Information

Certificate:	Private	Age:	57, Male
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:	Sport pilot	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	July 15, 2008
Flight Time:	193 hours (Total, all aircraft), 141 hours (Total, this make and model), 10 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MATESKON	Registration:	N359JM
Model/Series:	FISHER DAK	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	DH38
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	October 23, 2008 Condition	Certified Max Gross Wt.:	1150 lbs
Time Since Last Inspection:	25 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	141 Hrs at time of accident	Engine Manufacturer:	CONT MOTOR
ELT:	C91 installed, activated, did not aid in locating accident	Engine Model/Series:	C85 SERIES
Registered Owner:	On file	Rated Power:	85 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	BZN,4473 ft msl	Distance from Accident Site:	4 Nautical Miles
Observation Time:	09:56 Local	Direction from Accident Site:	200°
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:	29.9 inches Hg	Temperature/Dew Point:	6°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bozeman, MT (BZN)	Type of Flight Plan Filed:	None
Destination:	Bozeman, MT (BZN)	Type of Clearance:	VFR
Departure Time:	09:45 Local	Type of Airspace:	

Airport Information

Airport:	Gallatin Field BZN	Runway Surface Type:	
Airport Elevation:	4473 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	45.714721,-111.188331

Administrative Information

Investigator In Charge (IIC):	Dunks, Kristi
Additional Participating Persons:	Bryan Hanson; Federal Aviation Administration; Helena, MT
Original Publish Date:	April 19, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=74843

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