



National Transportation Safety Board Aviation Accident Final Report

Location:	Oshkosh, WI	Accident Number:	CEN14LA401
Date & Time:	08/01/2014, 1415 CDT	Registration:	CF-HEZ
Aircraft:	MOSQUITO XE	Aircraft Damage:	Substantial
Defining Event:	Part(s) separation from AC	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Just after takeoff, the experimental, amateur-built helicopter started to rotate and then impacted the ground in a level attitude, which resulted in substantial damage to the helicopter. Examination revealed that one tail rotor blade had separated from the tail rotor and gearbox assembly and that the blade had separated cleanly from the assembly; neither the collar nor the pins used to secure the blade were located. The pilot reported that he had been testing this tail rotor design for 4 years. A tension/torsion strap and two steel pins were used to retain the blade. The strap was not completely restricted from movement, and, over time, movement and wear resulted in the failure of the retaining assembly. The tail rotor assembly was a unique design and was not used in any other application.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the retaining assembly on the tail rotor blade, which resulted in the separation of the blade and the subsequent loss of helicopter control.

Findings

Aircraft	Tail rotor blade - Failure (Cause)
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Factual Information

On August 1, 2014, about 1415 central daylight time, a Mosquito XE amateur-built helicopter, Canadian-registered CF-HEZ was substantially damaged while maneuvering near Wittman Regional Airport (KOSH), Oshkosh, Wisconsin. The private pilot was not injured. Visual meteorological conditions prevailed for the flight. The helicopter was owned and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 without a flight plan. The local flight departed approximately 1410.

Just after takeoff, one tail rotor blade separated from the tail rotor and gearbox assembly. The helicopter started to rotate and impacted the ground in a level attitude, spreading both skids out horizontally. Both skids and the tail boom were substantially damaged.

According to the Federal Aviation Administration inspector who examined the helicopter, the tail rotor blade had separated cleanly from the assembly. Neither the collar nor the pins used to secure the blade were located. The inspector reported that the tail rotor assembly was a unique design being tested and was not used in any other application.

The pilot reported that he had been testing this tail rotor design for four years. He stated that a tension/torsion strap and two steel pins were used to retain the blade. The pilot stated that the strap was not completely restricted from movement and over time movement and wear resulted in the failure of the retaining assembly. The pilot reported that there were 82 hours on the tail rotor assembly and it had been 6 hours since it was last inspected.

History of Flight

Maneuvering	Part(s) separation from AC (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	50
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Single
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
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:	01/05/2014
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	399 hours (Total, all aircraft), 320 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	MOSQUITO	Registration:	CF-HEZ
Model/Series:	XE	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	1004
Landing Gear Type:	Skid	Seats:	1
Date/Type of Last Inspection:	03/15/2014, Conditional	Certified Max Gross Wt.:	730 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	251 Hours	Engine Manufacturer:	Inntec
ELT:	Not installed	Engine Model/Series:	Inntec 800
Registered Owner:	On file	Rated Power:	85 hp
Operator:	On file	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KOSH, 808 ft msl	Observation Time:	1353 CDT
Distance from Accident Site:	5 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:		Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Few / 7000 ft agl	Temperature/Dew Point:	27°C / 17°C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	3 knots, Variable	Visibility (RVR):	
Altimeter Setting:		Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Oshkosh, WI (OSH)	Type of Flight Plan Filed:	None
Destination:	Oshkosh, WI (OSH)	Type of Clearance:	None
Departure Time:	1410 CDT	Type of Airspace:	

Airport Information

Airport:	Wittman Regional Airport (KOSH)	Runway Surface Type:	N/A
Airport Elevation:	808 ft	Runway Surface Condition:	Dry
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Jennifer Rodi	Adopted Date:	01/14/2015
Additional Participating Persons:	Dan Oskar; FAA; WI		
Publish Date:	01/14/2015		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=89784		

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