



National Transportation Safety Board

Aviation Accident Data Summary

Location:	Sullivan, OH	Accident Number:	CHI06LA124
Date & Time:	05/03/2006, 1900 EDT	Registration:	N9471F
Aircraft:	Hughes 269B	Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The helicopter was substantially damaged when a tail boom support fitting failed during cruise flight, which resulted in a secondary failure of the tail rotor drive shaft. The pilot initiated an autorotation and encountered a ditch during touchdown, causing the right skid to collapse. The pilot reported that the helicopter was in cruise flight when he heard a "very loud" bang. He stated that the aircraft began to yaw and he subsequently determined the aircraft had no tail rotor authority. He set up for a run-on landing to a field; however, he subsequently heard a "metal grinding sound" and a "high pitched squealing noise." He initiated an autorotation at that time. The pilot reported a "sensation of the tail boom swinging left [and] right, up [and] down." The helicopter encountered a ditch during touchdown, which collapsed the right skid. Upon exiting the helicopter, the pilot noticed that the left main tail boom support (cluster) fitting had broken loose from the frame. The tail rotor drive shaft and cluster fitting were examined by the National Transportation Safety Board Materials Laboratory. Damage to the tail rotor drive shaft was consistent with an overstress failure and appeared to be caused by rotational contact between the drive shaft and the forward tail boom closure fitting. The cluster fitting exhibited fracture markings indicative of fatigue. Fracture features on both lugs indicated localized fatigue origin areas on the outer surfaces of each lug. Federal Aviation Administration (FAA) Airworthiness Directive (AD) 2003-13-15 R1, which became effective August 10, 2004, was applicable to the accident aircraft. The AD noted that compliance was required in order "to prevent failure of a tailboom support strut or lug on a cluster fitting." The AD required modification or replacement of the original cluster fittings, part numbers 269A2234 and 269A2235, within 6 months or 150 hours time-in-service (TIS). The AD required dye penetrant inspections of the lugs within 10 hours TIS, and thereafter at intervals not to exceed 50 hours TIS, until the lugs were modified or replaced. Nominal measured lug thickness was 0.076 inch, which was consistent with the original cluster fitting configuration. The failed lug did not appear to have been modified and did not appear to be in compliance with the AD. Review of the aircraft logbook revealed that a 100 hour / annual inspection was completed on May 23, 2005. The inspection entry noted AD 2003-13-15 R1. In addition, the airworthiness compliance record noted that the AD had been complied with by performing a dye penetrant inspection without finding any cracks. The entry also stated that the modification kit was not installed at that time.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Fatigue failure of the fuselage-to-tail boom cluster fitting, and the secondary failure of the tail rotor drive shaft. An additional cause was the incomplete compliance with an applicable Airworthiness Directive. A factor was the ditch.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE - NORMAL

Findings

- 1. (C) FUSELAGE, ATTACHMENT - FATIGUE
 - 2. (C) ROTOR DRIVE SYSTEM, TAIL ROTOR DRIVE SHAFT - FAILURE
 - 3. (C) MAINTENANCE, COMPLIANCE WITH AD - NOT COMPLIED WITH - OTHER MAINTENANCE PERSONNEL
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Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

- 4. AUTOROTATION - INITIATED - PILOT IN COMMAND
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Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings

- 5. (F) TERRAIN CONDITION - DITCH
- 6. LANDING GEAR, SKID ASSEMBLY - COLLAPSED

Pilot Information

Certificate:	Commercial	Age:	56
Airplane Rating(s):	Single-engine Land	Instrument Rating(s):	None
Other Aircraft Rating(s):	Helicopter	Instructor Rating(s):	None
Flight Time:	2300 hours (Total, all aircraft), 1000 hours (Total, this make and model), 2300 hours (Pilot In Command, all aircraft), 35 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hughes	Registration:	N9471F
Model/Series:	269B	Engines:	1 Reciprocating
Operator:	On file	Engine Manufacturer:	Lycoming
Operating Certificate(s) Held:	None	Engine Model/Series:	HIO-360-A1A
Flight Conducted Under:	Part 91: General Aviation - Personal		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MFD, 1297 ft msl	Weather Information Source:	Weather Observation Facility
Lowest Ceiling:	None	Wind Speed/Gusts, Direction:	3 knots / , Variable
Temperature:	20° C	Visibility	10 Miles
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sullivan, OH (PVT)	Destination:	

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
Latitude, Longitude:	41.036944, -82.217222		

Administrative Information

Investigator In Charge (IIC):	Tim Sorensen	Adopted Date:	03/26/2007
Investigation Docket:	NTSB accident and incident docket serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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