



# Aviation Investigation Final Report

<b>Location:</b>	Arapahoe, Nebraska	<b>Accident Number:</b>	CEN09LA558
<b>Date &amp; Time:</b>	September 2, 2009, 10:40 Local	<b>Registration:</b>	N58163
<b>Aircraft:</b>	Hughes 269C	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Unknown or undetermined	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

During cruise flight in a reciprocating single-engine helicopter, the pilot heard a loud noise and felt a vibration. The pilot immediately entered an autorotation and turned the flight controls over to the flight instructor. The flight instructor elected to continue the autorotation to an open field. During the landing the helicopter's landing skids stuck into the soft terrain, causing the helicopter's nose to pitch down and tail to pitch up. The main rotor blades impacted the tail boom, severing it; the helicopter subsequently rolled onto its side. An examination of the helicopter failed to find a reason for the noise and vibration.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A sudden vibration for undetermined reasons.

## Findings

<b>Not determined</b>	(general) - Unknown/Not determined
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## Factual Information

### History of Flight

<b>Enroute-cruise</b>	Unknown or undetermined (Defining event)
<b>Autorotation</b>	Off-field or emergency landing
<b>Post-impact</b>	Roll over

On September 2, 2009, approximately 1040 central daylight time, a single-engine, Hughes 269 helicopter, N58163, was substantially damaged during a landing after entering a precautionary autorotation. The pilot and flight instructor, were not injured. The helicopter was registered and operated by a private individual. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations Part 91 cross-country flight.

In a statement submitted by the flight instructor, he reported that while in cruise flight, they heard a loud noise and the pilot immediately entered an autorotation. During the autorotation, the pilot relinquished the flight controls to the flight instructor. The flight instructor elected to continue the autorotation to a field. The instructor added that during the touch-down, the right front skid "sunk into the soft field", the helicopter's nose dropped and when the tail section rose, the main rotor blades severed the tail-boom. The helicopter subsequently rolled onto its side.

The pilot stated that, "they heard and then felt a vibration and a loud bang or explosion" that came from the aft section of the helicopter and so he entered an autorotation.

A Federal Aviation Administration (FAA) inspector, who responded to the site, reported that the helicopter's main rotor blades severed the tail-boom during the landing.

An examination of the helicopter was conducted by an FAA inspector and a technical representative from the airframe manufacturer. During the inspection the engine was started and ran normally. The transmission rotated with oil visible in the sight gauge. The drive system's "V-belts" appeared undamaged and functional; the clutch actuator operated when electrical power was applied. The engine's lower coupling to lower pulley driveshaft was intact and the splined fittings were undamaged. The helicopter's cyclic and collective controls exhibited continuity through the range of motion. The main and tail rotor blades were examined; the tail rotor blades appeared undamaged. The main rotor blades displayed various degrees of damage, consistent with a sudden stoppage at low rotor RPM and blade impact with the tail-boom and ground.

The reason for the loud noise and vibration was not found.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	55, Male
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	March 30, 2009
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	June 20, 2008
<b>Flight Time:</b>	595 hours (Total, all aircraft), 595 hours (Total, this make and model), 534 hours (Pilot In Command, all aircraft), 11 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

## Flight instructor Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	25, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Helicopter; Instrument helicopter	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	January 1, 2009
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Hughes	<b>Registration:</b>	N58163
<b>Model/Series:</b>	269C	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	740334
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	3
<b>Date/Type of Last Inspection:</b>	August 26, 2009 Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2310 Hrs as of last inspection	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	I0360 SER
<b>Registered Owner:</b>	CAVALEA CONTINENTAL FREIGHT INC	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	CAVALEA CONTINENTAL FREIGHT INC	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>		<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>		<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	1200 ft AGL	<b>Visibility</b>	7 miles
<b>Lowest Ceiling:</b>	1200 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	14 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	150°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.04 inches Hg	<b>Temperature/Dew Point:</b>	21°C
<b>Precipitation and Obscuration:</b>	In the vicinity - Patches - Fog		
<b>Departure Point:</b>	Arapahoe, NE (37V )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Colorado Plains, CO (AKO )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	40.300086,-99.890396(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Pete Kelly; FAA FSDO; Scottsdale, AZ Adrian Booth; Boeing Helicopters; Mesa, AZ
<b>Original Publish Date:</b>	April 22, 2010
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=74651">https://data.ntsb.gov/Docket?ProjectID=74651</a>

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](#).