



Aviation Investigation Final Report

Location:	Quinton, Oklahoma	Accident Number:	DFW08LA100
Date & Time:	April 7, 2008, 12:30 Local	Registration:	N34SD
Aircraft:	Hiller UH-12E	Aircraft Damage:	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot reported hearing a loud noise and experiencing vibrations while piloting his helicopter in cruise about 1,000 feet above the ground. The pilot performed an autorotation to an open field, and was able to maintain control of the helicopter throughout the autorotaion. The pilot reported that a tail rotor strike did not occur. Failed parts from the transmission, tail rotor blades, and associated tail rotor drive hardware were submitted to the NTSB for metallurgical examination. All parts appeared to have failed in overload; however, the origin of the overload failures, or whether they were pre- or post-impact, could not be determined

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An undetermined mechanical malfuction associated with the tail rotor drive system which led to a loss of control.

Findings

Aircraft	Tail rotor gearbox - Failure
-----------------	------------------------------

Factual Information

History of Flight

Enroute-cruise	Sys/Comp malf/fail (non-power) (Defining event)
Enroute-cruise	Loss of tail rotor effectiveness
Autorotation	Off-field or emergency landing

On April 7, 2008, at approximately 1230 central daylight time, a Hiller UH-12E helicopter, N34SD, was returning to a landing zone after an agricultural application when a loud noise was heard with associated vibrations. The pilot elected to perform an autorotation into a nearby field. The commercial pilot, the sole occupant of the helicopter, was not injured. The helicopter was owned and operated by Texas Air Cargo Inc. The local flight originated from private property located approximately 5 miles north of Quinton, Oklahoma. Visual meteorological conditions prevailed and no flight plan was filed for the 14 Code of Federal Regulations Part 137 agricultural application flight.

According to the pilot, the helicopter was cruising at approximately 1,000 feet above ground level when a loud noise was heard by the pilot. The pilot reported that he quickly reduced engine power and began an autorotation. Furthermore, the pilot stated there was no difficulty controlling the helicopter through the emergency landing and he was able to perform a normal flare touching down with no associated side angle. The pilot stated that the gearbox had failed resulting in the damage to the helicopter.

On-scene photos were provided by the pilot. The photos provided revealed a fracture of the tail rotor gearbox yoke, twisting of the drive shaft, and damage to the tail rotor blades. The pilot and his employees reported no evidence of a ground strike existed at the accident scene. Furthermore, another individual reported recovering a tail rotor blade "some distance" from the site of the autorotation. On a NTSB Form 6120, the pilot reported having 33,000 total hours with 30 hours in make and model.

Parts from the helicopter were recovered for examination. A metallurgic examination was conducted by the NTSB laboratory and revealed all components failed as a result of overload. Additionally, no fatigue failures were detected.

An automated weather reporting station located at McAlister Regional Airport (MLC), approximately 28 nautical miles to the south-east of the accident site, reported winds from 110 degrees at 11 knots gusting to 14 knots, visibility 10 statute miles, ceiling broken at 6,000 feet, temperature 75 degrees Fahrenheit, dew point 50 degrees Fahrenheit, and a barometric pressure of 29.93 inches of Mercury.

Pilot Information

Certificate:	Airline transport; Flight engineer; Flight instructor	Age:	65, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Center
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Glider; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	March 1, 2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 1, 2007
Flight Time:	33000 hours (Total, all aircraft), 30 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hiller	Registration:	N34SD
Model/Series:	UH-12E	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal; Restricted (Special)	Serial Number:	1618
Landing Gear Type:	High skid	Seats:	3
Date/Type of Last Inspection:	December 1, 2007 Annual	Certified Max Gross Wt.:	2800 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	4068 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	VO-540-C2A
Registered Owner:	Texas Air Cargo Inc.	Rated Power:	305 Horsepower
Operator:		Operating Certificate(s) Held:	
Operator Does Business As:	Texas Air Cargo Inc.	Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	
Observation Facility, Elevation:	MLC	Distance from Accident Site:	
Observation Time:	12:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	Broken / 6000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	11 knots / 14 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.93 inches Hg	Temperature/Dew Point:	24°C / 10°C
Precipitation and Obscuration:			
Departure Point:	Quinton, OK	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	
Departure Time:		Type of Airspace:	

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	Latitude, Longitude:	35.121944,-95.368614

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Jeff Jennings; FAA FSDO; Oklahoma City, OK Steve Palm; Hiller Aircraft; Firebaugh, CA
Original Publish Date:	December 24, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=67832

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](#).