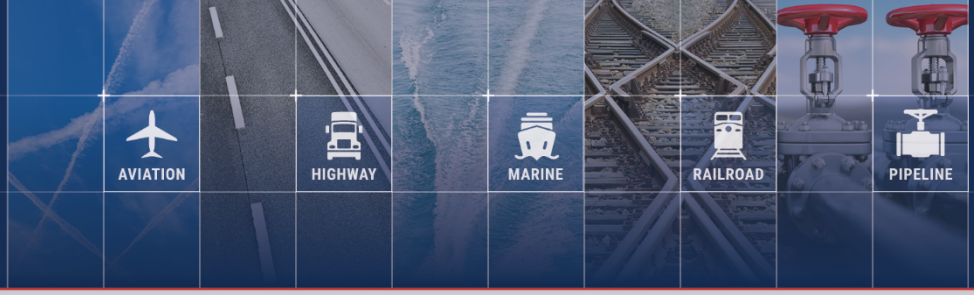

Aviation Investigation Final Report

Location:	Waitsburg, Washington	**Accident Number:**	WPR14LA206
Date & Time:	May 23, 2014, 16:02 Local	**Registration:**	N260TA
Aircraft:	WILLIAMS HELICOPTER CORP UH 1H	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Minor
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The commercial pilot was conducting an agricultural cherry drying flight in the helicopter. Surveillance video showed the helicopter lift off the ground into a momentary low hover, climb and move forward and upward, and then immediately descend while rolling toward its right side until it impacted the ground. The pilot stated that the initial takeoff into the hover felt normal and that he then increased the altitude to get out of a dust cloud generated by the helicopter. As he transitioned the helicopter to forward flight, it experienced a "violent" one-to-one vibration that continued to increase as the helicopter continued forward. The pilot aborted the takeoff and subsequently lost control of the helicopter while attempting to land.

Postaccident wreckage examination did not reveal any anomalies that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

An extreme vibration immediately after entering forward flight for reasons that could not be determined because postaccident examination of the helicopter did not reveal any anomalies that would have precluded normal operation. Contributing to the accident was the pilot's inability to maintain helicopter control during the landing.

Findings

Not determined	(general) - Unknown/Not determined
Aircraft	Prop/rotor parameters - Attain/maintain not possible
Personnel issues	Aircraft control - Pilot
Organizational issues	(general) - Manufacturer

Factual Information

History of Flight

Takeoff	Loss of control in flight (Defining event)
Uncontrolled descent	Attempted remediation/recovery

On May 23, 2014, at 1602 Pacific daylight time, a Williams Helicopter Corporation UH-1H helicopter, N260TA, crashed immediately after takeoff near Waitsburg, Washington. The commercial pilot received minor injuries and the helicopter sustained substantial damage to the rotor system and tail boom. The helicopter was registered to, and operated by, Archer Aviation under the provisions of 14 Code of Federal Regulations, Part 137. Visual meteorological conditions prevailed for the flight, and no flight plan had been filed.

The pilot stated that the initial takeoff into a hover felt normal, and he increased the altitude of the hover to get out of the dust cloud. He felt the vertical vibration (1:1 vibration) as he transitioned forward. He continued forward expecting the vibration to dissipate, however, the vibration increased in severity such that he was being thrown against his shoulder straps. He attempted to land, but the helicopter rolled right and impacted the ground.

Witnesses said that the helicopter took off stirring up a lot of dust, then came back down a few seconds later, hitting tail first and rolling on to its left side.

Surveillance video captured the helicopter's takeoff and immediate descent into terrain. The video shows the helicopter on the ground with the rotors turning. A flagpole with a flag hanging limply from the top was also in the video frame. The helicopter lifted in to a hover, stirring up dust. The helicopter then rises and proceeds up and forward out of the video frame. A second and third video cameras captured the helicopter descending with the tail low and the right side of the helicopter pointed toward the ground. Rising dust created a brownout condition and the details of the ground impact were obscured.

A Federal Aviation Administration inspector responded to the scene, examined the wreckage, collected maintenance records, retained copies of the surveillance video, and collected witness statements.

Pilot Information

Certificate:	Commercial	**Age:**	61,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	January 22, 2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	18631 hours (Total, all aircraft), 4460 hours (Total, this make and model), 18000 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	WILLIAMS HELICOPTER CORP	**Registration:**	N260TA
Model/Series:	UH 1H	**Aircraft Category:**	Helicopter
Year of Manufacture:	1970	**Amateur Built:**	
Airworthiness Certificate:	Experimental light sport (Special); Restricted (Special)	**Serial Number:**	70-15750
Landing Gear Type:	N/A; Skid	**Seats:**	2
Date/Type of Last Inspection:	May 23, 2014 Continuous airworthiness	**Certified Max Gross Wt.:**	9500 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	8315 Hrs as of last inspection	**Engine Manufacturer:**	Honeywell
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	T-53-703
Registered Owner:	ARCHER AVIATION INC	**Rated Power:**	1800 Horsepower
Operator:	ARCHER AVIATION INC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

The helicopter was configured with two seats in the cockpit, and an agricultural application hopper tank occupied the cabin area. The registered manufacturer, Williams Helicopter Corporation, data plate indicated it was a model UH-1H, SN 70-15750, serial number 039. A second data plate marked Bell Helicopter Company, indicted a model 205, UH-1H, SN 10507, customer serial number 70-15750. The Bell Helicopter data plate exhibited three locations where numbers had been stamped over other numbers; manufacturer serial number, customer serial number, and certification date. The technical representative from Bell Helicopter reported that Bell company records show that the data plate serial number was inconsistent with the data on either data plate.

A review of the maintenance records indicated that the most recent maintenance was performed on May 23, 2014, hobbs time 2,843.7 hours, total aircraft time 8,314.5 hours, and total engine time of 3,265.9

hours. The maintenance included the repair to the tail fin skin and ribs, tail rotor drive shaft cover, and a 25-hour inspection. During the wreckage examination, the hobbs time was noted as 2,843.7 hours.

WRECKAGE & IMPACT INFORMATION

On October 1, 2014, the NTSB investigator-in-charge (IIC) and a technical representative from Bell Helicopter examined the helicopter wreckage. The helicopter was positioned on the trailer used to recover the wreckage. The tail boom had been separated from the fuselage just aft of the fuselage to tail transition. The rotor head, main rotor blades, and tail rotor were not on the trailer with the main wreckage but located in a storage hangar.

Control continuity was verified by moving the cockpit flight controls (collective, cyclic, and pedals) and observing sequential movement at the stationary swash plate and tail rotor control bell crank/cables. Control continuity to the elevator was confirmed.

The tail rotor angle drive (42° gearbox) was seized due to misalignment of the drive shaft. The tail rotor gear box was fractured exposing the drive gear. Preimpact drive continuity to the tail rotor was confirmed.

Drive train continuity to the main rotor was confirmed. Main drive shaft k-flex fractured consistent with transmission aft displacement. No visible signs of heat distress to the drive system. The transmission was rotated by twisting the rotor mast manually. The transmission rotated freely with no binding. The rotor mast exhibited rotor head fracture surface and oval deformation consistent with torsional overload. The transmission was separated from all 4 mounting points and displaced aft and left. Main mast stabilizer bar pitch arm had separated and the damper reservoir had impact damage and was empty with dark dirt and oil observed around the pitch arm mount. The other main mast stabilizer bar pitch link had detached from the damper rod end. The forward two transmission mount inserts were removed by investigators and examined.

Both main rotor blades were accounted for and attached to the main rotor hub. Balance weights for both rotor blades were located. One rotor blade had 5 large blade weights in the outboard pocket, and 0 blade weights in the inboard pocket. The other blade and associated blade weights remained in the outboard pocket and 15 weights that would have fit into the inboard pocket. Both rotor mast stabilizer bars were present.

Tail rotor and gear box were attached together. Rotor blade pitch links were attached, and the rotor blades exhibited rotational leading edge and skin damage.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KALW,1194 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Few / 4700 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 9500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	23°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Waitsburg, WA	**Type of Flight Plan Filed:**	None
Destination:	Waitsburg, WA	**Type of Clearance:**	None
Departure Time:	16:02 Local	**Type of Airspace:**	Class E

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:**	46.380001,-118.203613(est)

Administrative Information

Investigator In Charge (IIC):	McKenny, Van
Additional Participating Persons:	Monty Coordes; FAA; Spokane, WA Harold Barentine; Bell Helicopter; Fort Worth, TX Joan Gregoire; Bell Helicopter; Fort Worth, TX
Original Publish Date:	July 26, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89262