Aviation Investigation Final Report

Location:	Griffith, Indiana	**Accident Number:**	CEN17LA375
Date & Time:	September 11, 2017, 11:00 Local	**Registration:**	N2686
Aircraft:	Hiller UH 12A	**Aircraft Damage:**	Substantial
Defining Event:	Flight control sys malf/fail	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor was providing dual flight instruction to a student pilot in the helicopter. About 10 minutes into the flight, while in a 3-5 ft hover, the student began to lose helicopter control and the helicopter began to spin to the right. Because the student could not regain control, the instructor took the controls, but the helicopter did not respond to cyclic inputs and left pedal input. At this point, the instructor assumed there was a loss of thrust from the tail rotor. He rolled the throttle off, and the helicopter settled to the ground and landed hard. After the landing, the instructor observed that the tail rotor and tail rotor driveshaft were not spinning and heard a grinding noise near the connection of the transmission output shaft and the tail rotor driveshaft. The instructor found that the tail rotor guard had broken off the helicopter and was about 20 ft away. The instructor could not recall if or when the tail rotor guard struck the ground. Examination of the helicopter revealed that the tail rotor driveshaft had failed near the output shaft of the tail rotor drive assembly. Substantial damage was incurred to the tail rotor and tailboom. Maintenance records were not available. Because neither the student nor the instructor could regain helicopter control, it is likely that the tail rotor driveshaft failed in flight, which led to the loss of tail rotor thrust and subsequent loss of tail rotor control.

Probable Cause and Findings

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

The loss of tail rotor thrust due to a failed tail rotor driveshaft, which resulted in a loss of tail rotor control and a hard landing.

Findings

Aircraft	Tail rotor drive shaft - Failure

Factual Information

History of Flight

Maneuvering	Flight control sys malf/fail (Defining event)
Maneuvering	Loss of control in flight
Maneuvering	Collision with terr/obj (non-CFIT)

On September 11, 2017, about 1100 central daylight time, a Hiller UH-12A helicopter, N2686, registered to a private individual, sustained substantial damage after a loss of directional control and collision with the ground following a loss of the tail rotor drive in the vicinity of Griffith, Indiana. The certified helicopter flight instructor (CFI) and his student were not injured. Visual meteorological conditions prevailed throughout the area and no flight plane was filed. The local instructional flight was being conducted under the provisions of Federal Code of Regulations Part 91. The fight originated at 1050 from the Griffith-Merriillville Airport (O5C), Griffith, Indiana.

The CFI stated that he was providing dual flight instruction to a student pilot. About 10 minutes into the flight, while in a 3-5 foot hover, the student began to lose control and the helicopter began to spin to the right. As the student could not regain control, the CFI took the controls. Upon taking the controls, the helicopter was not responding to cyclic inputs and left pedal input. At this point, the CFI assumed a loss of thrust from the tail rotor. He rolled the throttle off and the helicopter settled to the ground and landed hard.

After asking if his student was ok, the CFI exited the helicopter while the main rotor was still spinning. He observed the tail rotor and tail rotor drive shaft were not spinning and could hear a grinding noise near the connection of the transmission output shaft and the tail rotor drive shaft. After the main rotor stopped spinning, the CFI found the tail rotor guard had broken off the helicopter and was laying about 20-feet away. The CFI did not recall if or when the tail rotor guard struck the ground.

The helicopter was towed to a hangar and was inspected by a local mechanic and FAA inspector. During the inspection, it was discovered that the tail rotor driveshaft had failed near the output shaft of the tail rotor drive assembly. Substantial damage was incurred to the tail rotor and tail boom. Maintenance records were not available.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	39,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	August 17, 2017
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 19, 2017
Flight Time:	(Estimated) 1261 hours (Total, all aircraft), 95 hours (Total, this make and model), 1161 hours (Pilot In Command, all aircraft), 43 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Private	**Age:**	Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	250 hours (Total, all aircraft), 10 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hiller	**Registration:**	N2686
Model/Series:	UH 12A NO SERIES	**Aircraft Category:**	Helicopter
Year of Manufacture:	1950	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	168
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	September 1, 2017 Annual	**Certified Max Gross Wt.:**	2500 lbs
Time Since Last Inspection:	49 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2653.8 Hrs at time of accident	**Engine Manufacturer:**	Franklin
ELT:	Not installed	**Engine Model/Series:**	6V350
Registered Owner:	On file	**Rated Power:**	200 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GYY	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	12:15 Local	**Direction from Accident Site:**	250°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / 14 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	-1°C / -7°C
Precipitation and Obscuration:			
Departure Point:	Griffith, IN (05C)	**Type of Flight Plan Filed:**	None
Destination:	Griffith, IN (05C)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Airport Information

Airport:	Griffith-Merriville Airport 05C	**Runway Surface Type:**	
Airport Elevation:	634 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	41.519721,-87.399444(est)

Administrative Information

Investigator In Charge (IIC):	Lemishko, Alexander
Additional Participating Persons:	Dwayne Hudson; FAA FSDO; DuPage, IN
Original Publish Date:	July 8, 2019
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=96231