



National Transportation Safety Board Aviation Accident Final Report

Location:	Plymouth, IN	Accident Number:	CEN17LA365
Date & Time:	09/16/2017, 1715 EDT	Registration:	N123XZ
Aircraft:	GADDIS MICHAEL EXEC 162 F	Aircraft Damage:	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	Injuries:	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

As the helicopter approached the airport, the pilot reported that the helicopter's engine rpm increased, and the rotor rpm decayed. He conducted an autorotation to the field. An examination of the helicopter revealed that the helicopter's main rotor drive belt/cog belt lost teeth resulting in a failure of the belt to drive the main rotor blades. The drive belt had recently been installed, about 3.5 hours prior to the accident. The circumstances of the accident are consistent with improper tension of the cog belt resulting in a failure of the belt.

Probable Cause and Findings

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

A failure of the drive belt for reasons that could not be determined based on the available information.

Findings

Aircraft	Main rotor drive - Failure (Cause)
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

On September 16, 2017, about 1715 eastern daylight time, an amateur-built Exec 162-F helicopter, N123XZ, performed a forced landing to a field near Plymouth, Indiana. The pilot and passenger were not injured, and the helicopter was substantially damaged. The helicopter was registered to North Indiana Rotor LLC and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The local flight departed from Plymouth Municipal Airport (C65), Plymouth, Indiana.

The pilot reported that while approaching the airport, the helicopter's engine rpm increased, and the rotor rpm decayed. Unable to maintain altitude, the pilot conducted an autorotation to a field. The helicopter landed hard, the skids bent, and the tail boom buckled, resulting in substantial damage.

An examination of the helicopter by the responding Federal Aviation Administration inspector revealed that the helicopter had a Pro Drive system driving the main rotor blades. The main rotor drive belt/cog belt began losing teeth resulting in a failure of the belt to drive the main rotor blades. The Goodyear Falcon PD belt had recently been installed, about 3.5 hours prior to the accident.

History of Flight

Approach	Sys/Comp malf/fail (non-power) (Defining event)
Landing-flare/touchdown	Hard landing

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	49, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	04/04/2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	06/16/2017
Flight Time:	393 hours (Total, all aircraft), 250 hours (Total, this make and model), 346 hours (Pilot In Command, all aircraft), 26 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GADDIS MICHAEL	Registration:	N123XZ
Model/Series:	EXEC 162 F NO SERIES	Aircraft Category:	Helicopter
Year of Manufacture:	1998	Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	6377
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	08/29/2017, Annual	Certified Max Gross Wt.:	1500 lbs
Time Since Last Inspection:	277 Hours	Engines:	1 Reciprocating
Airframe Total Time:	at time of accident	Engine Manufacturer:	Rotorway
ELT:	Not installed	Engine Model/Series:	162-F
Registered Owner:	NORTH INDIANA ROTOR LLC	Rated Power:	150 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KOXI, 683 ft msl	Distance from Accident Site:	17 Nautical Miles
Observation Time:	1715 EDT	Direction from Accident Site:	268°
Lowest Cloud Condition:	Scattered / 6000 ft agl	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	200°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.06 inches Hg	Temperature/Dew Point:	28° C / 15° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	PLYMOUTH, IN (C65)	Type of Flight Plan Filed:	None
Destination:	PLYMOUTH, IN (C65)	Type of Clearance:	None
Departure Time:	1645 EDT	Type of Airspace:	Class G

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:	41.345833, -86.291944 (est)

Administrative Information

Investigator In Charge (IIC):	Jason T Aguilera	Report Date:	11/06/2019
Additional Participating Persons:	Dwayne hudson; FAA; Des Plaines, IL		
Publish Date:	11/06/2019		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=96081		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).