



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Zephyrhills, Florida	Accident Number:	ERA21LA023
Date & Time:	October 16, 2020, 15:15 Local	Registration:	N777CP
Aircraft:	Bell 206	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While in cruise flight, the pilot heard a binding sound and felt a reduction in engine power. The low rotor rpm aural alarm then sounded, and he initiated an autorotation to swampy terrain. The helicopter came to rest amongst pine trees and undergrowth. The tailboom was impact-separated and the main rotors were fractured about midspan.

During a detailed examination of the helicopter, the “B” nut at the engine fuel control unit was found loose with no thread engagement. During a test run of the engine, the “B” nut was tightened and torqued to proper specification. The engine ran smoothly and continuously at all power settings.

A review of the helicopter’s maintenance records revealed the last annual inspection was completed about 75 hours prior to the accident. The pilot, who also holds an airframe and powerplant certificate, was the last person to perform maintenance on the engine.

According to the Rolls-Royce maintenance manual, torque paint must be applied to all the rigid tube “B” nuts to ensure proper tightening. According to the maintenance manual, “failure to properly install, align, and tighten fuel, oil, and air fittings could result in an engine failure.”

Probable Cause and Findings

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

Improper torquing of the “B” nut at the fuel control unit, which led to a total loss of engine power and subsequent autorotation that resulted in substantial damage.

Findings

Aircraft	Fuel controlling system - Incorrect service/maintenance
Personnel issues	Scheduled/routine maintenance - Maintenance personnel

Factual Information

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
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On October 16, 2020, about 1515 eastern daylight time, a Bell 206B, N777CP, was substantially damaged when it was involved in an accident near Zephyrhills, Florida. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, about 15 minutes after departure, he heard a “binding sound” and felt a reduction in engine power and a slight nose left yaw. He checked his engine instruments and noted no illumination of annunciator lights or engine warnings. The low rotor rpm aural alarm then sounded, and he initiated an autorotation to swampy terrain.

According to the Federal Aviation Administration inspector who responded to the accident site, the helicopter came to rest among pine trees and undergrowth. The tailboom was impact-separated, and the main rotors were fractured about midspan.

A detailed examination revealed the “B” nut at the engine fuel control unit was loose with no thread engagement. The nut was also missing the torque stripe markings on the line as required by the Rolls-Royce maintenance manual. During a test run of the engine, the “B” nut was tightened and torqued to proper specification. The engine ran smoothly and continuously at all power settings.

A review of the helicopter’s maintenance records revealed the last annual inspection was completed about 75 hours prior to the accident. At that time, the Nos. 1 and 2 turbine wheels were replaced. The pilot also holds an airframe and powerplant certificate and was the last person to perform maintenance on the engine.

According to the Rolls-Royce maintenance manual, torque paint must be applied to all the rigid tube “B” nuts and reapplied each time the nut is loosened and tightened. The manual states that “Proper tightening of the engine tubing connections is critical to flight safety. Failure to properly install, align, and tighten fuel, oil, and air fittings could result in an engine failure.”

Pilot Information

Certificate:	Commercial	Age:	57,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Lap only
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	April 16, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 23, 2018
Flight Time:	6860 hours (Total, all aircraft), 2400 hours (Total, this make and model), 6600 hours (Pilot In Command, all aircraft), 80 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N777CP
Model/Series:	206 B	Aircraft Category:	Helicopter
Year of Manufacture:	1981	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	3429
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	August 8, 2020 Annual	Certified Max Gross Wt.:	3200 lbs
Time Since Last Inspection:	74.2 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	12582 Hrs as of last inspection	Engine Manufacturer:	Rolls Royce
ELT:	Not installed	Engine Model/Series:	250 C20-B
Registered Owner:	On file	Rated Power:	420 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:	ZPH,90 ft msl	Distance from Accident Site:	12 Nautical Miles
Observation Time:	15:15 Local	Direction from Accident Site:	237°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.98 inches Hg	Temperature/Dew Point:	31°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Plant City, FL	Type of Flight Plan Filed:	Company VFR
Destination:	Jacksonville, FL (KCRG)	Type of Clearance:	None
Departure Time:	15:00 Local	Type of Airspace:	Class E

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:	28.338616,-81.957469

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent
Additional Participating Persons:	James Boles; FAA/FSDO; Orlando, FL Dave Riser; Rolls Royce; Indianapolis, IN
Original Publish Date:	July 7, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=102161

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