



Aviation Investigation Final Report

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|--------------------------------|---------------------------------------|-------------------------|-------------|
| Location: | North Charleston, South Carolina | Accident Number: | ERA23LA319 |
| Date & Time: | August 1, 2023, 15:30 Local | Registration: | N31PB |
| Aircraft: | BELL HELICOPTER TEXTRON CANADA 407 | Aircraft Damage: | Substantial |
| Defining Event: | Flight control sys malf/fail | Injuries: | 1 Minor |
| Flight Conducted Under: | Public aircraft | | |

Analysis

The pilot reported that, about 35 minutes into the flight, he noticed that the helicopter began to yaw to the right and his pedal inputs did not correct the situation. He contacted the tower at his destination and declared an emergency. As he approached the runway for a straight-in landing, the helicopter yawed again. He lowered the collective, but the helicopter continued to yaw right. He then reduced the throttle and attempted to maintain a level attitude. The helicopter struck the ground at a high rate of descent, coming to rest in the grass adjacent to runway. The helicopter sustained substantial damage to the fuselage, main rotor system, and tail rotor system.

A postaccident examination of the helicopter found one of the two bolts that secured the tail rotor pitch change lever assembly was missing. The lever assembly was disconnected from the trunnion, resulting in the loss of tail rotor control. The other bolt that connected the levers to the rod assembly was in place, but loose; the cotter pin for its attachment nut was missing.

A review of the maintenance records revealed that a 300 hour/3 month inspection was performed on the helicopter about 15.4 flight hours before the accident. According to the helicopter manufacturer, that recent inspection would not have required removal of the lever assembly bolts; however, the nuts and bolts should have been clearly visible during the inspection of the area. The mechanic who performed the inspection stated that he must have overlooked them.

Probable Cause and Findings

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

A failure of the tail rotor pitch change lever assembly due to incorrectly installed bolts and maintenance personnel's inadequate inspection of the tail rotor control system.

Findings

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| Aircraft | (general) - Inadequate inspection |
| Personnel issues | Scheduled/routine inspection - Maintenance personnel |
| Personnel issues | (general) - Maintenance personnel |

Factual Information

History of Flight

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|-----------------------------------|---|
| Approach-VFR pattern final | Flight control sys malf/fail (Defining event) |
| Landing | Hard landing |

On August 1, 2023, about 1530 eastern daylight time, a Bell Helicopter Textron Canada 407, N31PB, was substantially damaged when it was involved in an accident near North Charleston, South Carolina. The commercial pilot sustained minor injuries. The helicopter was operated as a public aircraft.

The helicopter, operated by the Charleston County Sheriff's Office, was on a positioning flight from Sumter Airport (SMS), Sumter, South Carolina, to Charleston AFB International Airport (CHS), North Charleston, South Carolina. The pilot reported that, after about 35 minutes of flight, the helicopter started to yaw slowly to the right. The pilot applied left pedal with no response. The pilot stated, "It felt as if the pedals were not attached." He contacted CHS tower and declared an emergency. He set up for a straight-in approach to runway 15. While crossing the runway threshold, about 20 ft above ground level, the helicopter started to yaw to the right. He lowered the collective, but the helicopter continued to yaw right. He then reduced the throttle and attempted to maintain a level attitude. The helicopter struck the ground adjacent to runway 15 at a high rate of descent, coming to rest in the grass. The tail rotor boom severed during the impact sequence.

Inspectors with the Federal Aviation Administration (FAA) responded to the accident site and examined the wreckage. They confirmed substantial damage to the fuselage, main rotor system, and tail rotor system. They found 1 of the 2 bolts that secured the tail rotor pitch change lever assembly was missing (Photo 1). The lever assembly was disconnected from the trunnion. The other bolt that connected the levers to the rod assembly was in place, but loose; the cotter pin for its attachment nut was missing (Photo 2).

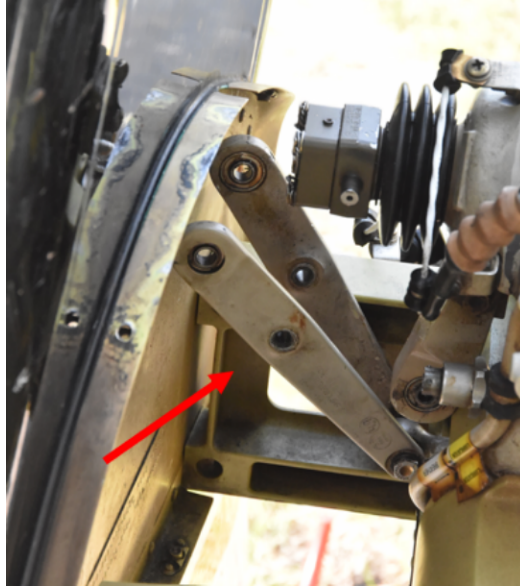


Photo 1: Tail rotor Pitch Change Lever Assembly. Red arrow points to area of missing bolt.

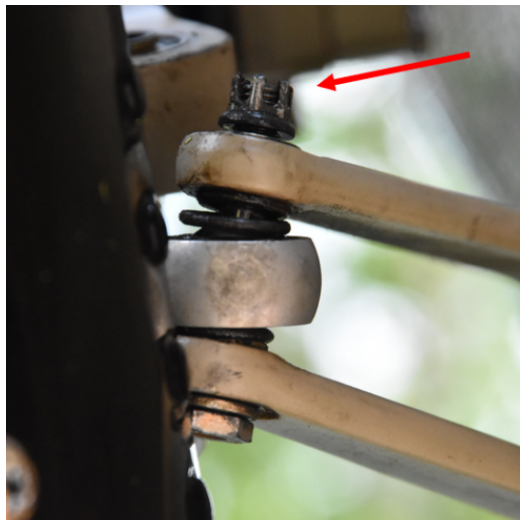


Photo 2: Pitch Change Lever Assembly. Red arrow points to loose nut on bolt; cotter pin was missing.

A review of the maintenance records by FAA inspectors revealed that a 300 hour/3 month inspection was performed on the helicopter on June 28, 2023. The helicopter had been flown about 15.4 hours since this inspection. According to Bell Helicopter technical support personnel, the inspection/lubrication procedure that was accomplished on June 28 would not require removal of the lever assembly bolts; however, the nuts and bolts should have been clearly visible during the inspection of the area. The mechanic who performed the inspection stated that he must have overlooked them.

Pilot Information

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| Certificate: | Commercial | Age: | 57, Male |
| Airplane Rating(s): | Single-engine land | Seat Occupied: | Right |
| Other Aircraft Rating(s): | Helicopter | Restraint Used: | |
| Instrument Rating(s): | Airplane; Helicopter | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | |
| Medical Certification: | Class 2 With waivers/limitations | Last FAA Medical Exam: | October 28, 2022 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | February 2, 2022 |
| Flight Time: | 3743 hours (Total, all aircraft), 333 hours (Total, this make and model), 3505 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|--------------------------------------|---|---------------------------------------|---------------|
| Aircraft Make: | BELL HELICOPTER TEXTRON CANADA | Registration: | N31PB |
| Model/Series: | 407 | Aircraft Category: | Helicopter |
| Year of Manufacture: | 2012 | Amateur Built: | |
| Airworthiness Certificate: | Normal | Serial Number: | 54321 |
| Landing Gear Type: | Emergency float; High skid | Seats: | 7 |
| Date/Type of Last Inspection: | June 28, 2023 Annual | Certified Max Gross Wt.: | 5250 lbs |
| Time Since Last Inspection: | 15 Hrs | Engines: | 1 Turbo shaft |
| Airframe Total Time: | 4617 Hrs at time of accident | Engine Manufacturer: | Rolls-Royce |
| ELT: | C91A installed, activated, did not aid in locating accident | Engine Model/Series: | C47B |
| Registered Owner: | COUNTY OF CHARLESTON | Rated Power: | |
| Operator: | Charleston County Sheriff's Office | Operating Certificate(s) Held: | None |

Meteorological Information and Flight Plan

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| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Day |
| Observation Facility, Elevation: | KCHS,48 ft msl | Distance from Accident Site: | 0 Nautical Miles |
| Observation Time: | 15:56 Local | Direction from Accident Site: | 165° |
| Lowest Cloud Condition: | Scattered / 4500 ft AGL | Visibility | 10 miles |
| Lowest Ceiling: | Broken / 5500 ft AGL | Visibility (RVR): | |
| Wind Speed/Gusts: | 9 knots / | Turbulence Type Forecast/Actual: | None / None |
| Wind Direction: | 110° | Turbulence Severity Forecast/Actual: | N/A / N/A |
| Altimeter Setting: | 30.03 inches Hg | Temperature/Dew Point: | 31°C / 22°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | Sumter, SC (SMS) | Type of Flight Plan Filed: | None |
| Destination: | North Charleston, SC | Type of Clearance: | VFR |
| Departure Time: | 14:45 Local | Type of Airspace: | Class C |

Airport Information

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|-----------------------------|----------------------------------|----------------------------------|----------------|
| Airport: | Charleston AFB International CHS | Runway Surface Type: | Concrete |
| Airport Elevation: | 46 ft msl | Runway Surface Condition: | Dry |
| Runway Used: | 15 | IFR Approach: | None |
| Runway Length/Width: | 9001 ft / 150 ft | VFR Approach/Landing: | Forced landing |

Wreckage and Impact Information

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| Crew Injuries: | 1 Minor | Aircraft Damage: | Substantial |
| Passenger Injuries: | N/A | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Minor | Latitude, Longitude: | 32.90605,-80.04328(est) |

Administrative Information

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| Investigator In Charge (IIC): | Hicks, Ralph |
| Additional Participating Persons: | Charles Lewis; FAA/FSDO; Columbia, SC Nora Vallée; Transportation Safety Board of Canada; Gatineau, OF Gary Howe; Bell Helicopter; Ft. Worth , TX |
| Original Publish Date: | May 14, 2024 |
| 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=192772 |

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](#).