



NATIONAL TRANSPORTATION SAFETY BOARD

Eastern Region – Ashburn, Virginia

Wreckage Exam Summary

Date: August 26, 2022

Location: AMF Aviation, Springfield, TN

Present:

Leah Read, NTSB IIC

Ian Mullins, FAA

Jack Johnson, Rolls Royce

Mark Stuntzner, Bell Textron Aviation

HISTORY OF FLIGHT

On August 23, 2022, about 1445 central standard time, a Bell 206B helicopter, N770HP, was substantially damaged when it was involved in an accident near Whiteside, Tennessee. The pilot and the passenger were fatally injured. The flight was conducted as a Title 14 Code of Federal Regulations Part 91 Public Use flight.

The helicopter was operated by the Tennessee Department of Safety. The pilot, who was an officer with the Tennessee Department of Safety, and the passenger/observer, who was a detective with the Marion County Sheriff's Department, struck a marked, 1-inch thick energized (161K volt) aluminum high tension powerline cable, while executing a marijuana eradication mission.

WRECKAGE EXAMINATION

The helicopter came to rest north of Highway 24 and west of the 430 ft tall powerlines in heavily wooded and steep terrain. The nose of the helicopter was embedded in the ground vertically with the tail section pointed straight up in the air. There was no post-impact fire. The outboard section of the tail boom (minus the tail rotor) was located downhill of the helicopter. This section exhibited an impact consisted with contact of the main rotor blade. The tail rotor (minus one blade) and the top portion of the vertical stabilizer exhibited impact damage and was located under the powerlines approximately 100 ft east of where the helicopter came to rest. The other tail rotor blade was not located.

Each of the two main rotor blades were marked with either red or white dot to differentiate between the two blades. The white blade remained partially attached to the main rotor hub and was fractured about 4 ft from the hub. The red blade separated about 4 ft from the hub and was found uphill of where the helicopter came to rest. Examination of the "white" blade revealed impact marks consistent with impact with the powerline about two-thirds outboard of the blade. The red blade exhibiting arcing at the trailing edge tip of the blade.

The cockpit area and forward fuselage sustained extensive impact damage. Numerous overload breaks from impact were observed throughout the flight control system; however, continuity was established from the cockpit to the main rotor and tail rotor.

The engine remained attached to the helicopter and no damage was observed to any of the mounts. Oil had pooled within the exhaust collector, consistent with the helicopter's vertical position from impact.

Examination of the engine revealed all B-nuts and fittings were properly installed and hand tight. The control air tubing did not reveal any evidence of pre-impact damage. Shop air was applied to the Pc line and a soap solution was applied liberally across the pneumatic system; no leakage was detected.

Shop air was also applied to the compressor check valve to test its function; the valve cycled normally.

A borescope was used to internally inspect the compressor. There was no evidence of blade or vane damage. A small area of the 1st stage compressor blade track exhibited evidence of blade rub at the 6 o'clock position.

Manual rotation of the compressor (N1) was smooth, with no binding. N1 continuity was established from the compressor through the gearbox to the starter/generator and gas-generator turbine.

Manual rotation of the power turbine (N2) was also smooth, with no binding or unusual noise. Continuity from the power turbine to the power output shaft to the main rotor and tail rotor drive coupling was established. Coupling for both the main rotor and tail rotor drives appeared to have failed in overload.

Rotational scoring marks were evident at both the main and tail rotor output shafts.

Due to extensive airframe damage, control continuity could not be established from the collective and twist grip to the engine. However, both the Fuel Control Unit (FCU) and Power Turbine Governor (PTG) were found to be undamaged. The control arms for both units moved freely, with no binding or abnormal resistance.

The fuel supply line to the spray nozzle was removed. About 1 teaspoon of fuel was drained from the line and was absent of debris. The fuel was tested for water with water-finding paste,

and no water was observed. A sample of fuel was collected from the airframe fuel filter. The sample was also clean with no detectable water.

The fuel spray nozzle was removed and examined; the spray face had normal carbon sooting and was otherwise unremarkable. The nozzle was not disassembled.

Removal of the fuel spray nozzle allowed access to visually examine the gas generator turbine and combustion sections via borescope. Borescope inspection of the gas-generator turbine revealed no evidence of operational damage or failure, nor evidence of thermal damage or erosion. The 1st stage turbine blades appeared to be in good condition, with no impact marks or thermal erosion. Manual rotation of the compressor rotor resulted in corresponding rotation of the gas generator turbine and starter/generator, confirming N1 continuity.

The combustion section exhibited no evidence of abnormal combustion, streaking or asymmetric flame pattern. The combustion liner was intact, with no signs of cracking or degradation.

Bright silver metallic splatter was noted on the turbine nozzle shield. (Silver splatter on the nozzle shield is typical when the engine is subjected to a major impact while it is running. Material from the centrifugal compressor lining is liberated by contact from the rotating compressor. The material is then melted by combustion in the turbine section and deposited on the nozzle shield.)

The upper and lower chip detectors were removed and examined. Both chip detectors were absent of ferrous debris.

Oil was present in the engine's auxiliary gearbox and the airframe-mounted oil reservoir. The oil was clean with no abnormal odor, entrained water, or observable particulate matter.

No preimpact mechanical deficiencies were observed that would have precluded normal operation of the engine or airframe at the time of impact.