

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN25LA031

EXAMINATION SUMMARY

December 11, 2024

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A. ACCIDENT

Location: Pearland, Texas
Date: October 27, 2024
Time: 0830 central daylight time
Aircraft: Robinson R-22 Beta, N7521Z

B. EXAMINATION SUMMARY

Investigator-in-Charge (IIC) Timothy Sorensen
Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Investigator Brad Miller
Air Safety Investigator
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C. ACCIDENT SUMMARY

On October 27, 2024, about 0830 central daylight time, a Robinson Helicopter R-22 Beta, N7521Z, was substantially damaged when it was involved in an accident near Pearland, Texas. The pilot sustained minor injuries. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

A post-recovery examination was conducted on December 11, 2024, by NTSB investigators at the operator's maintenance facility in Seguin, Texas.

D. EXAMINATION SUMMARY

1.0 Airframe Examination¹

Robinson R-22 Beta (s/n 3810)

The left and right sides of the fuselage and the firewall exhibited localized deformation. Portions of the windshield were broken out. The instrument console was dislocated. The fuselage appeared otherwise intact. The forward and aft landing skid cross-tubes were fractured at the left fuselage attachment points. Additionally, the left skid was fractured at the aft strut and separated.

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

The main rotor mast was intact. Both main rotor blades remained secured to the hub at the root. The blades were deformed and exhibited scrapping damage. The blade skin and core were torn through from the trailing edge to the leading-edge spar at several locations. The leading-edge spars remained continuous.²

The swash plate and main rotor pitch change links were intact. Cyclic control continuity (forward-aft and left-right) was confirmed from the cockpit to the main rotor blades. Similarly, collective control continuity was confirmed from the cockpit control to the main rotor blades. No pre-impact anomalies with respect to the cyclic and collective controls were observed.

The main rotor transmission remained secured to the airframe and appeared undamaged. The drive shaft from the transmission common to the clutch assembly (upper V-belt sheave) was continuous and securely attached. Similarly, the flex coupling was intact and secure. Rotation of the drive shaft resulted in corresponding rotation of the main rotor mast via the transmission. Rotation under hand pressure was smooth and without binding. The V-belts were continuous, engaged on the clutch assembly and the lower sheave, and under tension. The lower tension actuator assembly bearing common to the lower sheave was misaligned. It was otherwise properly connected to the actuator assembly and engaged on the lower sheave shaft. The damage was consistent with impact forces, and the actuator assembly appeared to be otherwise intact. The actuator motor assembly appeared undamaged. No evidence of a pre-impact anomaly with respect to the main rotor drive train was observed.

The forward approximate 4-foot section of the tailboom remained attached to the fuselage and was deflected to the right. The remaining approximate 8-foot section of the tailboom was separated. The tail rotor assembly was separated from the tail boom. Similarly, the empennage was separated from the tail rotor assembly. The vertical and horizontal stabilizers exhibited localized damage but appeared otherwise intact. The separations and fracture surfaces appeared consistent with impact forces. The tail rotor blades were separated near the blade roots. The inboard portion of the blades remained attached to the hub. The separated portion of both blades were fragmented.

Anti-torque pedal control continuity was confirmed from each of the pedals to the push-pull tube at the forward end of the tail boom. The remaining portion of the tail rotor push-pull tube remained with the separated section of the tail boom. The aft approximate 3 feet of the push-pull tube was twisted into a corkscrew shape within the tail boom consistent with rotation of the tail rotor drive shaft at the time of impact. The aft approximate 6-inch segment of the tail rotor push-pull tube remained

² Both main rotor blades were cut about 3-feet outboard of the blade roots to facilitate recovery from the accident site.

attached to the tail rotor bellcrank. The tail rotor bellcrank and blade pitch change links were secure and intact. Movement of the bellcrank resulted in corresponding movement of the tail rotor blades. Each separation exhibited crushing damage and fracture surface features consistent with overload separations. No pre-impact anomalies with respect to the anti-torque (tail rotor) controls were observed.

The tail rotor drive shaft was separated from the clutch drive shaft at the forward flex coupling. The tail rotor drive shaft was deformed but continuous from the separated forward to the aft flex coupling. The aft flex coupling was damaged but remained secured to the tail rotor transmission. Tail rotor transmission continuity was confirmed. Rotation of the attached portion of the drive shaft resulted in corresponding rotation of the tail rotor hub. The rotation under hand pressure was smooth and without binding. Observed damage to the tail rotor drive shaft and flex couplings was consistent with impact forces. No evidence of a pre-impact anomaly with respect to the tail rotor drive train was observed.

The recording hour (Hobbs) meter indicated 0069.71 at the time of the exam. The maintenance (MX) meter indicated 0054.46 at the time of the exam.

2.0 Engine Examination

Lycoming O-360-J2A (s/n L-40959-36E)

The engine remained securely attached to the engine mounts. Visual examination of the engine did not reveal any damage or anomalies. The engine was not examined further. Engine control continuity (throttle, mixture, carburetor heat) was confirmed from each cockpit control to the carburetor and air box (carburetor heat slider valve), respectively.

The fanwheel remained securely attached to the engine. It exhibited localized deformation and scraping damage consistent with impact forces. Similarly, the upper and lower scroll halves (fanwheel shroud) remained attached to the engine shroud. However, portions of the lower scroll were broken out with localized delamination. The damage was also consistent with impact.

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