

NATIONAL TRANSPORTATIONS SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

SUMMARY OF AIRCRAFT EXAMINATION

-- CEN21FA410 --

A. ACCIDENT

Location: Mentone, Texas
Date: September 10, 2021
Time: 0930 central daylight time
Aircraft: Robinson Helicopter R-22 Beta (s/n 3396), N292DD

B. PARTICIPANTS

Timothy Sorensen
Sr. Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Robert Smith
Aviation Safety Inspector
Federal Aviation Administration – Flight Standards
Lubbock, Texas

C. ACCIDENT SUMMARY

On September 10, 2021, about 0930 central daylight time, a Robinson Helicopter R-22 Beta, N292DD, was substantially damaged when it was involved in an accident near Mentone, Texas. The pilot was fatally injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 aerial observation flight.

D. DETAILS OF AIRCRAFT EXAMINATION

The NTSB responded to the accident site. The helicopter was recovered to the operator's facility in Sterling City, Texas, on September 11, 2021. Post-recovery airframe and engine examinations were conducted by the NTSB investigator-in-charge and a representative of the FAA. The aircraft was released to the operator at the conclusion of the examinations. The GPS unit was retained for further examination and download.

Summary of Aircraft Examination

E. DESCRIPTION OF ACCIDENT SITE

The accident site was located in an area of low brush. The main wreckage was positioned about 50 ft from a set of power lines. The power line support poles extended to about 50 ft above ground level (agl); the transmission lines were about 40 to 45 ft. agl. One power transmission line was separated and draped across the four remaining intact lines. An oil well rig was located about 140 ft north-northwest of the main wreckage. The rig extended to approximately 75 ft. agl. There were no other obstacles in the vicinity of the accident site.

The helicopter came to rest on its right side oriented on a 100° heading. The main wreckage consisted of the fuselage, engine, main rotor blades, forward portion of the tail boom, and the landing skids. The aft 3 ft of the tail boom, including the tail rotor, was separated and located about 33 ft west of the main wreckage. Several fragments of the tail boom and the tail rotor drive shaft were located at the accident site.

F. SUMMARY OF EXAMINATION¹

Airframe – Robinson Helicopter R22 Beta (s/n 3396)

The helicopter came to rest on its right side. The forward portion of the fuselage was deformed.² The windshield was fragmented and located in the immediate vicinity of the fuselage. The cockpit area was compromised. The right side of the fuselage exhibited crushing damage consistent with impact to that side of the helicopter. The main rotor mast and transmission remained attached but were dislocated. Both main rotor blades remained secured to the hub. Both landing skids remained appeared intact.

The lower, left portion of the fuselage nose exhibited a small circular discoloration consistent with electrical arcing damage. Repetitive longitudinal marks consistent with contact to a transmission line proceeded below and outboard from the initial arcing damage. The left and right forward skid support fittings exhibited a loss of paint adjacent to the fuselage. The upper surfaces of both skids displayed intermittent loss of paint.

The forward portion of the tail boom remained attached to the fuselage; however, it was dislocated (angled) downward at the forward end. The aft portion of the tail boom was separated. Tail boom fragments were recovered at the accident site. The fragments exhibited deformation and scuffing damage consistent with a main rotor blade strike. The vertical and horizontal stabilizers remained attached to the aft tail boom.

The cyclic and collective controls were continuous from the control stick to the swash plate. Both main rotor blades remained attached to the hub. They were deformed and damaged over the entire span of the blades. Both pitch changes links were fractured. The fracture surfaces appeared consistent with overstress. Tail rotor control continuity was continuous from the cockpit anti-torque pedals to the aft tail boom separation point. The tail rotor control tube was fragmented at the tail boom separation. The rod fragments were recovered at the accident site. The aft portion of the control tube remained attached to the tail rotor transmission. Movement of the control tube resulted in corresponding movement of the pitch change links and the tail rotor blades.

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

² Local authorities stated the windshield center and door posts were cut by first responders.

Summary of Aircraft Examination

Main rotor drive continuity was confirmed. The main rotor transmission rotated smoothly with no anomalies noted. The belt tension actuator assembly remained secured to the clutch assembly and the lower sheave and appeared intact. The tail rotor drive shaft was separated at the forward coupling. The fracture surface appeared consistent with overstress. The tail rotor drive shaft was fragmented at the tail boom separation. The fragments were recovered at the accident site. The tail rotor transmission was intact and secured to the aft tail boom. Tail rotor transmission rotated smoothly, and continuity was confirmed. The tail rotor blades remained attached to the transmission. Both blades exhibited minor deformation.

No anomalies consistent with an in-flight failure of the airframe structure or a pre-impact malfunction of the rotor drive or flight control systems were observed.

Engine – Lycoming O-360-J2A (s/n L-25261-36A)

The engine remained installed in the helicopter. The engine mount remained secured to the airframe and engine. The mount was deformed, and one tube was fractured consistent with impact forces. Internal engine and accessory section continuity were confirmed via crankshaft rotation. Cylinder compression and suction were observed on cylinder nos. 1, 2, and 3. Cylinder no. 4 was fractured consistent with impact forces; no compression was observed. Valve movement was observed on all cylinders. The intake system exhibited impact damage but appeared otherwise intact and secure. The intake air filter was intact and appeared unobstructed. The exhaust system appeared intact.

The magnetos remained securely attached to the engine and appeared intact. The magnetos produced spark across the bottom ignition harness leads. The bottom spark plugs appeared undamaged and exhibited normal combustion signatures. The top spark plugs were not removed. The carburetor remained secured to the engine and appeared undamaged. The throttle and mixture control arms were free to rotate. Throttle, mixture, and carburetor heat control linkages were continuous from the engine to the cockpit. Fuel system continuity from the tank to the carburetor inlet was confirmed. The fuel sample taken at the carburetor inlet was clear and free of debris or sediment. The sample exhibited a blue tint consistent with 100 low lead aviation fuel.

No anomalies consistent with an inability to produce rated engine power were observed.

----- end of summary -----