

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA142

EXAMINATION SUMMARY

March 30, 2023

A. ACCIDENT

Location: Port Allen, LA
Date: March 26, 2023
Time: 02:38 Central Daylight Time
Helicopter: Robinson R44 II

B. EXAMINATION SUMMARY

IIC	Aaron Sauer NTSB Denver, CO
Party Coordinators	David Harsanyi Lycoming Engines Williamsport, PA Ken Martin Robinson Helicopter Company Torrance, CA

C. SUMMARY

On March 26, 2023, about 0238 central daylight time, a Robinson R44 II helicopter, N441PD, was destroyed when it was involved in an accident near Port Allen, Louisiana. The private pilot and tactical flight officer were fatally injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 aerial observation flight.

According to Baton Rouge Police Department (BRPD) personnel and ADS-B data, the BRPD helicopter, call sign Air 1, departed the Baton Rouge Metropolitan Airport (BTR), Baton Rouge, Louisiana, about 0226, to provide aerial support to ground BRPD units that were conducting a high-speed pursuit of a fleeing vehicle. Air 1 advised dispatch and ground units via radio that they were assisting and requested updates to the vehicle movement and location. ADS-B data showed the helicopter depart BTR to the south, turn west, then overfly Highway 190, west of Baton Rouge. Unable to maintain a safe pursuit of the vehicle, BRPD dispatch terminated the pursuit to all BRPD units, including the helicopter, via radio at 0235. There were no further communications received from the helicopter. About that time, the data showed the helicopter execute a shallow left deviation to the south of Highway 190. Following the deviation, a left turn was initiated, the turn rate increased, and followed by a series of turns and altitude changes. The ADS-B data ended at 0238 at an altitude of about 1,450 above ground level (agl). There were no witnesses to the accident.



Figure 1. Main wreckage at accident site.



Figure 2. Main wreckage at recovery facility.

Airframe:

Cockpit/Cabin - collective found in a close to full up position. Throttle twist grip full on. Mixture full rich. Governor switch on. Removable pedals/collective installed. No option to remove cyclic. Warning/caution lights - low RPM - Broken, Clutch - stretched. Rotor brake - broken. Instrument console separated and located in debris field. 5-pt. restraints installed. Lower crotch strap did not appear to be secure.



Figure 3. Upper instrument console (Source: Robinson Helicopter).



Figure 4. Lower instrument console (Source: Robinson Helicopter).

Fuel System - both fuel tanks separated from aircraft. Main fuel tank cap - not located. Aux tank fuel cap secure. Inlet and outlet fuel lines separated at main tank. Intact to fuel servo. Inlet line and t-fitting fractured. Return line to aux tank intact. Gasculator contained minimal fuel. Screen basically clean. Vent lines disconnected in a couple locations, air blown through, no obstruction.

Powerplant controls - mixture full rich in cockpit and servo. Throttle full in cockpit, full closed at servo. Overtravel spring intact, but damaged.

Rotation signatures - scoring on aft and forward surface of upper sheave. Little scoring on belt tension actuator. Rotation signatures on inlet rings for cooling fan scroll - upper and lower.



Figure 5. Rotational scoring on the forward surface of the upper sheave (Source: Robinson Helicopter).



Figure 6. Rotational scoring on the lower half of the fan scroll (Source: Robinson Helicopter).

Driveline - drive belts - 3 of 4 intact. No signs of rolling. Not in grooves due to upper clutch shaft displaced. Belt tension actuator fracture between the anti-rotation scissors and upper bearing. Both belt tension actuator bearings rotated - smooth. Clutch locked and freewheeled normally. Forward flex coupling was separated at the input yoke. Main rotor gearbox had a hole in case. Shaft rotated manually. Elastomeric teeter stops crushed through the center. Main rotor blades - S/N 14629, basically intact, spindle was straight. S/N 14476, spindle bent downward and torn open. Spar separated 11 ft 3" from coning bolt. 2.5 ft piece of aft body was separated from blade and located in tree/debris field. Outboard 5 ft of blade not located. Leading blade damage that corresponded with windshield center bow. Blade separation location corresponded with forward fuselage nose structure. Intermediate flex coupling separated. Tail rotor driveshaft damper attachment structure to tail cone partially separated. Friction linkage felt normal. Tail rotor driveshaft intact, aft flex coupling intact. Tail rotor gearbox intact, output shaft bent slightly. Gearbox rotated 360-degrees; oil visible. Main gearbox and tail gearbox chip plugs clean/clear. Tail rotor blades - one undamaged, one folded (embedded in terrain).



Figure 7. Main rotor gearbox and mast (Source: Robinson Helicopter).



Figure 8. Main rotor head and inboard main rotor blades.



Figure 9. Tail rotor blades and gearbox.



Figure 10. Intermediate flex coupling (Source: Robinson Helicopter).



Figure 11. Main rotor blades and damage.

Flight controls - all 3 servos moved when manually input. All fractures were overload.
Missing pilot cyclic grip, missing bottom of control tube between mixing bell crank

and servo. Missing rod end at main rotor blade pitch link. Tail rotor pitch change slider free to move.



Figure 12. Main rotor head controls (Source: Robinson Helicopter).



Figure 13. Tail rotor pitch links and bellcrank (Source: Robinson Helicopter).

Structure - evidence of main rotor strike at cabin structure above FLIR ball, top of windshield bow, and door frame above left seat passenger. Mast fairing intact, but damaged. Tail cone/boom partially separated, retained by controls and cables. No evidence of main rotor contact. Stinger intact. Empennage intact, upper vertical bent over consistent with impact. Tail cone battery installed; battery separated. Main rotor

transmission, mast, and main rotor blade assembly was separated at the main rotor gearbox attach points. Assembly located in wooded terrain about 250-300 ft from main wreckage. Miscellaneous forward cockpit structure located between main rotor assembly and main wreckage. FLIR ball separated and located in debris field.



Figure 14. Top of windshield bow consistent with main rotor blade impact (Source: Robinson Helicopter).



Figure 15. Separated metal from above camera gimbal mount consistent with main rotor blade impact (Source: Robinson Helicopter).



Figure 16. Windshield bow and corresponding main rotor blade impact.

Emergency locator transmitter - found in debris field and separated from mounting structure. The antenna wire was severed about 4 inches from the transmitter.



Figure 17. ELT located in the debris field with antenna wire severed.

Landing gear - intact and partially separated from airframe.



Figure 18. Landing gear skids.

The helicopter was factory delivered to Baton Rouge PD as a police configuration.

Engine:

Cylinders 1, 3, 5, impact damage with molded valve covers and push rods. All top spark plugs, and valve covers removed, engine rotation confirmed by manually rotation. 3, 5 pushrods removed due to extensive bending. Suction and compression noted on all cylinders. Both magnetos separated from rear, left mag sparked with drill rotation. Right mag bent driveshaft, could not rotate. Oil filter damaged and could not be removed. Cut away a portion of filter can, element inspected and found clean. Oil suction screen clean. Oil present in oil sump. Boroscope inspection of all cylinders - unremarkable. Fuel servo installed. Fuel pump actuated - suction and compression observed at inlet and outlet ports. Fuel observed during actuation. Fuel inlet screen - clean. Flow divider separated from top of engine. Disassembled, diaphragm intact. All fuel nozzles removed and unobstructed. Spark plugs removed, all coloration normal operation, and normal wear pattern. All accessory drives rotated normally.



Figure 19. Engine after recovery (Source: Lycoming Engines).

Submitted by:

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