

National Transportation Safety Board

Office of Aviation Safety

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N829SH - AIRFRAME AND ENGINE EXAMINATION REPORT

May 1, 2024

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A. ACCIDENT

Location: Spring Branch, Texas
Date: April 29, 2024
Time: 1513 Central Time
Helicopter: N829SH, Vertical Aviation Technologies. Hummingbird 260L

B. N829SH - AIRFRAME AND ENGINE EXAMINATION REPORT

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C. DETAILS OF THE EXAMINATION

1.0 Onsite Examination

The investigative team arrived at the accident site on April 30, 2024. The accident site consisted of a grass yard in front of a house in Spring Branch, Texas. The front of the yard was populated with various small trees. The house sustained some damage from the impact sequence, but the home did not sustain any fire damage. There were no ground injuries.

Multiple witnesses observed or heard the helicopter and contacted the NTSB. The owner of the home, for where the helicopter came to rest, provided the investigative team with security camera footage. The investigative team reviewed the camera footage. The video showed the helicopter impact terrain in front of the home, and a postimpact explosion, and a fire occurred. The wreckage was consumed by the fire. The video showed the helicopter was structurally intact prior to impact with no evidence of an inflight fire. The helicopter was destroyed.



A search by NTSB air traffic control investigators did not reveal any Automatic Dependent Surveillance-Broadcast (ADS-B) data or Passur OpsVue data for the accident flight.

The wreckage came to rest, at one impact point, on a heading of about 33 degrees. The elevation of the accident site was about 1,250 ft above mean sea level.



Just prior to the impact point, and in relation to the flight path, three ground strikes from the main rotor blades were observed on the grass yard. Additionally, a tree strike with a main rotor blade was observed.

The wreckage was located about 33 feet from the front door of the home. All the helicopter's major structural components were located at the accident site.

The main rotor hub was found partially intact. The red and blue main rotor blades were found separated from the main rotor hub, about 45 feet away from the wreckage, on a heading of about 25 degrees. Most of the yellow main rotor blade remained attached to the main rotor hub. All the hardware for the main rotor hub appeared to be installed. The main rotor hub and the transmission were able to be rotated by hand with no issues noted.

The airframe data plate was not identified in the wreckage.

Most of the airframe was consumed by the fire. Partial flight control continuity was established in the cockpit for the two sets of flight controls. The two collectives, the two cyclics, and the two sets of tail rotor pedals all sustained fire and impact damage. Flight control continuity from the cockpit to the main rotor system could not be determined due to the fire damage. Flight control continuity from the cockpit to the tail boom and back to the tail rotor system was established. The tail boom was found separated from the fuselage.

Airframe to engine control continuity could not be established due to the fire and impact damage.

Multiple golf balls (some intact and some with fire damage) with markings were found located throughout the wreckage. Various diving weights were also found located throughout the wreckage.

The cockpit was destroyed by the fire, and no cockpit indications were able to be obtained.

Both seats and both seat restraint systems, for the pilot and the passenger, were destroyed.

An Appareo Stratus device and a Garmin D2 watch were removed from the wreckage and were shipped to the NTSB Vehicle Recorders Laboratory. Both items had fire and impact damage.

A fire damaged Apple iPad was found in the wreckage.

No bags or backpacks were found in the wreckage.

The airframe fuel system was destroyed. The helicopter was not equipped with a crashworthy fuel system, nor was it required to be by regulation.

An airframe fuel sample was not obtained.

No documents (such as the rotorcraft flight manual, the FAA airworthiness certificate, or the pilot's logbook) were observed in the wreckage.

The tail rotor system, which was partially intact, was found separated from the tail boom. The tail boom was found partially intact. Two control cables were found installed and intact on the top of the tail boom and terminated inside of the tail boom. The area where the two control cables terminated inside of the tail boom sustained impact damage in multiple locations.

All the hardware for the tail rotor hub appeared to be installed. Both tail rotor blades sustained impact damage and were found separated from the tail rotor hub. The tail rotor hub and the tail rotor gearbox were able to be rotated by hand with no issues noted. The tail rotor gearbox sustained impact damage and was found partially fractured.

The wheeled landing gear was found separated from the fuselage and was fractured in multiple areas.

An emergency locator transmitter was not observed in the wreckage.

No evidence of feathers or snarge was observed in the wreckage.

The engine mount was found fractured in multiple areas from impact damage.

The General Motors LS7 (V8, 7.0 liter) series automotive engine was found separated from the airframe, partially attached to the engine mount. Various areas on the engine that had stamp markings were documented.

The engine case was found intact; however, the oil sump had a hole present from fire damage. The various engine accessories all had extensive fire damage. The engine fuel system, engine oil system, engine cooling system, engine air induction system, engine ignition system, and engine exhaust were all destroyed from the fire and impact damage.

The engine computer was destroyed by the fire.

The engine crankshaft was rotated by hand confirming internal engine continuity. Due to the impact damage, full thumb compression could not be obtained.

All the ACDelco (model 12621258) automotive spark plugs were removed and were examined. All the spark plugs appeared to be in a normal condition, according to the Champion Aerospace Check-A-Plug Card AV-27.

The valve covers were removed. The engine rocker arms, valve springs, and associated hardware all appeared to be present and intact.

All cylinders were inspected with a borescope, and no issues were noted with the pistons.

A nitrous oxide bottle with fire damage was found in the wreckage.

An engine oil sample was not obtained.

An engine fuel sample was not obtained.

The investigative team spoke with the pilot's wife on April 30, 2024. She reported that the purpose of the Part 91 flight was to perform a charity golf ball drop at the River Crossing Club (a private gold club) in Spring Branch, Texas. The pilot, who is also the owner of the helicopter, had a pilot-rated passenger onboard the helicopter for the golf ball drop. She reported the pilot did not mention any mechanical concerns with the helicopter prior to the accident flight. She further reported that the helicopter did not have insurance coverage and the pilot had built a hangar on their property for the helicopter. The pilot was a retired U.S. Air Force pilot, who flew the Sikorsky MH-53 series helicopters. The pilot was also the builder of the experimental kit-built helicopter.

The wreckage was released to the pilot's wife. A friend of the pilot came and recovered the wreckage from the accident site.

The pilot's children reported they were unsure about the location of their father's pilot logbook, but reported that if they find it, they will share it with the NTSB. They reported that their father kept his pilot logbook with his Apple iPad at all times (a fire damaged Apple iPad was found in the wreckage).

The helicopter was based at the Kestrel Airpark (1T7), San Antonio, Texas. On May 1, 2024, the investigative team traveled to the hangar where the helicopter was based at. A large container of fuel that the pilot used for the helicopter was documented. The fuel in the container, and the inside areas of the container, appeared to be free from debris. Per a tenant at the airpark, the pilot had non-ethanol 91 octane automotive fuel in the container from a Valero fuel station in New Braunfels, Texas. A fuel sample was obtained from the container, which appeared to be free from debris. Water finding paste was inserted into the fuel sample, and the water finding paste did not change colors, indicating the lack of water presence in the fuel sample.

The NTSB IIC spoke with Brad Clark, who is the owner of Vertical Aviation Technologies, on the telephone, on May 1, 2024. Brad has known the accident pilot for the last 14 years approximately. Brad reported that the pilot had previously called him about ethanol fuel eating up his fuel bladder and causing fuel lines to clog. Brad offered to sell the pilot a new fuel bladder, but he never heard back from the pilot on the subject.

Brad reported that the pilot had installed a different computer system for the engine. The pilot had also installed a nitrous oxide system with the helicopter to likely increase performance, but Brad did not think that was a safe idea.

2.0 Maintenance Records Review

The pilot's children provided maintenance records to the investigative team for the airframe and the engine. The maintenance records terminated in the year 2018. The pilot's children were not sure where the maintenance records from 2018 to current were located, but reported that if they find them, they will share them with the NTSB. An undated weight and balance sheet in the maintenance records was documented.

The historical FAA airworthiness and registration records were retrieved and were reviewed.

Submitted by:

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Investigator-In-Charge