



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

DATE June 21, 2022

AIRFRAME AND ENGINE EXAMINATION

WPR20TA039

This document contains 9 embedded photos.

A. ACCIDENT

Location: Riverton, Utah

Date: 12/11/2019

Aircraft: Enstrom F28F / N65RS

NTSB IIC: Fabian Salazar

B. EXAMINATION PARTICIPANTS:

Name: William E. Taylor
Director of Engineering
Enstrom Helicopter Corporation
Menominee, Michigan

Name: Gordon Behunin
Federal Aviation Administration
Salt Lake City, Utah

Name: Paula Ann Behrend
Principle Avionics Inspector
Federal Aviation Administration
Salt Lake City, Utah

C. SUMMARY

The IIC did not travel to examine the wreckage. The Director of Engineering, Enstrom Helicopters, examined the airframe under the oversight of the FAA. The engine was not examined due to the pilot not complaining of an engine anomaly. Examination of the airframe was conducted at the owner's warehouse located at Riverton, Utah. Examination of the airframe revealed the left-side tail rotor control cable was fractured near the location of the tail rotor blades. No other preaccident mechanical malfunctions or failures were found that would have precluded normal operation.

D. DETAILS OF THE INVESTIGATION

Airframe Examination

The wreckage came to rest upright; the left skid gear was collapsed but the right gear was intact. The damaged main rotor blades had been removed by the owner with permission of the NTSB IIC. The Plexiglas in the left door, overhead window, and chin window was broken. The engine cowling and wraparound cowling on the left side were dented and wrinkled. The right side of the aircraft forward of the tail cone appeared to be unscathed. There were wrinkles in the forward bay of the tail cone on the left side.

The left horizontal stabilizer was bent upward and forward. The tail cone, from the stabilizers aft, was twisted slightly, bottom toward the right side of the aircraft. The tail rotor guard was broken off consistent with the tail moving to the left as it contacted an object. The fuel tanks were full or nearly full.

The tail rotor gearbox housing was broken across the gear interface, consistent with a severe ground strike while the tail rotor was turning. The input gear assembly was in the part that was still attached to the stinger tube and the output gear assembly, including the tail rotor assembly was in the half that left the aircraft. There were no broken teeth on either gear. Both the input and output assemblies turned freely in their housings. The control cable on the left side was separated and the cable on the right side was intact. Both cables were unbolted from the tail rotor controls. The owner reported that he disconnected both cables to simplify recovering the wreckage.

Both tail rotor blades were still attached to the hub, but they were damaged to the extent that the skins were separated from the spars. The bending was consistent with a severe ground strike while they were being driven. One of the blades had significant out-of-plane bending consistent with the aircraft rotating during the impact. The tail rotor control system from the cable attachments through the blades was intact and operated smoothly.

The tail rotor cable on the left side of the aircraft was separated. The separation was located roughly in line with the tip of the tail rotor blade. Superficially, the separation was consistent with being cut by a blunt object with relatively high energy, such as a tail rotor blade. There were marks on the tail rotor drive shaft that appeared to match the tail rotor cable. These marks would be consistent with a section of tail rotor cable having contacted the drive shaft while it was rotating. Except for the separation of this cable and the fact that both cables had been disconnected at the tail rotor control yoke, the tail rotor control system was continuous.

The cyclic and collective controls were continuous from the pilot controls through the lower swashplate.

All three main rotor blades exhibited upward bending at the blade grips, consistent with a severe ground strike. All three blades were bent upwards and exhibited opening up of the skin/spar joint.

The owner did not report a loss of engine power or a loss of drive. The drive system was continuous.

PHOTO EXHIBIT



Figure 1. N65RS, left-side view. Photo courtesy of the FAA.



Figure 2. N65RS, rear view. Photo courtesy of the FAA.



Figure 3. N65RS, right side view. Photo courtesy of the FAA.



Figure 4. N65RS, front view. Photo courtesy of the FAA.



Figure 5. Main rotor blades from N65RS. Photo courtesy of the FAA.



Figure 6. Tail rotor assembly. Photo courtesy of the FAA.



Figure 7. View of the damaged area of the tailboom bear the location of the tail rotor blades. Photo courtesy of the pilot.



Figure 8. Tree located near the wreckage, showing broken branches. Photo courtesy of the FAA.



Figure 9. Left-side tail rotor control cable, showing the fracture. Photo courtesy of the airframe manufacturer.