

National Transportation Safety Board

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AIRWORTHINESS

Specialist's Field Notes

August 8, 2024

A ACCIDENT

Location: Belleville, West Virginia
Date: March 18, 2024
Time: 1720 eastern daylight time
Helicopter: MD Helicopters 369D

B AIRWORTHINESS SPECIALIST

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C SUMMARY

On March 18, 2024, about 1720 eastern daylight time, a Hughes 369D, N102SU, was substantially damaged when it was involved in an accident near Belleville, West Virginia. The commercial pilot was seriously injured. The helicopter was operated as a Title 14 Code of Federal Regulations Part 133 rotorcraft external load flight.

According to the pilot, he was conducting tree trimming operations and previously completed several flights throughout the day with no abnormalities noted. During the accident flight, while trimming trees northbound above a creek, the pilot encountered some challenges with encroaching tree limbs. The pilot was assessing the feasibility of cutting the tree line safely, when he heard a loud "boom", which was followed by the helicopter entering a rapid descent. He maneuvered toward smaller trees to minimize the impact. He briefly lowered the collective to preserve rotor rpm, and then raised the collective just before impact. The pilot said he intentionally did not release the cutting saw, hoping it would aid in cushioning the impact.

D DETAILS OF THE EXAMINATION

On August 8, 2024, representatives from the NTSB and MD Helicopters examined the clutch subassembly, engine-to-transmission (Kaflex) drive shaft, and the transmission input coupling at MD Helicopters.

The Kaflex driveshaft was P/N E500N5215 and S/N KAM1-072. The driveshaft was intact with no evidence of cracks or fractures. All torque striping between the shaft and Kaflex couplings on both ends were present except for one nut where remnant torque stripe was observed but the majority of the stripe had separated from the hardware. The main transmission input coupling, P/N AM369H5660 and S/N 2145, had no evidence of anomalous damage. The splined connection showed no evidence of wear or missing teeth. Remnant grease was present on the splines.

The clutch subassembly was P/N 369A5350-41 and S/N 7615. The clutch functionality was confirmed via rotating the clutch inner race in the drive and freewheeling directions while holding the clutch outer race static. The input-side splines, which mates to the engine gearbox, showed no evidence of anomalous wear or fractured teeth. Remnant grease was present on the splines. On the output side of the clutch subassembly, the coupling was S/N 2141. The outer race of the clutch subassembly was S/N 1690. The output bearing remained installed within the bearing carrier and had grease present within the bearing. The grease had a dark coloration. When the output bearing, spacers, and bearing carrier were removed using an arbor press, the output bearing shield came out of the bearing. Oil within the clutch was drained into a cup and the quantity was about 27mL. The fluid had a dark coloration but did not smell acrid. Metallic particles were not seen within the drained fluid. (Note: the minimum allowable quantity is 13 cc and the servicing capacity is 30 cc.) The output splines did not have any anomalous wear or evidence of cracks. The sprags did not have anomalous damage that would preclude its operation. The two bearings, on each side of the sprag assembly, rotated smoothly and did not exhibit seizure.

E FIGURES



Figure 1. The Kaflex driveshaft.



Figure 2. The main transmission input coupling.



Figure 3. The overrunning clutch subassembly.



Figure 4. The output splines of the clutch subassembly.



Figure 5. The output bearing and lower bearing carriers. (Tool to remove the output bearing is installed in this photo.)



Figure 6. The sprag assembly.

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