

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN24FA298

EXAMINATION SUMMARY

August 29, 2024

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A. ACCIDENT

Location: Napoleon, Michigan
Date: August 3, 2024
Time: 2058 CDT

Gyroplane: N140DG, DeGraw DeBird

B. EXAMINATION SUMMARY

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C. SUMMARY

On August 3, 2024, about 2058 central daylight time, a De Bird gyroplane, N140DG, was substantially damaged during an accident near Napoleon, Michigan. The pilot was fatally injured. The gyroplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site

The gyroplane was located in a wooded area to the left of a turf runway on a private airstrip owned by the pilot and her husband. The location of the main wreckage was about 200 feet left of the runway centerline and 250 ft. short of the runway's departure end.



Figure 1. Google Earth image of the accident area.

2.0 Airframe Examination

The gyroplane was upright but leaning to its left side and was supported by trees. There was crushing of the forward and left side of the fuselage. The left main landing gear was fractured.



Figure 2. The entire Gyroplane at the accident site.

The horizontal and fixed vertical tail surfaces were found a short distance away from the fuselage on opposite sides of surrounding trees. The location of the tail surfaces at the accident site was consistent with separation before the gyroplane descended into the trees. The tail surfaces had two separate areas of damage with features consistent with having been impacted by the main rotor. Examination of the main rotor blades revealed yellow paint transfer that was also consistent with the main rotor impacting the tail of the gyroplane. The tail boom of the gyroplane was partially separated from the fuselage and only remained attached by the two rudder cables. The fracture of the tail boom was consistent with the aft end of the boom bending toward the right prior to failure. This was consistent with a potential rotor strike to the tail considering the counterclockwise rotation direction of the main rotor blades as viewed from above.



Figure 3. The gyroplane's tail surfaces with rotor impact mark.



Figure 4. Tail surfaces and tail boom placed in pre-impact location.

The accident gyroplane flight control system consisted of a cyclic control and a collective control which adjusted the main rotor blade pitch dependent on the blade location while rotating. The directional control was accomplished by a single moveable vertical surface below the horizontal stabilizer and between the two fixed vertical stabilizers. Examination of the gyroplanes control system confirmed continuity of the cyclic, collective, and directional control systems. All identified breaks were consistent with impact damage.

The rotor drive system was intact except for a separation of the drive coupling in the top of the fuselage (Figure 5). All three main rotor blades were intact from root to tip but with bending at various locations along their length due to impact. All of the main rotor system components were intact with all damage consistent with impact damage.



Figure 5. Failed rotor drive coupling.



Figure 6. Rotor head.

3.0 Engine Examination

Examination of the gyroplanes engine was limited but continuity of the reciprocating and valve train system was verified by rotating the engine. During rotation, compression could be felt on all cylinders. No preimpact anomalies were found during the examination.



Figure 7. Engine during examination.

4.0 Pilot Information

The pilot's husband did not have her flight logbooks available, but said that she had about 800 flight hours in the accident gyrocopter.

5.0 Aircraft Information

The pilot's husband was at the property during the examination. After the examination he was able to show us a similar gyroplane that was larger than the accident gyroplane but operated the same.

The accident gyroplane was an original concept that was designed and constructed by the pilot's husband. It had several unique features that distinguished it from more common gyroplanes. A portion of the engine's power is continuously supplied to drive the main rotor system which has cyclic and collective control of the rotor system. Yaw control is by a moveable vertical tail surface. The gyroplane was capable of performing "Jump" takeoff where the gyro would ascend vertically from a standstill before transitioning to forward flight.

He reported that his wife was conducting an evening pleasure flight in the gyroplane. He said that the weather conditions at the time of the accident were good and that his wife was very experienced in the accident gyroplane. He was about ¼ mile away from their private airstrip and he could hear the gyroplane as it advanced down the runway, took off, and began its climb. He said that he did not hear anything unusual until he heard two loud thumps. He noted that during a normal takeoff the gyroplane would be about 150 ft above ground level (agl) when it reached the departure end of the runway. After hearing the thump noises, he boarded and took off in another gyroplane that he owned to search for the accident gyroplane but could not locate it. When asked if he heard any unusual engine sounds, he said that he could not be sure as the gyroplane was farther away after starting the takeoff.

6.0 Meteorological Information

The nearest weather reporting station was the Jackson County Airport (JXN), Jackson, Michigan, located about 11 nautical miles northwest of the accident site. About the time of the accident JXN was reporting:

KJXN 040056Z 34004KT 10SM FEW050 26/19 A2993 RMK AO2 SLP128
T02560194

Submitted by:

John Brannen
NTSB IIC