

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



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WRECKAGE EXAMINATION REPORT

April 22, 2024

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A. ACCIDENT

Location: Tavernier, FL
Date: 03/24/2024
Time: 1410 EDT

Gyroplane: Autogyro MTO Sport

B. WRECKAGE EXAMINATION REPORT

Investigator	Kurt Gibson NTSB Washington, D.C.
Technical Advisor	Jordan Paskevich BRP-Rotax GmbH Vernon B.C, Canada
Party Coordinator	Juan Garcia FAA Miami, FL

C. SUMMARY

The wreckage was examined on 04/15/2024 after it had been recovered to the owner's hangar at the Tavernaero Park Airport (FA81), Tavernier, FL. There were no preaccident anomalies or mechanical failures observed that would have precluded normal operation of the gyroplane.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

The fuselage near the front seat had buckled on both the left and right side of the fuselage and the fuselage had buckled on the right side near the rear seat. The rotor head assembly had impact separated from the rest of the airframe and one of the rotor blades had impact separated from the rotor head assembly. The other rotor blade had been removed from the rotor head assembly before the examination by the NTSB. The empennage sustained substantial damage; the horizontal stabilizer, vertical stabilizers, and the rudder had impact separated from the gyroplane and were not observed during the examination. The nose landing gear had impact separated from the aircraft, the main landing gear assemblies remained attached to

their respective attach points and were undamaged. The gyroplane was equipped with four-point harnesses for both seats. Both harnesses were undamaged and remained attached to their attach points.

Flight control continuity was established for all of the flight controls through breaks that were consistent with impact damage. The throttle and choke control were continuous from the cockpit to both carburetors. The airframe fuel system remained intact and there were no loose or broken fuel lines observed. The electrically driven fuel pumps were powered on using the gyroplane's electrical system and both of the fuel pumps operated normally.



Figure 1: Left side of the gyroplane



Figure 2: Right side of the gyroplane



Figure 3: Instrument panel



Figure 4: Rotor head assembly

2.0 Engine Examination

The gyroplane was equipped with a Rotax 914 UL engine, which is a carbureted, 4-cylinder, turbocharged engine that had a maximum takeoff power of 115 horsepower for 5 minutes. The engine remained attached to the airframe through the engine mounts, hoses, wires, and cables. It was noted that the engine had been pushed towards the front of the gyroplane, consistent with the observed

impact damage. Attempts to rotate the crankshaft by manually rotating the propeller hub were unsuccessful. The gearbox assembly was removed, and it was noted that the gearbox gears and propeller drive shaft were intact and displayed normal operating and lubrication signatures. The propeller shaft could rotate normally in its bearings. The crankshaft was manually rotated, and it was noted that there was binding in the crankshaft. According to the technical advisor for Rotax, the binding was consistent with the crankshaft being out of round from a propeller strike during engine operation. During crankshaft rotation, it was noted that all four cylinders displayed good thumb compression and suction and all the overhead components (valves, springs, and rocker arms) operated normally. The cylinder heads and cylinder sleeves were removed, and the internal components were visually examined. The cylinder heads and cylinder sleeves displayed normal operating signatures and there were no signs of scoring or damage to the cylinders that would indicate a coolant failure. The valve heads displayed normal operating and combustion signatures. The pistons displayed normal operating and combustion signatures and all of the piston rings were free to move in their grooves. The connecting rods remained attached to their respective crankshaft journals and displayed normal operating and lubrication signatures. The visible portions of the crankshaft and camshaft displayed normal operating and lubrication signatures.

Both carburetors remained attached to the engine and were undamaged; however, the throttle control arm and cable of the carburetor on the right side of the gyrocopter (carburetor B) was impinged against the airframe which was consistent with the observed impact damage. The throttle valve of carburetor A operated normally during actuation. The throttle valve of carburetor B was stuck in the full open position which was consistent with the impact damage observed to the carburetor. There were no signs of fuel or intake leaks around the carburetors. The carburetor bowls were removed from both carburetors and visually examined. Both carburetor bowls contained fuel that was consistent with automotive gasoline. There were no signs of water or debris contamination within the carburetor bowls. The carburetor floats remained intact and displayed normal operating signatures.

The engine was equipped with an electronic ignition system which could not be tested during the examination. All eight of the ignition leads were intact and were secure to the electronic ignition system and to each of their respective spark plugs. The spark plug electrodes were visually examined and the spark plug electrodes displayed normal operating and wear signatures.

The engine was equipped with a turbocharger, which remained attached to its installation point and was undamaged. The compressor blades were undamaged and displayed normal operating signatures. The turbocharger shaft was rotated and it was noted to rotate without any signs of binding. The wastegate remained secure and the wastegate controller cable remained attached to the wastegate and to the turbocharger controller. The turbocharger controller was activated by turning on the gyroplane's electrical system and it was noted that the controller was capable of actuating the wastegate valve normally.

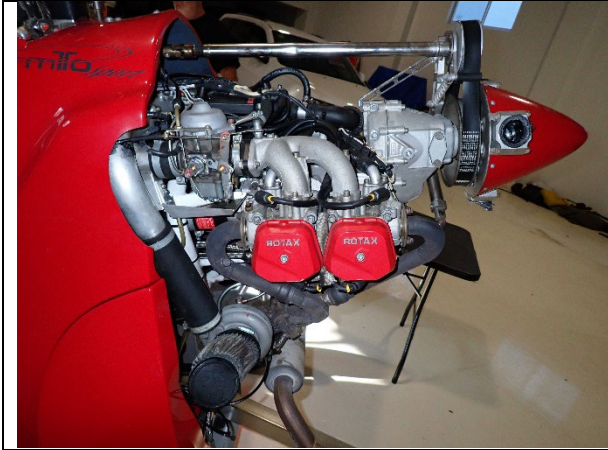


Figure 5: The engine when viewed on the left side of the gyroplane

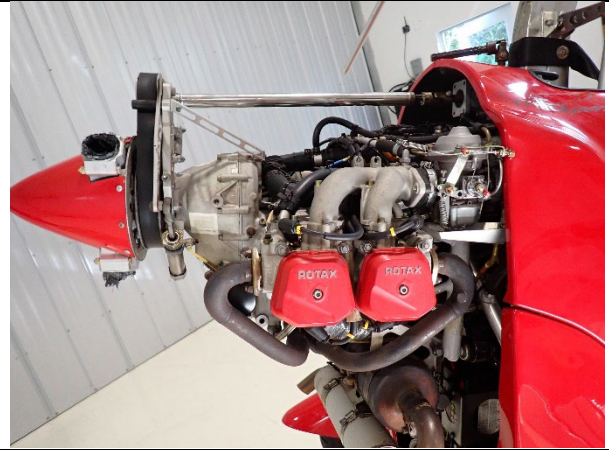


Figure 6: The engine when viewed on the right side of the gyroplane



Figure 7: Carburetor "A" bowl and floats with fuel



Figure 8: Carburetor "B" bowl and floats with fuel

3.0 Propeller Examination

The three-blade, fixed-pitch propeller remained attached to the propeller drive shaft. All three of the propeller blades had sheered near the hub which was consistent with impact damage. The separated portions of the propeller blades were not observed at the time of the examination.



Figure 9: Propeller spinner and hub



Figure 10: Propeller spinner and hub

Submitted by:

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Aviation Accident Investigator