

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA257

EXAMINATION SUMMARY

June 25, 2023

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. PARTICIPANTS.....	3
C. ACCIDENT SUMMARY.....	3
D. EXAMINATION SUMMARY	4
1.0 ACCIDENT SITE	4
2.0 AIRFRAME EXAMINATION.....	4
3.0 ENGINE EXAMINATION	6
4.0 PROPELLER EXAMINATION	6

A. ACCIDENT

Location: Beaver Island, Michigan
Date: June 23, 2023
Time: 0844 eastern daylight time
Aircraft: Avid Magnum, N103DG

B. PARTICIPANTS

Investigator-in-Charge (IIC) Zane Brown
Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Investigator Timothy Sorensen
Aviation Accident Investigator
National Transportation Safety Board
Denver, Colorado

Party Representative Michael Mathews
Principal Maintenance Inspector
Federal Aviation Administration
Grand Rapids, Michigan

Party Representative Troy Helgeson
Air Safety Investigator
Lycoming Engines
Williamsport, Pennsylvania

C. ACCIDENT SUMMARY

On June 23, 2023, about 0844 eastern daylight time, airplane, an Avid Magnum airplane, N103DG, was substantially damaged when it was involved in an accident near Beaver Island, Michigan. The pilot sustained serious injuries. The passenger was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Post-recovery airframe and engine examinations were conducted on June 25, 2023, at Welke Airport (Beaver Island, Michigan) by the NTSB investigator-in-charge with the assistance of the FAA and a technical representative of Lycoming Engines.

D. EXAMINATION SUMMARY

1.0 Accident Site

The accident site was located in Lake Michigan about 3.25 miles northwest of the Beaver Island shoreline. Approximate accident site coordinates were 45.7955 latitude / -85.6095 longitude. The airplane came to rest in about 20 feet of water. The floats were separated and recovered about 250 yards from the main wreckage.

2.0 Airframe Examination¹

Avid Magnum (s/n 6M)

The engine mount was fractured adjacent to the upper right mount. It appeared otherwise intact. The mount was securely attached to the firewall. The fuselage structure exhibited localized deformation/damage but appeared otherwise intact. Both wings remained secured to the fuselage at each attachment point. The windshield was broken out consistent with impact. The instrument panel was dislocated slightly but otherwise intact.

The airplane was equipped with a standard (analog) airspeed indicator, altimeter, vertical speed indicator, and turn coordinator. The Altimeter was set to 29.78 InHg in the Kollsman window. A mount for a handheld GPS or cellphone was attached to the instrument panel in front of the left (pilot) seat. The mount was empty at the time of the post-recovery examination.²

The cockpit control sticks remained securely attached to the pivot points on the cockpit floor. The rudder pedals appeared intact. They were secured to the torque tubes, and the torques to the cockpit floor. The rudder cables were securely attached to the rudder pedals.

The left wing was dislocated aft but remained attached to the fuselage at the wing root attachment points. The wing spars were intact. The wing struts remained attached to the fuselage and the wing attachments. The struts were deformed consistent with impact forces. Portions of the wing fabric was torn, and multiple ribs were damaged. The fuel tank appeared intact and was full of fluid. The fluid exhibited a faint aviation fuel odor. The fuel cap was installed. The fuel cap vent was clear.

The left flaperon was separated at each hinge point and not recovered with the wreckage. The flaperon torque tube was fractured at the root consistent with overload.

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

² A GPS or cellphone was not found in the aircraft at the time of the post-recovery examination.

The right wing was dislocated forward, inline with the left wing, and remained attached to the fuselage the wing root attachment points. The wing struts remained attached to the fuselage and the wing attachments. The forward strut exhibited a minor bend; the remainder of the right struts appeared intact and undamaged.

The right flaperon was separated at each hinge point and recovered with the wreckage. The control surface was damaged at the root and near mid-span. The wing root torque tube remained attached to the flaperon. The mating rod end was securely attached; however, the threaded portion was bent and fractured consistent with bending overload.

Flaperon control continuity was confirmed from each control cockpit control stick to the left and right push-pull tubes.

The left horizontal stabilizer was separated at the root consistent with impact overload. The left strut was separated at the inboard end; the fracture surface appeared consistent with impact overload. The outboard end remained secured to the stabilizer. The right horizontal stabilizer was dislocated downward and remained attached. The strut was bent but remained secured to the aft fuselage and the stabilizer.

The vertical stabilizer remained attached to the aft fuselage. The upper portion of the stabilizer was bent to the right and the fabric was damaged. Rudder remained attached to the vertical stabilizer at each hinge point. The rudder was bent to the right consistent with the deformation to the vertical stabilizer. The rudder bellcrank remained attached to the control surface. The ground-adjustable rudder trim tab remained attached and was secure.

The elevator remained attached to the horizontal stabilizer at each hinge point. The elevator torque tube was separated at the airframe centerline consistent with impact overload. The elevator trim tab remained attached to the left elevator. The trim tab was separated at the connecting rod consistent with impact. The electric trim actuator appeared intact. The trim tab was positioned about 5.4° trailing edge down.

Elevator control continuity was confirmed from each cockpit control stick to the control surface. The aft fuselage bellcrank was intact. The push-pull tube from the bellcrank to the elevator was bent but otherwise intact and securely attached.

The floats were separated from the fuselage. The mounting strut fracture surfaces appeared consistent with impact overload. The left float was deformed upward over the forward 5 feet of the float. The forward 2-foot portion of the left float was separated and fragmented. The forward 5-foot portion of the right float was damaged and partially separated.

3.0 Engine Examination

Lycoming O-320-H2AD (s/n L-1677-76)

Mechanical continuity was established throughout the rotating group, valve train and accessory section during hand rotation of the crankshaft. The lower spark plugs were removed and thumb compression and suction was obtained on all 4 cylinders. Valve covers were removed, and valve train continuity was observed on all cylinders with appropriate movement of the rocker arms and valves.

Top spark plugs were removed and all 8 plugs were examined according to the *Champion AV6-R* manual, all plugs were determined to be normal electrode condition. The ignition harnesses were attached from the magneto to their respective spark plugs, with impact damage noted. The magneto was secured to its respective mounting pad. The single drive dual magneto was removed and produced spark on all leads when rotated by hand.

Throttle, Mixture, and Carb Heat controls were attached to their respective locations and moved free and correct.

The spin-on oil filter was removed, and cut open for examination, and was found be unremarkable the oil filter was dated 11 May 22 with a tach time of 1461. The oil was drained from the sump and about 6 quarts of oil and about 10 quarts of water was observed.

A borescope exam of the cylinders revealed no abnormalities of note.

The carburetor was intact and undamaged. The fuel screen was removed from the carburetor and had no occlusions. The fuel bowl was drained and a clear liquid with the odor of fuel was observed.

No occlusions were noted in the mufflers or exhaust tubing. The foam intake air filter was clean, and no obstruction was noted in the induction system.

4.0 Propeller Examination

McCauley 1A175 (s/n TA023)

The propeller remained securely attached to the engine propeller flange. One propeller blade was bent forward over the outboard approximate one-quarter span. The outboard 9-inch portion of the blade was separated. The second blade exhibited leading edge gouging and chordwise scratches.

----- end of summary -----