

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24FA058

WRECKAGE EXAMINATION

December 11-13, 2023

A. ACCIDENT

Location: Pulaski, Tennessee @ 35.249998° -86.848157°
Date: December 7, 2023
Time: 1103 CST
1703 Z
Airplane: Beech "Debonaire" BE 35-C33 N5891J

B. WRECKAGE EXAMINATION

IIC Aaron McCarter
NTSB
Washington DC

Textron Party Investigator Jennifer Barclay
Textron/Beech
Wichita, Kansas

FAA ASI David Lewis
FAA Nashville FSDO
Nashville, Tennessee

C. SUMMARY

On December 7, 2023, at 1103 central standard time, a Beech 35-C33, N5891J, was destroyed when it was involved in an accident near Pulaski, Tennessee. The private pilot and passenger sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site

Foothills near Pulaski, TN. Steep terrain on a 18° slope. The airplane struck hilly wooded terrain, at an elevation of about 962 ft with the wreckage path oriented on a magnetic heading of about 290°. The wreckage was highly fragmented. The debris field extended out in a fan-like pattern about 250 feet from the primary terrain impact site which was a crater about 5-feet deep by 8-feet wide. It was a high energy impact. The tops of 6-8 trees leading up to the main wreckage were cut off at progressively lower heights. There was a post-crash fire and subsequent brush fire covering about

2 acres.



Figure 1 Photo taken by IIC from impact crater looking up the hill at the wreckage path.

2.0 Airframe Examination

The airframe was 80% destroyed by impact and post impact fire. Fire was more pronounced on the left side of the airplane where the fuel tank in the left wing was compromised during impact with trees before it impacted the ground.



Figure 2. Wreckage layout looking from nose to tail.

2.1 Fuselage and Flight Control System

The fuselage was severely fragmented and had post impact thermal damage. All seats consumed by fire except for the pilot's seat where only the backing remained. The other 3 seat frames were deformed and missing the padding.

The flight control system components from the cockpit to all control surfaces were significantly damaged or destroyed by impact forces and the post-impact fire. Flight control continuity could not be established; however, all observed breaks of the flight control cables displayed fracture features that were indicative of tensile overload.

2.2 Empennage

Empennage was the only piece of wreckage that survived the impact although severely damaged by impact. The rudder and vertical stabilizer remained attached. All control cables leading up to the flight controls overloaded by impact. The left stab and elevator remained attached, and the control surface moved freely when manually manipulated. The trim on the left elevator that separated during impact was measured, indicating a 5° trim tab down. The autopilot servos were impact and thermally damaged.



Figure 3. Rudder/Vert Stab horizontal on hangar floor.

2.3 Wings

Left wing damaged by impact forms and fragmented. The left wing was exposed to the most intense fire due to thermal damage when compared to the opposing wing. The left aileron detached during impact and was crushed. The right wing was highly fragmented. Numerous pieces of wing and control surfaces from the left and the right exhibited half-moon shape crush marks due to impact with trees. One flap actuator was found loose in the wreckage but could not be attributed to the right or left side. It measured 1.7" which equates to flaps retracted.



Figure 4. Right wing looking towards fuselage.

2.4 Landing Gear

All 3-landing gear separated from the wreckage and were severely damaged by impact forces. The landing gear selector and actuators were damaged by impact forces and fire, and the setting could not be confirmed.

2.5 Cockpit

There was extreme damage to the instrument panel. All gauges and instrumentation were severely damaged, and the readings/settings could not be determined. There were no survivable displays or gauges. The Century 2000 autopilot faceplate was discovered in the wreckage. After cleaning, the buttons/settings could not be determined. The flight controls were fragmented. The

cockpit was destroyed by impact forces and fire, and no flight instrumentation or gauges could be accurately identified or recovered. All avionics were impact damaged and were exposed to post crash fire; There was no recorded (nonvolatile) memory that could be downloaded.



Figure 5: Century 2000 AP control panel after cleaning.

2.6 Fuel/Fuel System

The fuel tanks were compromised by impact forces and a post impact fire. Both tanks ruptured on impact, with significant fire in the wreckage and in the surrounding area. There was a strong smell of a fuel-fed fire at the scene. Fuel lines leading to the engine were damaged and all lines from fuel tank damaged by fire and were impact damaged. The fuel strainer screen was not observed on-site or in the recovered wreckage. The fuel strainer bowl was impact damaged but appeared clean. The fuel selector handle in the cockpit was not observed; however, the fuel selector valve was selected to the Left tank. One fuel cap was observed closed and secured to the filler port which separated from the left wing. The remainder of the fuel system was destroyed by impact forces and the post-crash fire.

2.7 Other Systems

Exhaust/Manifold and Muffler with Heater Shroud were crushed nearly flat, however the heater shroud appeared to be new. It was shiny and had no pitting, rust or pre impact damage that was observed.

Two (2) Video recording devices discovered on scene and were sent to the NTSB RE-40 lab for examination and possible download.

3.0 Engine Examination

The engine was a Continental IO-470-N with 260 horsepower. The engine was discovered partially buried in the impact crater. Compression, suction and valvetrain continuity were unable to be performed due to impact damage on the case and cylinders. Impact forces damaged the cylinders exposing the valve covers, rocker arms, and pushrods. The right side of the engine sustained the most impact damage displacing the cylinders aft.



Figure 6. Engine views.

The magneto key was broken off in the switch and set on "Both."

Both magnetos separated from the engine during the accident sequence and were damaged by impact forces and could not be functionally tested.

The spark plugs were impact damaged but showed minimal wear when compared to the Champion Check-A-Plug chart and did not display any evidence of carbon or lead fouling.

Maintenance logbooks were requested at the time of the examination.



Figure 7. Left and Right Magnetos



Figure 8. Mag key switch set to both.

4.0 Propeller Examination

The metal 2 blade McCauley propeller (2A36C23-DCE / Serial # 652954) separated from the flange and hub at impact. One blade was buried in the impact crater and exhibited an s-bend with chordwise scraping and leading-edge gouges with 6 inches of the blade tip missing. The opposing blade was discovered about 30 feet west of the crater and had a slight bend with chordwise scraping and leading-edge damage.



Figure 9. Propeller damage.

5.0 Airworthiness

A review of the aircraft's airworthiness file found the following repairs or alterations had been accomplished:

Date Description 01-05-23 Removed Bendix King Nav/Comm KX155. Installed Garmin GNC 355 per STC SA02636SE

04-29-22 Installed two small patches on either side of cheek cowl skin from Fuselage Station (FS) 12.125 to FS 49

03-16-13 Installed Aviation Research Systems Inc. battery box per STC SA00423SE

05-03-12 BAS, Inc. shoulder harnesses installed per STC SA1085SE

01-09-12 Installed Door Steward door assist gas spring modification per STC SA01120SE

10-08-10 GAMI fuel injectors kit installed per STC SE09217SC

03-05-02 Replaced windshield with FAA PMA windshield manufactured by L.P. Aero per D'Shannon Beech mods and DER engineering report 0012.

03-23-01 Modified aircraft in accordance with Beryl D'Shannon Aviation Specialties, Inc. per STC SA930SO by replacing the left and right wing tip assemblies; added a Whelen combination tail strobe and position light.

02-01-01 Modified engine in accordance with STC SE09217SC by the removal of six TCM fuel nozzles; installed GAMI injectors Kit No. GAD12D

04-17-00 Replaced IO-470-K engine with IO-470-N engine per STC SA3734NM; installed air baffle kit per STC SA01165CH; installed JPI Model 701 series monitoring system.

10-29-99 Installed rudder hinge brackets per STC SA00044LA 11-09-93 Removed Aerosonic encoding altimeter; installed United altimeter and Ameri-King encoder.

02-10-92 Installed Brackett air filter per STC SA71GL 07-11-90 ST-400 intercom system installed 12-10-81 Installed RaJay turbocharger per STC SE25WE

01-22-73 Narco ELT-10 installed 07-19-76 Avionics changes 07-24-68 Installed Delta Sky strobe light Model 7000 at FS 111