



## MEMORANDUM FOR RECORD

**Todd Gunther**  
**Air Safety Investigator**  
**Eastern Region**

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**Date: 04/10/2023**  
**Subject: Wreckage Examination**  
**NTSB Case Number: ERA23FA181**

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On April 10, 2023, the wreckage of N635BD was examined at Florida Air Recovery, Fort Pierce, Florida.

The following information was gathered from the examination:

### Airframe

During the examination, all major airplane components and control surfaces were identified, except for the right wing, right, aileron, right flap, sections of the main fuselage and parts of the aircraft fuel system.

The fuselage had been destroyed by impact; the top portion of the cabin and right wing were not recovered. The left wing was impact separated, and the empennage was impact separated approximately 12 feet from the rear of the airplane. The two rear seats and one seat back that were recovered were impact separated.

The rudder pedal cables had remained attached to the rudder bar and had separated at the rear cabin separation area. The left rudder cable had separated at the turnbuckle. The right rudder cable displayed evidence of tensile overload.

Both stabilator control cables were attached at the T-bar and were separated at the rear cabin area. The rear stabilator control cable displayed evidence of tensile overload, and the forward stabilator control cable was separated at the turnbuckle.

The aileron control chain was separated from its sprockets. Both cables remain attached to the aileron control chain and had separated in the main cabin area. The separation areas displayed evidence of tensile overload. The ELT was in the arm-position.

Examination of the vacuum powered attitude indicator revealed that the gyro was in place, would rotate, and displayed evidence of rotational scoring. Examination of the electric powered turn

and bank indicator also revealed that the gyro had remained in place and rotational scoring was evident.

Flight control continuity was established from all primary flight control surfaces (except the right aileron) to the control column and rudder pedals except for impact and recovery related separations.

The left wing was separated from the fuselage and exhibited outboard leading-edge damage. The flap remained in place and the aileron inboard section remained attached to the inboard hinge. Aileron continuity was established from the inboard aileron section to the wing root. Both cables separations at the wing root displayed evidence of tensile overload. The pitot mast was field tested with low pressure air and was free from blockage. The inboard fuel tank finger screen was free from blockage.

The vertical fin and rudder remained attached to the empennage, and rudder continuity was established from the rudder to the empennage separation area. The right rudder cable separation displayed evidence of tensile overload, and the left rudder cable was separated at the turnbuckle.

The stabilator was twisted counterclockwise from the airframe. Stabilator continuity was established from the stabilator to the empennage separation area. The top stabilator cable was separated at the turnbuckle and the bottom displayed tensile overload. The stabilator trim jack screw displayed 8 threads (1-inch) which was consistent with a neutral to nose up trim position.

### Propeller and Engine

Examination of the propeller and engine revealed that the two bladed propeller had remained attached to the engine. Both blades were bent and twisted towards the face side. One blade (the "B" blade) exhibited leading-edge gouging on the outboard portion of the blade, consistent with propeller rotation impacting the number three cylinder during the airplane impact sequence.

The six-cylinder Lycoming engine incurred impact and water damage. The recovery team filled the engine with diesel fuel for preservation after recovery.

Valve train and gear train components were found to operate during hand crankshaft rotation. Thumb compression and suction was produced in all cylinders. Fuel was found in the fuel servo and in the inlet fuel line. The oil finger screen and oil filter element were all free from blockage.

The engine driven fuel pump was manually field tested and was operational. The cable ends of the mixture, throttle, and propeller governor had all remained attached to their respective components.

Both magnetos were water damaged but produced spark during rotation. The Engine driven vacuum pump was functional and air pressure and suction was felt through its respective ports when rotated. The electric powered auxiliary vacuum pump when powered initially rotated but then jammed. The pump was disassembled and was found to be contaminated with sand.

During the examinations, no evidence of any preimpact failures or malfunctions of the airplane, propeller, or engine were discovered.