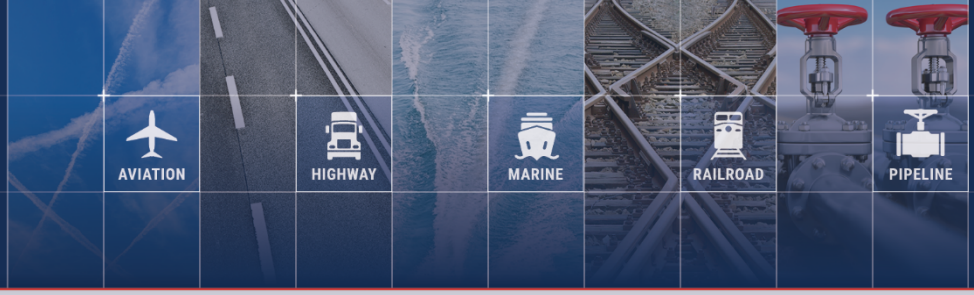


# Aviation Investigation Final Report

| | | | |
|---|---|---|---|
| **Location:** | Patriot, Indiana | **Accident Number:** | CEN18FA282 |
| **Date & Time:** | July 19, 2018, 17:00 Local | **Registration:** | N228LC |
| **Aircraft:** | Fisher Celebrity | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | Aircraft structural failure | **Injuries:** | 1 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The airline transport pilot was conducting a personal flight in his recently-purchased experimental, amateur-built biplane when the airplane experienced an in-flight breakup and subsequently impacted a cornfield. There were no witnesses to the accident. The upper and lower left wings were attached to each other but were separated from the fuselage. Part of the lower right wing was located with the wreckage but not attached to the fuselage. Additional parts of the upper and lower right wings were found scattered throughout an area between 400 yards to 800 yards west of the impact area, and other parts of the wings were found about 80 yards from the wreckage; however, the majority of the wing structure was not found.

The right wing attachment fittings displayed fractures intersecting the inboard wing spar attachment bolt hole. The fracture features for each attachment fitting were rough and matte gray in appearance, consistent with ductile overstress fracture and with upward bending of the wing at the attachment location. The outboard end of the attachment fitting piece for the aft spar was also bent aft relative to the inboard end, consistent with the entire upper and lower right wings folding upward and rearward, bending and separating from the airplane. Because this airplane is a biplane, the upward bending of the lower wing attachment was secondary to a primary failure elsewhere, the location of which could not be determined due to the fact that a majority of the wing structure was unrecovered. There was no evidence of any preexisting damage on the wing spar attachment fittings.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An in-flight separation of the right wing due to upward and rearward bending that led to an overstress fracture. The reason for the upward and rearward bending could not be determined

based on the available information.

## Findings

| | |
|---|---|
| **Aircraft** | Attach fittings (on wing) - Failure |

# Factual Information

## History of Flight

| | |
|---|---|
| **Enroute-cruise** | Aircraft structural failure (Defining event) |
| **Enroute-cruise** | Part(s) separation from AC |
| **Uncontrolled descent** | Collision with terr/obj (non-CFIT) |

On July 19, 2018, about 1700 eastern daylight time, an experimental amateur-built Fisher Celebrity biplane, N228LC, experienced an in-flight breakup and impacted terrain near Patriot, Indiana. The airline pilot was fatally injured, and the airplane was destroyed. The airplane was privately owned and was being operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed in the area at the time of the accident, and no flight plan was filed for the local flight that originated from the pilot's personal airstrip in Warsaw, Kentucky, shortly before the accident.

When the pilot failed to return home as expected, his wife notified authorities. The wreckage was located the following morning about 0930 in a cornfield on the west side of the Ohio River, about 4 miles due east of the pilot's airstrip.

There were no witnesses to the accident; however, a nearby resident, who lived along the straight-line course between the pilot's airstrip and the accident site, stated that he heard an airplane fly over his house about 1700. Shortly thereafter, he heard a loud "thud."

## Pilot Information

| | | | |
|---|---|---|---|
| **Certificate:** | Airline transport; Commercial; Flight engineer | **Age:** | 67,Male |
| **Airplane Rating(s):** | Single-engine land; Multi-engine land | **Seat Occupied:** | Front |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 4-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | Yes |
| **Medical Certification:** | BasicMed | **Last FAA Medical Exam:** | April 20, 2018 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 15020 hours (Total, all aircraft), 5 hours (Total, this make and model), 10 hours (Last 90 days, all aircraft) | | |

The pilot held an airline transport pilot certificate with a rating for airplane multiengine land, type ratings in the Boeing 747-400, 757, 767, Douglas DC-9, and Cessna 500, commercial pilot privileges

with an airplane single-engine land rating, and a remote pilot certificate. He also held a flight engineer certificate with a turbojet rating. His third-class Federal Aviation Administration airman medical certificate, dated April 20, 2016, listed the restriction, "Must have available glasses for near vision." On the application for that certificate, the pilot reported civilian flight experience totaling 15,020 total hours, and 10 hours in the previous six months. When his third-class airman medical certificate expired for all classes on April 30, 2018, the pilot completed the prerequisites for and was issued a Basic Medical Certificate (BasicMed) on April 20, 2018.

A copy of one of the pilot's logbooks was examined. It contained entries from August 25, 2017, to July 13, 2018. Forwarded totals indicated that the pilot had accumulated 256.2 hours. The pilot purchased the accident airplane July 4, 2018, and had completed 7 flights in the airplane (not including the accident flight), totaling 2.7 hours.

## Aircraft and Owner/Operator Information

| | | | |
|---|---|---|---|
| **Aircraft Make:** | Fisher | **Registration:** | N228LC |
| **Model/Series:** | Celebrity | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1995 | **Amateur Built:** | Yes |
| **Airworthiness Certificate:** | Experimental (Special) | **Serial Number:** | AV1076 |
| **Landing Gear Type:** | Tailwheel | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | July 1, 2018 Condition | **Certified Max Gross Wt.:** | 1100 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | as of last inspection | **Engine Manufacturer:** | Continental |
| **ELT:** | C91 installed, not activated | **Engine Model/Series:** | O-200-A |
| **Registered Owner:** | | **Rated Power:** | 100 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

The accident airplane, serial number AV1076, was issued an FAA Special Airworthiness Certificate on May 23, 1995. It was powered by a 100-horsepower Continental O-200-A engine, driving a Tennessee 2-blade, fixed-pitch wooden propeller (model number 70-44). The data plate indicated that the airplane's gross weight was 1,100 lbs, and its empty weight was 601 lbs.

According to the maintenance records, the most recent condition inspection was performed on July 1, 2018, at a Hobbs meter reading of 442.0 hours and a total time-in-service of 589.0 hours.

## Meteorological Information and Flight Plan

| | | | |
|---|---|---|---|
| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | CVG,896 ft msl | **Distance from Accident Site:** | |
| **Observation Time:** | 17:52 Local | **Direction from Accident Site:** | |
| **Lowest Cloud Condition:** | Scattered / 15000 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 5 knots / | **Turbulence Type Forecast/Actual:** | None / None |
| **Wind Direction:** | 30° | **Turbulence Severity Forecast/Actual:** | N/A / N/A |
| **Altimeter Setting:** | 29.96 inches Hg | **Temperature/Dew Point:** | 30°C / 10°C |
| **Precipitation and Obscuration:** | | | |
| **Departure Point:** | Warsaw, KY (NONE) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Warsaw, KY (NONE) | **Type of Clearance:** | None |
| **Departure Time:** | 17:00 Local | **Type of Airspace:** | Class G |

The following weather observations were recorded by the Madison Municipal Airport, Madison, Indiana, Automated Weather Observation System, located about 30 miles west of the accident site:

At 1655, the observation included wind from 170° at 3 knots, 10 miles visibility, clear sky, temperature 30° C, dew point 12° C, and altimeter setting on 29.99 inches of mercury.

The 1715 observation included wind from 150° at 5 knots, 10 miles visibility, clear sky, temperature 30° C, dew point 13° C, and altimeter setting of 29.98 inches of mercury

## Wreckage and Impact Information

| | | | |
|---|---|---|---|
| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Fatal | **Latitude, Longitude:** | 38.794723,-84.820274 |

The airplane impacted a cornfield about 40 ft south of Indiana State Highway 156. Corn stalks were 7 to 8 ft tall. The airplane came to rest on its right side on a magnetic heading of 310°. The nose and cockpit area were fragmented from impact. The left horizontal stabilizer was undamaged, but the right horizontal stabilizer, vertical stabilizer, and rudder were crushed. The upper tip of the rudder was located about 400 yards west of the main wreckage. The airspeed indicator read 103 mph; the Kollsman window indicated 30.04 inches of mercury. Other instruments were destroyed. The engine and propeller were deeply embedded in the ground.

The upper and lower left wings were attached to each other but were separated from the fuselage and thrust forward of the main wreckage. The aileron remained loosely attached to the wing. Part of the lower right wing was located with the wreckage, but not attached to the fuselage. Additional parts of the upper and lower right wing were found scattered throughout an area between 400 yards and 800 yards west of the main wreckage. A large portion of the upper right wing was not located. Most of the lower bottom wing was located. Small pieces of wing spar and webbing were scattered to the right of the accident site. Portions of the right wings were located about 3 days after the accident about 80 yards from the main wreckage, including a portion of the leading edge cuff and ribs.

The wreckage was recovered from the accident site and transported to AMF Aviation, LLC, Springfield, Tennessee, for further examination. One propeller blade had separated from the hub, but about 8 inches of the other blade remained attached. The propeller blades bore signatures consistent with rotation at impact.

The lower right-wing rear spar attachment fitting, lower right-wing main spar attachment fitting, and right aileron rod end were sent to the NTSB's Materials Laboratory for examination. "Each of the submitted attachment fittings had fractures intersecting the inboard wing spar attachment bolt hole. The fracture features for each attachment fitting were rough and matte gray in appearance, consistent with ductile overstress fracture" and with upward bending of the wing at the attachment location. The outboard end of the attachment fitting piece for the aft spar was also bent to the aft relative to the inboard end, consistent with the entire upper and lower right wings folding in upward and rearward bending and separating from the airplane. Upward bending of the lower wing attachment was secondary to a primary failure elsewhere, the locations of which could not be determined due the fact that a majority of the wing structure was not recovered. There was no evidence of any preexisting damage on the wing spar attachment fittings.

## Medical and Pathological Information

Highpoint Health, Department of Pathology, Lawrenceburg, Indiana, performed an autopsy of the pilot. According to its report, the cause of death was "multiple blunt force injuries."

Toxicology testing performed by the FAA Forensic Science Laboratory detected 71 (mg/dL, mg/hg) and 117 (mg/dL, mg/hg) ethanol in brain and muscle tissue, and N-Butanol and Propanol (N-) in muscle tissue. Putrefaction was noted in specimens. No drugs were detected in muscle tissue. Carbon monoxide and cyanide tests were not performed.

## Administrative Information

| | |
|---|---|
| **Investigator In Charge (IIC):** | Scott, Arnold |
| **Additional Participating Persons:** | Sylvestro R Mumphrey; FAA Flight Standards District Office; Louisville, KY<br>Charles B Holsclaw; FAA Flight Standards District Office; Louisville, KY |
| **Original Publish Date:** | November 6, 2019 |
| **Note:** | The NTSB traveled to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=97841 |