# Aviation Investigation Final Report

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| **Location:** | Jeffersonville, Indiana | **Accident Number:** | CEN23LA281 |
| **Date & Time:** | July 6, 2023, 08:24 Local | **Registration:** | N988CT |
| **Aircraft:** | DIAMOND AIRCRAFT IND INC DA20-C1 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Fuel exhaustion | **Injuries:** | 2 None |
| **Flight Conducted Under:** | Part 91: General aviation - Instructional | | |

## Analysis

The flight instructor reported that, before the flight, he and his student inserted a calibrated wooden stick into the fuel tank to check the fuel quantity of the airplane and believed that it indicated just below ¾ tank, or about 16 gallons of fuel remaining. They completed the preflight inspection and proceeded with the flight to another airport for takeoff and landing practice. While at the other airport, they performed six circuits of the traffic pattern before proceeding back toward the departure airport.

As they approached the airport, the flight instructor heard the engine speed decrease and initially thought his student had retarded the throttle, but she had not. The engine recovered briefly and then sputtered again. The flight instructor said he checked the mixture, master switch, ignition, and fuel pump settings, and the engine continued to have spurts of power. He surmised that they were experiencing a fuel issue and noted that the fuel gauge read empty. He notified air traffic control, and was cleared to land, but had insufficient altitude and executed a forced landing to a corn field. The airplane received substantial damage to the fuselage including separation of the empennage.

Postaccident examination of the airplane revealed no usable fuel remained in the fuel tank.

The flight instructor reported that he believed the time of day, weather conditions and lighting combined with an expectation bias, contributed to misreading of the fuel stick, which likely read below ½ tank before the flight. He also noted that he prepared a safety presentation about the event to present to flying club members and other aviation meetings.

Based on the available information, the engine power loss was due to exhaustion of the airplane's fuel supply.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's improper fuel management, which resulted in fuel exhaustion and a total loss of engine power.

### Findings

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| **Personnel issues** | Fuel planning - Instructor/check pilot |
| **Aircraft** | Fuel - Fluid level |

# Factual Information

## History of Flight

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| **Enroute** | Fuel exhaustion (Defining event) |

## Pilot Information

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|---|---|---|---|
| **Certificate:** | Commercial; Flight instructor | **Age:** | 51,Male |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Right |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 4-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | Airplane single-engine; Instrument airplane | **Toxicology Performed:** | |
| **Medical Certification:** | Class 1 With waivers/limitations | **Last FAA Medical Exam:** | September 26, 2022 |
| **Occupational Pilot:** | Yes | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 940 hours (Total, all aircraft), 101 hours (Total, this make and model), 869 hours (Pilot In Command, all aircraft), 167 hours (Last 90 days, all aircraft), 69 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft) | | |

## Student pilot Information

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|---|---|---|---|
| **Certificate:** | Student | **Age:** | 17,Female |
| **Airplane Rating(s):** | None | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 4-point |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | Yes |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | |
| **Medical Certification:** | Unknown | **Last FAA Medical Exam:** | |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 16 hours (Total, all aircraft), 16 hours (Total, this make and model), 16 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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|---|---|---|---|
| **Aircraft Make:** | DIAMOND AIRCRAFT IND INC | **Registration:** | N988CT |
| **Model/Series:** | DA20-C1 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 1999 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | C0088 |
| **Landing Gear Type:** | Tricycle | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | June 1, 2023 Annual | **Certified Max Gross Wt.:** | 1770 lbs |
| **Time Since Last Inspection:** | | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 9949 Hrs as of last inspection | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-240-B32B |
| **Registered Owner:** | FLIGHT CLUB 502 INC | **Rated Power:** | 125 Horsepower |
| **Operator:** | FLIGHT CLUB 502 INC | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | KSDF,480 ft msl | **Distance from Accident Site:** | 9 Nautical Miles |
| **Observation Time:** | 08:56 Local | **Direction from Accident Site:** | 196° |
| **Lowest Cloud Condition:** | Few / 3800 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | Broken / 25000 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 6 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 250° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29.95 inches Hg | **Temperature/Dew Point:** | 26°C / 22°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Louisville, KY (LOU) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Louisville, KY (LOU) | **Type of Clearance:** | VFR |
| **Departure Time:** | 06:45 Local | **Type of Airspace:** | Class E |

## Wreckage and Impact Information

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| **Crew Injuries:** | 2 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | N/A | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 None | **Latitude, Longitude:** | 38.318108,-85.687989 |

## Administrative Information

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| **Investigator In Charge (IIC):** | Brannen, John |
| **Additional Participating Persons:** | Gary Brown; FAA; Indianapolis, IN |
| **Original Publish Date:** | October 26, 2023 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class 4 |
| **Note:** | The NTSB did not travel to the scene of this accident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=192547 |