Aviation Investigation Final Report

Location:	Ennis, Texas	**Accident Number:**	CEN23FA173
Date & Time:	May 6, 2023, 15:22 Local	**Registration:**	N6798T
Aircraft:	Cessna 310D	**Aircraft Damage:**	Destroyed
Defining Event:	Fuel starvation	**Injuries:**	1 Fatal, 2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a personal flight in a multiengine airplane with two passengers when the accident occurred. According to one of the passengers, the pilot chose to perform a go-around while on final approach; however, the reason for the go-around was not understood. The airplane side-stepped to the right of the runway and immediately rolled to the right. The airplane impacted a field of cedar trees, where a post-impact fire ensued and destroyed the airplane.

Debris in the initial impact crater show that the right wing and right engine impacted the ground first. Both the left and right propellers exhibited chordwise/rotational scoring, which was consistent with both propellers rotating at impact; all damage was consistent with high impact forces. The left propeller exhibited damage consistent with rotation at a higher power level when compared to the right; however, the level of engine power could not be determined definitively from either propeller. Both propellers exhibited damage consistent with rotation at a low blade angle and neither was in a feathered position. There were no discrepancies noted that would preclude or degrade normal operation on either propeller. The left engine was examined and there were no preimpact mechanical failures or malfunctions that would have precluded normal operation.

The right engine was run and initially ran rough. The fuel plug and screen assembly from the fuel injection control assembly was removed and black debris, small string-like fibers, and metallic particles were observed obstructing the screen. Analysis of the debris revealed polyurethane, and metallic particles of brass (zinc and copper) and aluminum. The brass and aluminum were most likely components of the fuel system.

The flexible fluid-carrying hoses had not been replaced since 2001 and were prone to degradation if not replaced after 12 years. The polyurethane and string-like fibers were consistent with a flexible fluid-carrying hose. It is likely that the fuel hose from the fuel system degraded over time and plugged the fuel screen for the right engine which resulted in a partial loss of engine power.

A review of the maintenance records did not indicate that the fuel plug and screen from the fuel injection control assembly were cleaned during the August 2022 annual engine inspection as recommended by both the Cessna Model 310D Maintenance Manual and Continental IO-470 Engine Operator's Manual.

Probable Cause and Findings

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

The partial loss of right engine power due to reduced fuel flow as a result of the contamination of the fuel screen.

Findings

Aircraft	Fuel filter-strainer - Damaged/degraded
Aircraft	Fuel distribution - Damaged/degraded
Aircraft	Engine out control - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Approach-VFR go-around	Fuel starvation (Defining event)
Approach-VFR go-around	Loss of control in flight
Approach-VFR go-around	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

On May 6, 2023, at 1522 central daylight time, a Cessna 310D, N6798T, was destroyed when it was involved in an accident near Ennis, Texas. The pilot and pilot-rated front-seat passenger were seriously injured, and the rear-seat passenger was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

ADS-B data was not available for the accident flight. The pilot-rated front seat passenger reported that the pilot chose to perform a go-around while on final approach for runway 16 at Ennis Municipal Airport (F41), Ennis, Texas. However, the passenger reported she was not sure why the go-around was initiated. During the go-around, the airplane veered to the right and rolled. A statement from the pilot was not received due to the pilot's injuries.

The airplane impacted cedar trees and terrain about 1/4 mile southwest of the runway. A post-impact fire ensued and destroyed the airplane.

Pilot Information

Certificate:	Private	**Age:**	19,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	April 21, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 12, 2023
Flight Time:	302.6 hours (Total, all aircraft), 13.9 hours (Total, this make and model), 246.4 hours (Pilot In Command, all aircraft), 54.1 hours (Last 90 days, all aircraft), 10.1 hours (Last 30 days, all aircraft)		

According to the pilot’s logbook, he passed his private pilot multi-engine check ride on January 12, 2023. The pilot had accumulated a total of 13.9 hours of multi-engine flight time, all of which were in the accident airplane make and model.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6798T
Model/Series:	310D	**Aircraft Category:**	Airplane
Year of Manufacture:	1960	**Amateur Built:**	
Airworthiness Certificate:	Unknown	**Serial Number:**	39098
Landing Gear Type:	Retractable - Tricycle	**Seats:**	5
Date/Type of Last Inspection:	January 20, 2023 Annual	**Certified Max Gross Wt.:**	4830 lbs
Time Since Last Inspection:	6 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	3647 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed	**Engine Model/Series:**	I0-470 SERIES
Registered Owner:	On file	**Rated Power:**	260 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane was purchased by a family member in June 2021. According to logbook records, the first annual inspection performed after purchase was in August 2022. The airframe annual inspection was noted by a mechanic as unairworthy. However, the engines were found to be airworthy, and the annual inspection was signed off for the engines. A list of airframe deficiencies was given to the airplane owner. The owner took the airplane to another mechanic, and the deficient airframe items were addressed. The airplane was approved for return to service by the second mechanic in January 2023.

In February 2020, Continental Aerospace Technologies Service Bulletin (SB20-01) was issued for IO-470-D engines. This SB calls for the fuel plug and screen assembly on the fuel injection control assembly to be removed and cleaned during every annual inspection. An engine logbook entry from the mechanic who signed off the annual inspection on the engines revealed that all fuel injector components were cleaned on both engines, and all engine airworthiness directives were complied with. However, the mechanic stated that their records do not indicate whether SB20-01 was performed.

Before the August 2022 and January 2023 annual inspections, the airplane had not had an annual inspection since June 2013. Additionally, the engine logbooks indicated that both engines were overhauled in November 2001. When the engines were overhauled, all rubber flexible fluid-carrying hoses were replaced. A review of the airframe and engine maintenance logbooks revealed no record of the hoses having been replaced since the November 2001 overhaul.

The airplane was equipped with two Continental IO-470-D engines. Continental recommends hoses be replaced as needed upon a conditional inspection or at engine overhaul. Continental also recommends that the IO-470-D be overhauled at 1,500 hours or every 12 years, whichever occurs first due to the possible deterioration of rubber that could affect the airworthiness of the engine and engine-mounted components and accessories.

At the time of the August 2022 and January 2023 annual inspections, the recorded Hobbs time in the maintenance records was 1,526.4. The airplane had avionics maintenance performed on May 2, 2023, and the recorded Hobbs time was 1,532.7. A search of ADS-B data revealed that the last recorded flight was April 28, 2023, so between the time the airplane was signed off as airworthy in January 2023 and the accident flight, the airplane accumulated about 6 hours of flight time.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KJWY,749 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	15:35 Local	**Direction from Accident Site:**	301°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 2700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	29°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX (KDWH)	**Type of Flight Plan Filed:**	VFR
Destination:	Ennis, TX (F41)	**Type of Clearance:**	Unknown
Departure Time:	14:24 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Ennis Municipal Airport F41	**Runway Surface Type:**	
Airport Elevation:	500 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Go around

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal, 1 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 2 Serious	**Latitude, Longitude:**	32.303906,-96.632386(est)

The airplane impacted a lightly wooded area about 1/4 mile southwest of F41. The impact path was on a heading of about 234° and the airplane came to rest upright about 75 ft from the initial impact site on a heading of about 100°. Debris consistent with the right wing and right engine were found in between the initial tree strike and the main wreckage.

The right engine, with the propeller still attached at the flange, was found about 30 ft southwest of the main wreckage. The main wreckage consisted of the fuselage, left and right wings, left engine, left propeller, and empennage. The main wreckage, except for the right wing and empennage, exhibited burn damage consistent with postimpact fire. Except for the left aileron, which was consumed by fire, all primary and secondary control surfaces were intact and attached to the airplane, and control cable continuity was confirmed from each control surface to the cockpit. The propellers and engines were moved to a secure location for further examination.

On the left propeller, both blades exhibited chordwise/rotational scoring on the camber and face sides with bending and twisting damage. Both blades had wave bends on the leading edge. The left propeller was in a low pitch setting and was not feathered.

On the right propeller, there was chordwise/rotational scoring on the camber side of one blade. Blade damage included simple bending with no remarkable twisting or leading edge damage. The right propeller was in a low pitch setting and was not feathered. Examination of the left engine revealed soot deposits, debris, and some impact damage. Compression and suction were obtained on all cylinders. There were no preimpact mechanical failures or malfunctions noted that would have precluded normal operation.

Examination of the right engine revealed soot deposits, debris, and impact damage. Compression and suction were obtained on all cylinders. The right engine was run in a test cell and initially ran roughly. The fuel plug and screen assembly from the fuel injection control assembly housing was removed. It was obstructed with black debris, small string-like fibers, and metallic fragments. The fuel plug and screen were replaced with a new exemplar component. During the second engine run, the engine started without hesitation and ran smoothly. The original fuel screen was sent to the National Transportation Safety Board (NTSB) Materials Laboratory for analysis along with a sample of the right fuel bladder.

The NTSB materials laboratory tested the black debris and metallic particles found on the right engine fuel plug and screen assembly. The black debris was a match for polyurethane. The metallic particles consisted of brass (copper and zinc) and aluminum

The flexible fluid-carrying hoses are made of polyurethane. However, due to post-impact fire damage, a sample of the hoses was unable to be retained for analysis to determine a match.

According to Continental Motors, the polyurethane and string-like fibers were consistent with a flexible fluid-carrying hose.

Injuries to Persons

The pilot and front seat passenger sustained serious injuries, and the backseat passenger was fatally injured.

Administrative Information

Investigator In Charge (IIC):	Abraham, Laura
Additional Participating Persons:	Curtis Anthony; FAA FSDO; Irving, TX Kurt Gibson; Textron Aviation; Wichita, KS Philip Grice; Continental Motors; Mobile, AL Les Doud; Hartzell Propellers; Dayton, OH
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