Aviation Investigation Final Report

Location:	McKinney, Texas	**Accident Number:**	CEN24FA240
Date & Time:	June 27, 2024, 10:28 Local	**Registration:**	N414BS
Aircraft:	Cessna 414A	**Aircraft Damage:**	Destroyed
Defining Event:	Fuel starvation	**Injuries:**	2 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was departing on a local flight to check newly installed avionics on the airplane. During takeoff, the airplane lifted off within the performance specifications cited in the airplane flight manual. Shortly after liftoff, the pilot reported to air traffic control (ATC) that he had lost left engine power. The pilot continued the takeoff with the landing gear still extended.

A witness stated that the airplane seemed to lose left engine power during the takeoff before reaching taxiway B4, and "yawed left quite a bit." The remaining runway distance from the B4 taxiway to the departure end of the runway was about 2,600 to 2,700 ft. The witness stated that the airplane was not far past the departure end of runway when it began to turn left.

As the pilot continued the takeoff and attempted the climb out, ATC instructed the pilot to turn right. The pilot responded that he was going to turn left, which was a turn into the inoperative engine and in the improper direction due to the greater left rolling tendency and increased likelihood of a loss of control. As the flight progressed, the airplane ground speed slowed to the airplane's air minimum control speed (Vmc) when it rolled left and impacted terrain in an inverted attitude. The airplane was destroyed.

Postaccident examination of the airplane revealed no mechanical anomalies that would have precluded normal operation. The examination revealed the left engine fuel tank valve was in the Off position, which starved the left engine of fuel, creating a total loss of left engine power. The left engine propeller was not feathered, and the landing gear was extended.

Although the pilot completed ground and flight training and a proficiency check in the make and model airplane about 4 months before the accident, he failed to ensure proper fuel tank selection, with the fuel selector in the OFF position for the left engine and failed to land on the remaining runway after the loss of left engine power. Following the decision to continue the

takeoff, the pilot also failed to follow engine inoperative emergency procedures that would have increased airspeed/climb rate to enable continued flight. The pilot's actions resulted in a loss of control that led to a Vmc roll and impact with terrain.

Probable Cause and Findings

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

The pilot's improper decision to attempt continued flight after a loss of left engine power with usable runway remaining and his subsequent failure to follow the emergency procedures and maintain air minimum control speed, which resulted in a loss of control. Contributing to the accident was the pilot's improper fuel tank selection that resulted in a loss of left engine power due to fuel starvation.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Aircraft control - Pilot
Personnel issues	Use of checklist - Pilot
Aircraft	Fuel selector/shutoff valve - Incorrect use/operation
Aircraft	Airspeed - Not attained/maintained

Factual Information

History of Flight

Takeoff	Fuel starvation (Defining event)
Takeoff	Loss of control in flight

On June 27, 2024, at 1028 central daylight time, a Cessna 414A airplane, N414BS, was destroyed when it was involved in an accident near McKinney, Texas. The private pilot and a passenger were fatally injured, and a second passenger sustained serious injuries. The airplane was operated under Title 14 *Code of Federal Regulations* Part 91 as a personal flight.

The purpose of the flight was for the airplane owner and pilot to perform an avionics check flight along with two passengers who were employees of the facility that had installed the avionics. The flight was to be about 30 to 45 minutes long and flown northeast of the airport, returning to the departure airport to fly instrument approaches. There was no record that fuel was obtained for the airplane at the departure airport before the flight.

The airplane took off from runway 18 at the McKinney National Airport (TKI), Dallas, Texas. Airport surveillance video showed that the airplane lifted off the runway before the second runway/taxiway intersection, B2, which was about 2,100 ft down the runway. The distance from the B2 taxiway intersection to the end of the runway was about 4,800 ft, excluding the hard surface beyond the runway departure end, as shown in Figure 1.

Figure 1. Runway remaining distance from B2.

Shortly after liftoff, the pilot reported losing power in the left engine. ATC instructed the pilot to turn right, but there was no response. After ATC asked the pilot his intentions, the pilot

responded that they were turning left. ATC cleared the flight to land in whichever direction the pilot needed.

A witness in an office near taxiway B4 (the fourth runway/taxiway intersection down runway 18) said that during takeoff, the airplane engine quickly went from a “loud” to a “bogged” sound, and he stated that it sounded like an engine failure. The witness went outside and saw the airplane in a left yaw with its landing gear extended. He reported that it seemed as if the airplane lost left engine power before it flew past taxiway B4, and the airplane was about 50 to 75 ft above runway 18 and about 2,600 to 2,700 ft from the departure end of runway 18. The witness said that he “hoped” that the pilot would have reduced the right engine power and landed straight ahead. The airplane then rolled left and upside down and dove into the ground from about 100 ft agl.

ADS-B data for the airplane showed that when the airplane climbed to 600 ft, its speed was 99 kts while approaching the third runway/taxiway intersection, B3. The airplane’s speed then decreased to a range of 93 kts to 65 kts before increasing to 70 kts, which was the last recorded data point.

Pilot Information

Certificate:	Private	**Age:**	67,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	October 10, 2023
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 2, 2023
Flight Time:	(Estimated) 1544 hours (Total, all aircraft)		

The pilot received ground training and 10 hours of flight training in a Cessna 414 airplane and completed a Part 61.56(a) flight review on March 2, 2023, all of which were provided by a flight instructor.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N414BS
Model/Series:	414A	**Aircraft Category:**	Airplane
Year of Manufacture:	1980	**Amateur Built:**	Yes
Airworthiness Certificate:	Normal	**Serial Number:**	414A0504
Landing Gear Type:	Tricycle	**Seats:**	8
Date/Type of Last Inspection:	April 23, 2024 Annual	**Certified Max Gross Wt.:**	6900 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	7223.7 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C91A installed	**Engine Model/Series:**	TSIO-520-NB
Registered Owner:	On file	**Rated Power:**	335 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The Pilot Operating Handbook (POH) and FAA Approved Flight Manual Performance and Specifications indicated that at 98 knots indicated airspeed (KIAS), 0° of wing flaps, and 6,750 pounds of weight, the airplane's ground roll would be 2,185 ft and the distance required to clear a 50-ft obstacle would be 2,595 ft.

The POH states that air minimum control speed is 79 KIAS, and the one-engine-inoperative best rate-of-climb speed is 108 KIAS (wing flaps up). The Engine Inoperative Procedures with their immediate action items call for immediately closing the engine throttles during takeoff (speed below 98 KIAS or gear down), and after takeoff, to feather the inoperative engine, raise the landing gear, and maintain one engine inoperative best rate of climb speed of 108 KIAS.

The left and right engines, originally manufactured by Continental Motors with 310 horsepower (hp), were modified by Ram Aircraft, Limited Partnership, under a supplement type certificate, to provide increased engine power to 335 hp as RAM Series VII engines.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	TKI,589 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	30°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	McKinney, TX	**Type of Flight Plan Filed:**	None
Destination:	McKinney, TX	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class D

Airport Information

Airport:	McKinney National Airport TKI	**Runway Surface Type:**	Concrete
Airport Elevation:	589 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	7002 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal, 1 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal, 1 Serious	**Latitude, Longitude:**	33.160833,-96.583667(est)

The airplane wreckage was about 0.7 miles southeast of the departure end of runway 18. The airplane impacted a gravel mound and landed in an inverted position on a northeasterly heading. Portions of the wings and instrument panel sustained thermal damage consistent with a post-crash fire. The landing gear was extended and both wing flaps were retracted. Flight control continuity from the control surfaces to the cockpit controls was confirmed.

Both propellers were separated from their respective engines at the propeller flanges, which exhibited a granular 45° fracture surface consistent with torsional overstress. Both propellers exhibited features of rotation. Neither propeller was in a feathered position. The left propeller was near the low pitch stop and exhibited features consistent with rotation at low/no power. The right propeller was in a normal operating pitch position and exhibited features consistent with rotation at a high-power setting. Disassembly examination of both propellers revealed no anomalies that would have precluded normal operation.

Propeller control continuity was confirmed from the cockpit controls to the propeller governor on each engine. Disassembly examination of the left and right engine governors revealed no mechanical anomalies that would have precluded normal operation.

The cockpit left fuel tank selector was in the OFF position, and the cockpit right fuel tank selector was in the ON position. The left fuel tank selector valve, located in the left wing, was in the OFF position, consistent with the selector position in the cockpit. There was no deformation of structure between the selector valve and the cockpit control. The right-wing fuel tank selector valve, located in the right wing, was in the Right Main fuel tank position. Engine throttle and mixture control continuity was confirmed from the cockpit controls to the fuel control unit and throttle body of each engine.

Rotation of each engine confirmed drivetrain continuity to the accessory section and confirmed valvetrain continuity. During engine rotation, air was drawn in and expelled in proper sequence through the top spark plug holes with those spark plugs removed. Borescope examination of each cylinder assembly did not reveal abnormal wear or coloration features.

The left and right magnetos were attached and secured on their respective engine mounting pads and could not be moved by hand. Rotation of the left engine's left magneto confirmed electrical continuity. The right engine's left magneto sustained thermal damage from the post-crash fire, and an electrical spark could not be produced. Rotation of the right engine's right magneto confirmed electrical continuity. The left and right engine spark plugs displayed normal coloration features.

The left and right engine fuel pump drive couplings were intact, and each pump could be rotated using hand pressure. There was no debris in the fuel system affecting the fuel supply to, and the distribution within, either engine.

The left and right engine turbocharger compressor/turbine wheels rotated using hand pressure. The examination identified no anomalies in either engine that would have precluded normal engine operation.

Medical and Pathological Information

An autopsy of the pilot was performed by the Collin County Medical Examiner's Office, McKinney, Texas. The autopsy report stated that the pilot died of blunt force injuries and the manner of death was accident.

The FAA Forensic Toxicology Report for the pilot was negative for substances tested.

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Gary Watson; Federal Aviation Administration, North Texas FSDO; Irving, TX Ricardo Asensio; Textron Aviation; Wichita, KS J Ferrell; Continental Aerospace Technologies; Mobile, AL Brian Cozine; McCauley Propeller Systems; Wichita, KS Les Doud; Hartzell Propellar; Piqua, OH
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