Aviation Investigation Final Report

Location:	Peyton, Colorado	**Accident Number:**	CEN23FA349
Date & Time:	August 5, 2023, 12:06 Local	**Registration:**	N4184G
Aircraft:	NANCHANG CHINA CJ-6A	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The accident occurred during a prebriefed honor flight, performed at the conclusion of a retirement ceremony, that involved two airplanes of similar make and model flying low passes and maneuvers. Witnesses reported that the accident airplane, which was positioned behind the lead airplane, pitched up near vertical and rolled as it transitioned from the base to final leg of the airport traffic pattern. During the maneuver, the airplane entered a spiraling nose-down descent and impacted the ground. Both pilots had flown the airplanes uneventfully earlier that day. Although the lead pilot reported that they did not perform any aerobatic maneuvers during the accident flight, the accident airplane's near-vertical climb and roll, as reported by the witnesses, was consistent with aerobatic flight.

Examination of the accident site revealed that the airplane impacted the ground in a nose-low and right wing-low attitude and came to rest on a southeast heading about 158 ft from the initial impact area. The engine, propeller, and both wings were separated and located within the debris field. All major structural components of the airplane were located at the accident location.

Examination revealed no anomalies with the engine or airframe that would have precluded normal operation. Damage signatures and witness accounts indicate that the engine was producing power at the time of the accident.

Toxicology testing revealed that the pilot had an elevated HbA1c and urine glucose, with an HbA1c level indicative of uncontrolled diabetes with chronically elevated blood sugar. Symptoms of high blood sugar may include fatigue and blurred vision; in severe cases, high blood sugar can be associated with severe metabolic disturbances that can lead to altered consciousness. However, whether the pilot was experiencing significant impairing effects of

his uncontrolled diabetes at the time of the accident could not be determined from the available medical evidence.

Probable Cause and Findings

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

The pilot's exceedance of the airplane's critical angle of attack while intentionally maneuvering in a steep bank at low altitude, which resulted in an accelerated aerodynamic stall/spin and subsequent loss of airplane control.

Findings

Aircraft	Pitch control - Not attained/maintained
Aircraft	Angle of attack - Capability exceeded
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering-aerobatics	Aerodynamic stall/spin (Defining event)

On August 5, 2023, about 1206 mountain daylight time, a Nanchang China CJ-6A airplane, N4184G, was substantially damaged when it was involved in an accident near Peyton, Colorado. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Several witnesses reported observing the accident airplane and another airplane of similar make and model perform low passes and maneuvers together in the vicinity of the Meadow Lake Airport (FLY), Colorado Springs, Colorado.

According to the pilot of the lead airplane, he and the accident pilot were performing an honor flight at the conclusion of a retirement ceremony, which they had discussed the day before. The lead pilot stated that, on the morning of the accident, they briefed the honor flight and completed a practice flight, which included station keeping, overhead breaks, and practice maneuvers. The lead pilot reported that the initial flight of the day went “really well.” He said there was nothing noteworthy regarding that flight, and he knew of no anomalies with the accident airplane.

After a 1-hour break between flights, the lead pilot and the accident pilot taxied their airplanes past the ceremony and completed a preflight run-up for the honor flight. After announcing their intentions over the airport common traffic advisory frequency (CTAF), they departed about 1155. The lead airplane departed first, followed by the accident airplane. After joining up, they returned and executed an overhead pattern with a break. They departed to the east and then returned for a second overhead pattern and a break. Afterward, they completed two low passes, pulled up, and planned to return for one final low pass. The lead pilot reported that they did not perform any aerobatic maneuvers during the honor flight.

A witness who was performing an instructional flight in the traffic pattern reported that, while she was on left downwind for runway 15, she saw the lead airplane perform a low pass down the runway, and the second airplane was ahead of her on the left base. As she transitioned her flight to left base, she observed the second airplane pitch up near vertical and perform an aileron roll, then enter a spin. As the airplane descended in a spin, it passed under her airplane about 500-700 ft above ground level then impacted the ground. She stated that there were no spacing issues between the two airplanes and her flight.

The lead pilot stated that he did not observe the accident but heard a pilot in a Cessna 172 report it over the CTAF. The lead pilot overflew the area but could not locate the accident site and ultimately landed. He stated that the other airplane in the traffic pattern did not affect the honor flight at all.

A witness at the airport reported that he observed the accident airplane pitch up and bank left about 60° to 90° as it transitioned from base to final approach. The airplane then entered a right spin and made one to two revolutions before it impacted the ground. Another witness near the accident site stated the airplane was in a right-banked, nose-down descent, and its engine was “loud” as it descended below the tree line.

Review of the ADS-B data provided by the FAA revealed that both the lead and accident airplanes broadcast data during the first flight. The data showed that during the practice flight, they performed a series of relatively uniformed maneuvers about 15 miles northeast of the airport then returned and performed two passes over runway 15 with turns to the left. During the second flight, the lead airplane’s data showed a series of non-uniformed passes over the runway with turns to the left, and one turn to the right about 1/2-mile northwest of the approach end of runway 15. There was no ADS-B data received from the accident airplane during the second flight.

Pilot Information

Certificate:	Private	**Age:**	56,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed With waivers/limitations	**Last FAA Medical Exam:**	September 28, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 18, 2021
Flight Time:			

The pilot’s logbook was not recovered, and he did not report any civil flight hours during his FAA medical examination in 2017. The pilot was a member of the Red Star Pilots Association (RSPA). According to RSPA, he completed wingman ground school on September 16, 2021, and an air show operations quiz on September 18, 2021. On the wingman application, the pilot checked the qualification box verifying that that he had at least 350 hours of flight time and at least 10 hours of formation time within the previous 2 years.

According to the FAA medical case report, the pilot's last aviation medical examination was in October 2017. The pilot reported no medications or medical conditions at that time, although he had previously reported diabetes controlled with diet and exercise and had been issued a Letter of Eligibility for this condition in November 2015. His medical certificate subsequently expired. The pilot completed a BasicMed Course and reported completing a BasicMed Comprehensive Medical Examination Checklist, both in September 2019.

Aircraft and Owner/Operator Information

Aircraft Make:	NANCHANG CHINA	**Registration:**	N4184G
Model/Series:	CJ-6A	**Aircraft Category:**	Airplane
Year of Manufacture:	1965	**Amateur Built:**	
Airworthiness Certificate:	Unknown	**Serial Number:**	1332008
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	June 1, 2023 Condition	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	39.2 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4976.3 Hrs at time of accident	**Engine Manufacturer:**	Housai
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	MDL-H6A
Registered Owner:	KFLYIN LLC	**Rated Power:**	285 Horsepower
Operator:	KFLYIN LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FLY,6874 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	12:15 Local	**Direction from Accident Site:**	189°
Lowest Cloud Condition:	Scattered / 2600 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.31 inches Hg	**Temperature/Dew Point:**	23°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Colorado Springs, CO (FLY)	**Type of Flight Plan Filed:**	None
Destination:	Colorado Springs, CO (FLY)	**Type of Clearance:**	None
Departure Time:	11:55 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Meadow Lake Airport KFLY	**Runway Surface Type:**	Asphalt
Airport Elevation:	6878 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	15/33	**IFR Approach:**	None
Runway Length/Width:	6001 ft / 60 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	38.964854,-104.56625(est)

The airplane's main wreckage was located in front of a residence about 1 mile northeast of the approach end of runway 15. Examination of the accident site revealed that the airplane's first point of impact was a ground scar that contained fragments of the right wing. The second point was a ground scar that contained sections of the lower forward fuselage skin. Abrasions

and broken tree limbs were noted to a tree on the bank of a pond. The separated left wing and sections of fuselage were observed in the vicinity of the tree.

The main wreckage came to rest on a southeast heading about 158 ft from the initial impact area and about 75 ft and across the pond from the damaged tree. The engine, propeller, and about 5 ft of the inboard right wing were recovered from the pond. The airplane sustained substantial damage to the fuselage, wings, and empennage. All major components of the airplane were located at the accident location.

Examination revealed that the left and right wings exhibited impact damage and were separated from the fuselage. The right aileron remained attached to its mounts, and the left aileron was impact separated from the wing. The aileron control rods were impact separated at various locations of both wings. Impact damage was noted to the empennage structure. Rudder and elevator control continuity was established from the cockpit to the flight control surfaces. The left and right wing fuel tanks were breached from impact forces. About 10 gallons of fuel was recovered from the left fuel tank and was found to be clear of debris. No anomalies were noted to the fuel system.

The engine was impact separated from the airframe, and its engine mount was fragmented. The propeller assembly and a portion of the engine's planetary gear section were separated. Both propeller blades exhibited S-bending and chordwise abrasions, and the propeller hub exhibited torsional deformation. No preaccident anomalies were observed to the airplane that would have precluded normal operation.

Medical and Pathological Information

The El Paso County Coroner performed an autopsy on the pilot. The cause of death was determined to be from multiple blunt force injuries, and his manner of death was accident.

Postmortem toxicological testing performed by the FAA Forensic Sciences Laboratory measured a hemoglobin A1c (HbA1c) of 12% in cavity blood and a urine glucose of 803 mg/dL.

HbA1c is an indirect measure of a person's average blood sugar over about the preceding 3 months. An HbA1c of 6.5% or higher indicates diabetes. For a person with diabetes, HbA1c of less than 7% generally indicates good diabetes control. An HbA1c of 12% corresponds to an estimated average blood sugar of about 300 mg/dL over the preceding few months. Generally,

a person's blood sugar varies throughout the day in response to multiple factors. In many adults with diabetes, target peak blood sugar after eating is less than 180 mg/dL.

Glucose in random fresh urine normally is 25 mg/dL or less. It may increase due to high blood glucose or altered kidney function. Urine glucose is raised by high blood glucose only if the blood glucose surpasses a certain threshold, which varies among individuals, but which typically is significantly higher than normal blood glucose. The FAA toxicology laboratory considers postmortem urine glucose above 100 mg/dL to be abnormal.

Tests and Research

A Sentry Plus portable ADS-B and GPS receiver was recovered from the wreckage and sent to the NTSB Recorders Laboratory for data recovery. Examination revealed that the device sustained impact damage, and its internal microSD card, which would store track log data, was absent. Therefore, no data were recovered from the device.

Additional Information

Title 14 *CFR* 91.3039(e) states that no person may operate an aircraft in aerobatic flight below an altitude of 1,500 ft above the surface. The regulation defines aerobatic flight as "an intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight."

Preventing Similar Accidents

Prevent Aerodynamic Stalls at Low Altitude (SA-019)

The Problem

While maneuvering an airplane at low altitude in visual meteorological conditions, many pilots fail to avoid conditions that lead to an aerodynamic stall, recognize the warning signs of a stall onset, and apply appropriate recovery techniques. Many stall accidents result when a pilot is momentarily distracted from the primary task of flying, such as while maneuvering in the airport traffic pattern, during an emergency, or when fixating on ground objects.

What can you do?

- Be honest with yourself about your knowledge of stalls and your preparedness to recognize and handle a stall situation in your airplane. Seek training to ensure that you fully understand the stall phenomenon, including angle-of attack (AOA) concepts and how elements such as weight, center of gravity, turbulence, maneuvering loads, and other factors affect an airplane's stall characteristics.
- Remember that an aerodynamic stall can occur at any airspeed, at any attitude, and with any engine power setting.
- Remember that the stall airspeeds marked on the airspeed indicator (for example, the bottom of the green arc and the bottom of the white arc) typically represent steady flight speeds at 1G at the airplane's maximum gross weight in the specified configuration. Maneuvering loads and other factors can increase the airspeed at which the airplane will stall. For example, increasing bank angle can increase stall speed exponentially. Check your airplane's handbook for information.
- Reducing AOA by lowering the airplane's nose at the first indication of a stall is the most important immediate response for stall avoidance and stall recovery.
- Manage distractions when maneuvering at low altitude so that they do not interfere with the primary task of flying.
- Resist the temptation to perform maneuvers in an effort to impress people, including passengers, other pilots, persons on the ground, or others via an onboard camera. "Showing off" can be a deadly distraction because it diverts your attention away from the primary task of safe flying.
- Understand that the stall characteristics of an unfamiliar airplane may differ substantially from those of airplanes with which you have more flight experience.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-019.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Galbraith, Damian
Additional Participating Persons:	Brian McAmis; FAA; Denver, CO
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