Aviation Investigation Final Report

Location:	Lewisville, Arkansas	**Accident Number:**	CEN23FA167
Date & Time:	April 30, 2023, 17:00 Local	**Registration:**	N31311
Aircraft:	Titan TORNADO	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Before the flight, the non-certificated pilot stated to the private airstrip owner that he was going to demonstrate the airplane's climb performance during the takeoff and departure. The airstrip owner reported that the pilot performed a steep climbing takeoff and then initiated a left turn over wooded terrain.

A witness, located near the departure end of the airstrip, reported that she thought the airplane was going to impact a tree in her yard due to its low altitude. The airplane then banked to the left before impacting the tree canopy southeast of her residence. The airplane entered the trees in a left-wing-down position before coming to rest inverted in a marsh. Both the private airstrip owner and the witness stated that the surface wind was gusting at the time of the accident.

Postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

The ethanol detected in the pilot's cavity blood was likely from sources other than alcohol consumption, and it is unlikely that ethanol effects contributed to the accident.

Based on the available evidence, it is likely that the non-certificated pilot failed to maintain airspeed during a steep initial climb and low-altitude turn, which led to an exceedance of the airplane's critical angle of attack, aerodynamic stall, and loss of control at an altitude too low to recover.

Probable Cause and Findings

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

The non-certificated pilot's failure to maintain airspeed and his exceedance of the airplane's critical angle of attack, which resulted in an aerodynamic stall and loss of control at an altitude too low to recover.

Findings

Personnel issues	Qualification/certification - Pilot
Aircraft	Angle of attack - Capability exceeded
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Initial climb	Loss of control in flight (Defining event)
Initial climb	Aerodynamic stall/spin
Initial climb	Collision with terr/obj (non-CFIT)

On April 30, 2023, about 1700 central daylight time, a Titan Tornado experimental light-sport airplane, N31311, was destroyed when it was involved in an accident near Lewisville, Arkansas. The non-certificated pilot sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The private airstrip owner reported that the accident pilot and two other airplanes arrived earlier that day.

According to witnesses, the surface winds had increased during the day, and the winds were gusty when the three pilots elected to depart. The airstrip owner noted that the winds were gusty enough that he would not have operated his personal airplane from his airstrip at the time. The airstrip owner reported that the accident pilot told him he intended to perform a steep climbing takeoff on departure to demonstrate the airplane's climb performance.

The airstrip owner observed the airplane take off, then enter a steep initial climb and left turn over wooded terrain before he lost sight of the airplane due to the terrain.

A witness, located at her residence near the departure end of the runway, reported that the first two airplanes appeared to depart normally before the accident airplane's departure. During the accident airplane's departure, the witness thought the airplane would impact a tree in her yard when it banked to the left at a low altitude, but the airplane impacted trees southeast of her residence (See Figure 1).

Figure 1. Accident site overview.

Pilot Information

Certificate:	None	**Age:**	46,Male
Airplane Rating(s):	None	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	None	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Titan	**Registration:**	N31311
Model/Series:	TORNADO II	**Aircraft Category:**	Airplane
Year of Manufacture:	2007	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental light sport (Special)	**Serial Number:**	D99912SOHK0356
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	March 31, 2022 Condition	**Certified Max Gross Wt.:**	1000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	455 Hrs as of last inspection	**Engine Manufacturer:**	ROTAX
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	912S
Registered Owner:	On file	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KAGO,319 ft msl	**Distance from Accident Site:**	21 Nautical Miles
Observation Time:	16:55 Local	**Direction from Accident Site:**	100°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / 15 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	25°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lewisville, AR	**Type of Flight Plan Filed:**	None
Destination:	Haynesville, LA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.265485,-93.574049(est)

The main wreckage was located in a flat, wooded marsh south of the private airstrip. All major components of the airplane were accounted for at the accident site. The right wing separated from the fuselage when it impacted a tree about 80 ft from where the main wreckage came to rest on its right side. The left wing remained partially attached to the fuselage.

Flight control continuity could not be established due to impact-related damage; however, all separations were consistent with overstress separation. An odor consistent with automotive fuel was present in the debris field. The 3-blade composite propeller exhibited impact-related damage; two blades were broken with their blade roots still within the propeller hub.

The engine exhibited mechanical continuity of the drivetrain and valvetrain components when the propeller was rotated by hand. Postaccident examination of the airframe and engine revealed no preimpact mechanical failures or malfunctions that would have precluded normal operation.

An electronic flight information system device (EFIS) and digital engine monitor were retained for further examination. Subsequent examination showed that no data was recorded by the EFIS; the engine monitor was damaged, prohibiting any data recovery.

Medical and Pathological Information

An autopsy was performed by the Arkansas State Crime Laboratory, Little Rock, Arkansas, which listed the cause of death as “multiple blunt force injuries,” and the manner of death was accident.

Toxicology testing performed at the Federal Aviation Administration (FAA) Forensic Sciences Laboratory identified ethanol at 0.02 g/dL in the pilot’s cavity blood. Ethanol was not detected in the pilot’s urine or vitreous. N-propanol was also detected at a low level in cavity blood and

was not detected in urine or vitreous fluid. Dextromethorphan was detected in urine; testing was inconclusive for dextromethorphan in cavity blood. Dextrorphan was detected in cavity blood; testing was inconclusive for dextrorphan in urine. Metformin was detected in cavity blood and urine. Amlodipine, lisinopril, and hydrochlorothiazide were detected in cavity blood and urine, and chlorothiazide was detected in urine but not in cavity blood. Acetaminophen was detected in cavity blood and urine. Salicylic acid was detected in urine but not in cavity blood.

Ethanol is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. FAA regulation imposes strict limits on flying after consuming ethanol, including a prohibition on piloting a civil aircraft while having a blood ethanol level of 0.04 g/dL or greater. Alcohol consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can sometimes be produced by microbes in a person's body after death. Ethanol may also be an additive in some automotive fuels.

Dextromethorphan is a cough suppressant medication that is available over the counter in a variety of cold and allergy products. Dextromethorphan is not typically impairing at levels associated with medicinal use. The FAA states that pilots who use dextromethorphan should observe a waiting period for the drug to be cleared from circulation before flying.Dextrorphan is an active metabolite of dextromethorphan.

Metformin is a prescription oral medication commonly used for blood sugar control in diabetes and prediabetes. Amlodipine, lisinopril, and hydrochlorothiazide are prescription medications commonly used to treat high blood pressure. Chlorothiazide may be present as an impurity in hydrochlorothiazide and is also a prescription diuretic medication. Acetaminophen is a medication available in a wide variety of over-the-counter products as a pain and fever reducer. Salicylic acid is the primary active metabolite of aspirin, a widely available over-the-counter medication that can be used to control pain and fever and to reduce cardiovascular risk. Metformin, amlodipine, lisinopril, hydrochlorothiazide, chlorothiazide, acetaminophen, and salicylic acid/aspirin are not generally considered impairing.

Glucose was measured at 88 mg/dL in urine and was not detected in vitreous.

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):	Sauer, Aaron
Additional Participating Persons:	Paul Centinaro; FAA; Little Rock, AR
Original Publish Date:	September 11, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=107170