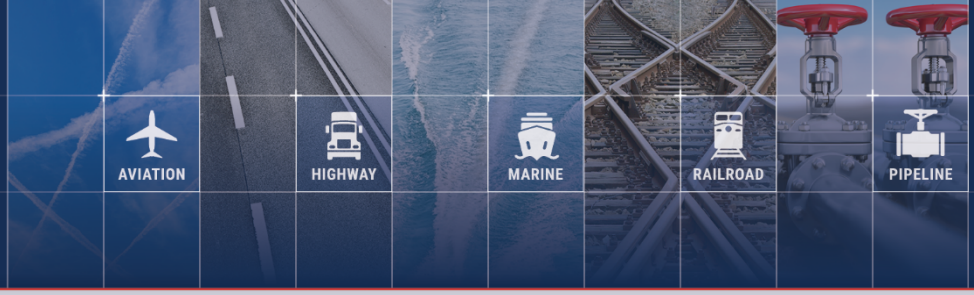

Aviation Investigation Final Report

Location:	Murrieta, California	**Accident Number:**	WPR23FA247
Date & Time:	July 4, 2023, 13:57 Local	**Registration:**	N5243E
Aircraft:	Cessna 172N	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal, 3 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was taking his family for scenic flights after receiving his private pilot certificate about 2 weeks earlier. They completed one successful flight and then departed on the second, which was the accident flight. Upon returning to their departure airport, the airplane landed normally, but during the landing roll, the front seat passenger heard a “pop” sound and subsequently felt the airplane shake, at which time the pilot started to panic. The pilot advanced the throttle and the airplane lifted off the runway surface again. Surveillance video captured the airplane as it began to climb in a nose-high attitude, drifted left of the runway, then rolled inverted and rapidly descended.

Postaccident examination of the airplane and engine revealed no preimpact mechanical anomalies that would have precluded normal operation. The wing flaps were found in the retracted position. The source of the “pop” sound reported by the passenger could not be determined, nor could it be determined why the pilot chose to take off immediately after having successfully touched down on the runway, as he had planned a full-stop landing. The reported wind at the time of the accident indicated a headwind accompanied by a right crosswind that was within the airplane’s maximum demonstrated crosswind component.

The circumstances of the accident are consistent with the pilot’s exceedance of the airplane’s critical angle of attack during takeoff, which resulted in an aerodynamic stall and loss of control. Evidence shows that the pilot retracted the flaps from the fully extended position to the flaps up position while the airplane was in a high angle of attack as it veered left of the runway towards buildings. The sudden retraction of flaps at a low altitude would have resulted in a loss of lift and a descent, which likely contributed to the loss of control.

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 during takeoff, which resulted in an aerodynamic stall and loss of control. Contributing to the loss of control was the pilot's sudden retraction of the flaps.

Findings

Aircraft	Pitch control - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Takeoff	Aerodynamic stall/spin (Defining event)

On July 4, 2023, about 1357 Pacific daylight time, a Cessna 172N airplane, N5243E, was substantially damaged when it was involved in an accident near Murrieta, California. The pilot was fatally injured, and the three passengers were seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot's wife reported that they had planned a local scenic flight with their kids. They arrived at the airport about noon and completed one flight with the pilot's wife and one of their four children. She and her son deplaned, and the other three sons boarded the airplane and subsequently departed on the accident flight. They flew the same route as the first flight and then returned to the departure airport about 1355 for a full-stop landing.

Surveillance video showed the airplane on an approach toward runway 18. The airplane touched down on the runway, rolled for about 1-2 seconds, then departed the runway surface and immediately entered a climb in a nose-high attitude as it drifted left of the runway centerline. After the airplane reached about 60 ft above ground level, it began to settle and subsequently entered a left-wing-low attitude. The airplane rolled inverted and then disappeared from view of the camera behind a building. Approximate flap positions could not be determined due to the resolution of the video.

A witness reported that the airplane's approach to runway 18 was "squirrely" and the flaps appeared to be fully extended. After the airplane made contact with the runway, about 1,000 ft from the approach end of runway 18, the witness heard the engine power advance and observed the airplane take off again. The airplane then veered off the side of the runway about a 35° angle relative to the runway heading. According to the witness, the airplane was still configured with full flaps as it slowly climbed toward a group of buildings at a high angle of attack. As the airplane neared the group of buildings, its wings rocked back and forth, and the flaps started to retract. The airplane rolled to the left and disappeared behind the building, which was immediately followed by a loud sound. He noted that the engine was operating at high power throughout the climb and no interruptions in power were noted.

The NTSB investigator-in-charge played an audio clip of the airplane's stall warning horn for two of the passengers. One of the passengers recalled hearing the stall warning horn during landing and possibly during the takeoff and the other passenger did not recall hearing the stall warning horn. During a subsequent interview, the pilot's wife reported that her son who was seated in the front right seat on the accident flight told her that the airplane landed normally, but during the landing roll he heard a "pop," and the airplane began to shake. He then observed his father's demeanor change as he began to panic and then advanced the throttle again.

Pilot Information

Certificate:	Private	**Age:**	39,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	September 29, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 19, 2023
Flight Time:	65.3 hours (Total, all aircraft), 64.3 hours (Total, this make and model)		

According to records retrieved from the Federal Aviation Administration, the pilot received his private pilot certificate on June 19, 2023. This was the pilot's first flight following his practical test.

The pilot began his flight training with Riverside Flight Academy on July 21, 2020, in the same airplane make and model as the accident airplane. He flew with a total of 7 different flight instructors at the flight academy totaling about 35 hours of instruction. He started training with Executive Flight Institute, LLC (EFI) on September 19, 2020. He accumulated about 7 hours of flight training between November 2020 and July 2021. The pilot did not accrue any flight time with EFI between August 2021 and August 2022. He subsequently flew about 2 to 6 hours per month from September 2022 until the month of his check ride.

One of the pilot's instructors reported that the pilot had trouble advancing the yoke to keep the airplane's nose down during go-arounds. The instructor reported that the pilot had a habit of configuring the airplane with excessive nose-up trim for landing.

According to documents provided by the pilot's designated pilot examiner (DPE), they performed multiple takeoffs and landings that included a normal takeoff and landing, a full-stop followed by short-field and soft-field takeoffs and landings, a slip, and a go-around at F70. The DPE's notes showed that the pilot completed each task satisfactory.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5243E
Model/Series:	172N	**Aircraft Category:**	Airplane
Year of Manufacture:	1978	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17271793
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 26, 2023 100 hour	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	44 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4352 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320 H2AD
Registered Owner:	CALIFORNIA PROFESSIONAL FLYERS INC	**Rated Power:**	180 Horsepower
Operator:	CALIFORNIA PROFESSIONAL FLYERS INC	**Operating Certificate(s) Held:**	Pilot school (141)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KF70,1512 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	13:55 Local	**Direction from Accident Site:**	330°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 18 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.94 inches Hg	**Temperature/Dew Point:**	33°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Murrieta, CA	**Type of Flight Plan Filed:**	None
Destination:	Murrieta, CA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	French Valley Airport F70	**Runway Surface Type:**	Asphalt
Airport Elevation:	1349 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	6000 ft / 75 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 Serious	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 3 Serious	**Latitude, Longitude:**	33.574179,-117.12847(est)

The airplane came to rest inverted in an industrial complex about 0.3 nm on a heading of about 125° magnetic from the approach end of runway 18. All major structural components of the airplane were accounted for at the accident site. The airplane came to rest adjacent to an approximate 50-ft-tall building, which displayed a diagonal transfer mark that extended nearly the vertical length of the building. A dark black transfer mark was observed on the same wall about 5 ft from the ground and multiple horizontally oriented striations were below the black mark. An additional black transfer mark was located a few inches from the striations.

Postaccident examination of the airframe and engine revealed no preimpact mechanical anomalies or malfunctions that would have precluded normal operation. The elevator trim tab exhibited 15° nose-down deflection, consistent with the elevator trim tab indicator. The flap selector was found in the “up” position and the indicator displayed 20°. The flap actuator jackscrew threads were not exposed, consistent with the flaps being fully retracted.

Medical and Pathological Information

An autopsy of the pilot was performed by the Riverside County Sheriff – Coroner Division. According to the autopsy report, the cause of death was multiple traumatic injuries.

Additional Information

Stall Speeds

The pilot's operating handbook (POH) included the airplane's stall speeds in a power OFF configuration at a weight of 2,220 lbs. According to the POH, the stall speed in a flaps-up configuration at a level attitude with a rearward center of gravity (CG) is 42 knots (kts) and the stall at a 30° bank angle is 45 kts. The stall speed in a flaps-up configuration at a level attitude with a forward center of gravity (CG) is 45 kts and the stall speed at a 30° bank angle is 48 kts. The section also includes a note: *"maximum altitude loss during a normal stall recovery is approximately 300 ft."*

The normal procedures in the POH state that a balked landing should be conducted at maximum power with flaps at 20° and 55 kts indicated airspeed. These values are based on a maximum weight of 2,220 lbs.

Weight and Balance

An airplane weight and balance was computed using a basic empty weight of 1,475 lbs, a combined occupant weight of 564 lbs and a fuel weight of 240 lbs (40 gallons). The airplane total weight was approximately 2,279 lbs and the calculated CG was 43.88 inches aft from the datum. According to the pilot's operating handbook, the airplane's forward CG limit was 38.5 inches aft from the datum and the aft CG limit was 47.3 inches from the datum.

Crosswind Component

The reported wind gusts at the time of the accident would have produced a headwind component of about 16 kts and a right crosswind of about 6 kts. The sustained winds at the time would have produced a headwind component of 10 kts and a right crosswind of 3 kts.

According to the POH, the maximum demonstrated crosswind velocity in the accident airplane was 15 kts.

According to the FAA Airplane Flying Handbook (FAA-8083-H-3C),

"After establishing the proper climb attitude and power settings [during a go around maneuver], the pilot's next concern is flap retraction. After the descent has been stopped, the landing flaps are partially retracted or placed in the takeoff position as recommended by the manufacturer.

Depending on the airplane's altitude and airspeed, it is wise to retract the flaps intermittently in small increments to allow time for the airplane to accelerate progressively as they are being raised. A sudden and complete retraction of the flaps could cause a loss of lift resulting in the airplane settling into the ground."

Administrative Information

Investigator In Charge (IIC):	Stein, Stephen
Additional Participating Persons:	Christina Wall; Federal Aviation Administration; Riverside, CA Ricardo Asensio; Textron Aviation; Wichita, KS David Harsanyi; Lycoming Engines; Williamsport , PA
Original Publish Date:	July 5, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192510