



Aviation Investigation Final Report

Location:	Addison, Texas	Accident Number:	CEN18LA344
Date & Time:	August 18, 2018, 15:00 Local	Registration:	N893JA
Aircraft:	Cessna 172	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	3 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot reported that, shortly after departing on a discovery flight, the airplane began veering left. He applied right rudder and aileron; however, the airplane continued to veer left. He recalled hearing the stall warning horn and stated that he lowered the nose and adjusted the trim, but the airplane continued in a nose-down position and impacted the ground.

A video of the accident flight showed the airplane in a high- pitch attitude shortly after takeoff, followed by the left wing dropping and a rapid descent, consistent with an aerodynamic stall. Given that the pilot had just taken off, there was insufficient altitude to recover from the stall.

The airplane sustained substantial damage to the fuselage, wings, and empennage. A postaccident examination did not reveal any evidence of a preimpact failure or malfunction that would have precluded normal operation. The examination revealed a flap setting of 30°. Weight and balance calculations determined that the airplane was loaded about 138 lbs over its maximum gross weight, which, in combination with the flap setting during takeoff, would have adversely affected the airplane's climb rate. In an attempt to maintain a positive rate of climb, the pilot inadvertently exceeded the airplane's critical angle of attack and aerodynamically stalled the airplane.

Probable Cause and Findings

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

The pilot's improper flap setting for takeoff and subsequent exceedance of the airplane's

critical angle of attack, which resulted in an aerodynamic stall. Contributing was the overgross state of the airplane.

Findings

Personnel issues	Use of equip/system - Pilot
Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained
Aircraft	TE flap control system - Incorrect use/operation
Aircraft	(general) - Incorrect use/operation
Personnel issues	Weight/balance calculations - Pilot

Factual Information

History of Flight

Prior to flight	Aircraft loading event
Takeoff	Aerodynamic stall/spin (Defining event)

On August 18, 2018, about 1500 central daylight time, a Cessna 172S airplane, N893JA, was substantially damaged when it was involved in an accident near Addison, Texas. The pilot and two passengers were seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 discovery flight.

The pilot stated that, before departing Addison Airport (ADS), Addison, Texas, on the discovery flight with two passengers on board, he completed a weight and balance calculation on his phone and determined they were within the center of gravity limits for the airplane. He stated that the fuel had been “topped off” (56 gallons) by the prior flight instructor. The pilot explained that he cycled the flaps twice during his preflight inspection, once to ensure they fully extended and retracted, and a second time to visually inspect the rods and roller tracks. No issues were identified during the preflight inspection.

The pilot reported that the engine performed “normally” on takeoff until the airplane began veering to the left. He applied right rudder and aileron. The controls felt normal with no resistance, but the airplane continued to veer over the grass toward the taxiway. The pilot recalled hearing the stall warning horn sound; he lowered the nose and adjusted the trim. He tried to keep the nose up, but the airplane continued in a nose-down position and impacted the dirt. The pilot recalled the airplane’s nose had started to lift prematurely when he applied power and he attempted to push it down before liftoff. The airplane sustained substantial damage to the fuselage, wings, and empennage.

A surveillance video from a tenant at ADS showed the airplane in a high-pitch attitude shortly after takeoff. As the airplane moved into the center of the video frame, its pitch attitude remained consistent until the left wing dropped, followed by a quick descent. The airplane impacted the ground left wing first.

The pilot stated that there were no mechanical issues with the airplane. A postaccident examination of the airplane did not reveal any evidence of a preimpact failure or malfunction that would have precluded normal operation. The flap actuator indicated a flap setting of 30°.

A weight and balance calculation based on the available loading information revealed that the takeoff gross weight was about 2,688 lbs; the maximum gross weight of the airplane was 2,550 lbs.

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	26, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	February 5, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	January 12, 2018
Flight Time:	612.3 hours (Total, all aircraft), 551.8 hours (Pilot In Command, all aircraft), 161.1 hours (Last 90 days, all aircraft), 47.3 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		Age:	Female
Airplane Rating(s):		Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Passenger Information

Certificate:		Age:	Female
Airplane Rating(s):		Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N893JA
Model/Series:	172 S	Aircraft Category:	Airplane
Year of Manufacture:	2009	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	172S10893
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	July 6, 2018 100 hour	Certified Max Gross Wt.:	2550 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	2400.6 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-360-L2A
Registered Owner:		Rated Power:	160 Horsepower
Operator:		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:	KADS,644 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	22:47 Local	Direction from Accident Site:	40°
Lowest Cloud Condition:	Scattered	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	220°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.91 inches Hg	Temperature/Dew Point:	37°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Addison, TX	Type of Flight Plan Filed:	None
Destination:	Addison, TX	Type of Clearance:	VFR
Departure Time:		Type of Airspace:	Class D

Airport Information

Airport:	Addison ADS	Runway Surface Type:	Asphalt
Airport Elevation:	644 ft msl	Runway Surface Condition:	Dry
Runway Used:	15	IFR Approach:	None
Runway Length/Width:	7203 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	2 Serious	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	3 Serious	Latitude, Longitude:	32.968612,-96.836387(est)

Administrative Information

Investigator In Charge (IIC):	Liedler, Courtney		
Additional Participating Persons:	Morris McAllister; FAA; Irving, TX		
Original Publish Date:	May 27, 2021	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98111		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).