Aviation Investigation Final Report

Location:	Las Vegas, Nevada	**Accident Number:**	WPR19FA252
Date & Time:	September 7, 2019, 19:50 Local	**Registration:**	N24030
Aircraft:	Beech C24	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal, 2 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot departed the runway and reported that a door had opened. After clearance to enter the traffic pattern and return to the airport, the airplane climbed to about 100 ft agl and struggled to gain altitude. The airplane turned left and subsequently entered a nose down left bank and impacted the terrain. The airplane sustained substantial damage. As the airplane banked to the left, it likely experienced an aerodynamic stall.

Postaccident examination of the propeller blades revealed that the engine was likely operating near high rpm at impact, and examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The pilot's operating handbook indicated an open door would slipstream and may result in buffeting and that the pilot is to fly the airplane "normally."

The occupants departed earlier the same day in the accident airplane and returned because the airplane was not being able to climb over mountains on their way to their destination. Density altitude was calculated to be 5,437 ft mean sea level at the airport. The airplane was also loaded over the maximum gross takeoff weight and exceeded the aft of the center of gravity limit for both flights.

Although the airplane was able to take off, its overweight and aft of CG limit condition and the high-density altitude increased the airplane's stall speed and degraded its climb performance, stability, and slow-flight characteristics. When the pilot turned the airplane left to return to the airport due to the reported open door, the critical angle of attack was likely exceeded and resulted in an aerodynamic stall at low altitude.

Probable Cause and Findings

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

The pilot’s operation of the airplane over its maximum gross weight and outside of center of gravity limits at a high-density altitude, which resulted in the exceedance of the airplane's critical angle of attack while maneuvering and subsequent aerodynamic stall at low altitude. Contributing to the accident was the occupants’ failure to ensure the airplane’s doors were secure prior to takeoff.

Findings

Personnel issues	Decision making/judgment - Instructor/check pilot
Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Aircraft	Maximum weight - Capability exceeded
Aircraft	Maximum weight - Related operating info
Environmental issues	High density altitude - Effect on equipment

Factual Information

History of Flight

Prior to flight	Ground handling event
Initial climb	Loss of control in flight (Defining event)

On September 7, 2019, about 1950 Pacific daylight time, a Beechcraft C-24R, N24030, was destroyed when it was involved in an accident near Las Vegas, Nevada. The pilot receiving instruction and the flight instructor were seriously injured and the two passengers sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 cross-country instructional flight.

Neither pilot provided a statement as to the events leading up to the accident.

An eyewitness that was located at the north end of the Henderson Executive Airport (HND), Las Vegas, Nevada, was monitoring the tower frequency with a handheld radio. Additionally, he saw the accident airplane taxi near his location and perform a run-up, all while the airplane's right entry door was open. The airplane's engine sounded normal during the run-up and the entry door was then closed prior to the pilots receiving takeoff clearance and entering the runway.

The eyewitness reported that the airplane appeared to roll down the runway of about 500-600 ft with about 50% power before full power was applied. Shortly after the airplane lifted off the runway. The airplane climbed to about 50 to 100 ft above ground level (agl) and struggled to gain altitude; climbing a few feet and then descending. The eyewitness heard the pilot's report to the tower on his radio that a door had opened and his request to return to land. The airplane then appeared to climb an additional 50 to 100 ft agl then entered a left turn. Subsequently, the airplane entered a nose-down left bank and impacted the terrain.

Air traffic control recordings revealed that the pilot taxied short of runway 17R and performed a runup prior to departure. The pilot reported that he was ready for departure and was then cleared for runway 17R. A few minutes later the pilot reported that a door opened during climb and that he needed to return. The pilot was cleared by the controller to enter right or left closed traffic. No more communication was heard from the pilot.

Airport employees reported that the accident airplane arrived at HND around 0800 on the day of the accident and parked at the transient parking for about 1-1/2 hours. The airplane was refueled to a little more than halfway up the fuel tank tabs. A total of 23 gallons of fuel was added to the airplane. Shortly after refueling, four individuals were aboard the airplane when it departed HND and then returned about a 30 minutes later to the transient parking area. An occupant on that flight stated to one of the airport employees that it was too hot, and that the airplane couldn't climb to get around the mountains.

Pilot Information

Certificate:	Private	**Age:**	26,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	July 11, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 25, 2019
Flight Time:			

Flight instructor Information

Certificate:	Flight instructor	**Age:**	31,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	January 16, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 22, 2019
Flight Time:	250 hours (Total, all aircraft), 200 hours (Pilot In Command, all aircraft)		

Passenger Information

Certificate:		**Age:**	60,Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	48,Male
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N24030
Model/Series:	C24 R	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	MC-487
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	August 21, 2019 100 hour	**Certified Max Gross Wt.:**	2758 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4744 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360-A1B6
Registered Owner:	So Cal Leasing LLC	**Rated Power:**	200 Horsepower
Operator:	California Flight Academy	**Operating Certificate(s) Held:**	Pilot school (141)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	KHND,2458 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:56 Local	**Direction from Accident Site:**	9°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.8 inches Hg	**Temperature/Dew Point:**	34°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Las Vegas, NV (HND)	**Type of Flight Plan Filed:**	VFR
Destination:	El Cajon, CA (SEE)	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class D

At 1056, HND reported wind was variable at 3 knots, 10 miles visibility, clear skies, temperature at 36°C, dew point 11°C, and an altimeter setting of 29.98 inches of mercury.

Later that evening at 1956, HND reported wind from 210° at 12 kts, 10 miles visibility, clear skies, temperature 34°C, dew point 4°C, and an altimeter setting of 29.80 inches of mercury. Density altitude was calculated to be about 5,437 ft msl.

Airport Information

Airport:	Henderson Executive HND	**Runway Surface Type:**	Asphalt
Airport Elevation:	2491 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	17R	**IFR Approach:**	None
Runway Length/Width:	6501 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Serious	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal, 2 Serious	**Latitude, Longitude:**	35.971389,-115.13388(est)

Examination of the accident site revealed that the airplane impacted a divided roadway, slid through a steel barrier fence, and came to rest in a culvert drainage area. The empennage separated from the main wreckage just aft of the baggage door area and was found adjacent to the culvert entrance. The main wreckage was partially consumed by post-impact fire. The cabin area and the wing's inboard sections, including the wing fuel tanks were mostly consumed by post-impact fire. Both entry doors and the baggage door were mostly consumed by post-impact fire. The latch assemblies for all doors were identified and were in the engaged (out) position. The aft baggage door latch strike plate was found and showed normal signs of wear. The latch strike plates for the two entry doors were not found during the examination of the wreckage.

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

Tests and Research

The airplane's estimated total weight at the time of the accident, including about 40 gallons of fuel, four occupant weights and the weight of tools was about 2,835 lbs. The airplane's takeoff distance was calculated using a performance chart from the airplane's Pilot's Operating Handbook. According to the chart, at the airplane's maximum gross weight of 2,750 lbs, temperature of 34°C, at a pressure altitude of 5,437 ft mean sea level (msl), with a cross wind component of 6 knots, the airplane required a ground roll distance of 1,900 ft and 2,800 ft to clear a 50 ft obstacle. The airplane's maximum rate of climb at maximum gross weight would have been about 525 ft per minute (fpm).

The airplane was loaded over the max gross takeoff weight and aft of the center of gravity moment envelope for both flights.

Additional Information

According to the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) Chapter 10, Weight and Balance, excessive weight reduces flight performance in almost every respect. Some of the most important performance deficiencies of an overloaded aircraft include higher takeoff speed, longer takeoff run, reduced rate and angle of climb, and higher stalling speed.

According to the C24R Pilot's Operating Handbook, the emergency procedure for an unlatched door in flight is as follows:

If the cabin door latch is not fully engaged, it may come unlatched in flight. This usually occurs during or just after takeoff. The door will trail in a position approximately 3 inches open. A buffet may be encountered with the door open in flight. Return to the field in a normal manner. If practicable, during the landing flare-out have a passenger hold the door to prevent it from swinging open.

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew
Additional Participating Persons:	Rich Ramirez; FAA FSDO; Las Vegas, NV Jennifer Barclay; Textron Aviation; Wichita, KS Mark Platt; Lycoming Engines; Phoenix, AZ
Original Publish Date:	April 21, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100207