



National Transportation Safety Board Aviation Accident Final Report

Location:	Wendover, UT	Accident Number:	WPR11FA242
Date & Time:	06/01/2011, 1433 MDT	Registration:	N475ER
Aircraft:	CESSNA 172R	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	4 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

About 2 hours after takeoff the pilot contacted air traffic control (ATC) services requesting that the controller identify his airplane on radar and provide him with location information. The controller provided the location information and vectors to the requested airport. A review of the ATC communications indicated that the pilot was unsure of his location and was low on fuel. At this point in the flight, the airplane's center of gravity (cg) was calculated to be 2.3 inches aft of the aft cg limit. Generally, as the cg moves aft beyond the aft limit there is an increasing likelihood that the airplane will enter a realm of decreasing pitch stability and have tail-heavy flight characteristics. The pilot attempted to land on a runway with an 80-degree crosswind that was 24 knots gusting to 28 knots. The airplane flew almost sideways down the runway and touched down on the runway several times before climbing back into the air. Surveillance video captured images of the airplane climbing above the runway; between 300 and 400 feet above ground level (agl) it made a right-hand turn, then plummeted vertically and impacted the ground. The sudden change from a 24-knot left crosswind to a 24-knot tailwind during the pilot's execution of the right-hand turn towards the downwind leg of the landing pattern, combined with some pitch sensitivity due to the cg location, most likely induced an aerodynamic stall and subsequent loss of lift that was not anticipated nor compensated for by the pilot. A postaccident examination of the airplane revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. The pilot did not receive a weather brief from flight services, nor had he logged in to the Federal Aviation Administration's on-line flight planning system.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot did not maintain adequate airspeed during the downwind turn resulting in an aerodynamic stall, in-flight loss of control, and spin. Contributing to the accident was the pilot's inadequate preflight planning and exceedance of the approved weight and balance envelope.

Findings

Aircraft	Altitude - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Weight/balance calculations - Pilot (Cause)
Environmental issues	Crosswind - Ability to respond/compensate (Factor)

Factual Information

HISTORY OF THE FLIGHT

On June 1, 2011, at 1433 mountain daylight time, a Cessna 172R, N475ER, while executing a go-around entered a rapid vertical descent and collided with the ground at the Wendover Airport, Wendover, Utah. The airplane was registered to G&B Investment Management, Inc., which operated it as a rental airplane under the provisions of Title 14 Code of Federal Regulations Part 91. The private pilot and 3 passengers were fatally injured, and the airplane was substantially damaged. Visual meteorological conditions prevailed, and a visual flight plan had not been filed. The flight originated from St. George, Utah, around 1200.

The pilot rented the airplane from G&B Aircraft Management on May 31, and departed from the Bountiful Utah Skypark Airport, where the airplane is based, for the purpose of flying himself and three passengers to St. George, Utah, for business purposes. The Bountiful Airport was scheduled to be closed for 2 days, June 1-2, for runway maintenance. Family members of the pilot stated to Federal Aviation Administration (FAA) officials that the pilot and his passengers planned to return by flying from St. George to Provo, Utah, on Tuesday, June 1st. Provo Municipal Airport is about 45 miles south of Bountiful. A witness that was with the pilot the evening before the flight and the morning of the flight stated that he was not aware of the pilot doing any flight planning while they were together.

The FAA provided radio communications and radar playback files of air traffic control interaction with the pilot, and Lockheed Martin provided a communications transcript of interaction between Prescott Flight Service and the pilot. The first communication between the pilot and the Flight Service Station occurred at 1403 when the pilot requested that he be identified by air traffic control, and given his current location. At 1406, Flight Service provided the pilot a frequency to Salt Lake Center, 125.575 kHz. The pilot could not establish communications on that frequency, and radioed back to Flight Service, who provided him a second frequency, 128.55 kHz. At 1420, the pilot contacted Clover Control (Hill Air Force Base), and requested guidance to the Wendover Airport. At 1422, Clover Control established radar contact, and told the pilot that he was 23 miles south of Wendover. The pilot then requested runway information at Wendover. Clover Control replied that runways 26 and 08 were open, runways 12 and 30 were closed, and also conveyed the weather conditions at Wendover; VFR, winds from 220 degrees at 21 knots with gusts to 25. At 1423, the pilot asked for a heading to Tooele, but then decided to remain on course to Wendover. Between 1424 and 1428, Clover control remained in radio contact with the pilot, and ensured that the pilot had the Wendover airport in sight before directing him to switch to the Wendover common airport advisory (UNICOM) frequency. A recording of the Wendover frequency had the pilot making standard traffic radio calls starting at 1429, and at 1431, the pilot stated that he was on final for runway 26. Wendover operations radioed the pilot to see if he needed fuel services, and the pilot replied that he will need fuel.

Witnesses who were working on runways 30 and 12 at Wendover observed the airplane attempt to land on runway 26. Witnesses described the airplane touching down on the runway multiple times, and flying down the runway sideways with the nose pointing into the wind before starting a climb out. When the airplane had regained a few hundred feet above the runway it turned north, turning down wind. As the airplane made its turn to the north, witness stated that the airplane suddenly rolled and descended straight down.

Video imagery of the accident was captured by a surveillance camera that was mounted on the Wendover Airport Terminal building, which is located north of the runways. The video depicted a small airplane traveling over the runway, gaining altitude, which then made a turn towards the camera, and then suddenly descending vertically into the ground.

The airspace between St George and Wendover to the north-northwest, contained the following special use airspace areas; restricted areas R-6405, R-402A, R-6407, R-6406A, R-6402B, and R-6406B, and the following military operating areas (MOA's), Sevier MOA-A, Sevier MOA-B, Sevier MOA-C, Sevier MOA-D, and the Gandy MOA. Flight operations within these airspaces at the very least requires the pilot to check the scheduled time of use of each area, and in some cases coordination with the controlling agency prior to entry. A flight route to the north-northeast of St George to Provo would be clear of the listed special use airspace.

PERSONNEL INFORMATION

The pilot, age 57, held a private pilot certificate with a rating for single-engine land issued January 26, 2008, and a third-class airman medical certificate issued March 18, 2009, with the limitation that he must possess corrective lenses for near vision. The pilot's logbook recorded that his most recent flight was his flight review on October 8, 2010, and he had a total of 186.0 flight hours at that time. Since his flight review, G&B Aircraft Management rental records for the pilot show a single flight entry for 0.4 hours, on May 4, 2011.

AIRPLANE INFORMATION

The four-seat, high-wing, fixed landing gear airplane, serial number 17280670, was manufactured in 1998. It was powered by a Lycoming IO-360-L2A, 200-hp engine, and equipped with a McCauley fixed pitch propeller, model number 1A170E/JHA7660, serial number TLO49. Review of the maintenance logbooks showed the most recent 100-hour inspection was completed on May 26, 2011, at a total airframe time of 7,392.3 hours. The most recent 100-hour engine inspection was also completed on May 26, 2011; engine total time was 6,520.5 hours, total time since overhaul was 1,233.4 hours, and tach time was 5,495.5 hours. On scene documentation of the tachometer showed 5,511.7 displayed in the numeral dial window.

The most recent weight and balance record contained in the airplane's pilot operating handbook recovered at the accident site was dated June 2, 2004, listed a maximum weight of 2,558.00 lbs, and an empty weight of 1,670.17 lbs. A fuel sales receipt from Above View FBO in St George shows the purchase of 44.2 gallons of 100LL avgas. Fuel capacity of a Cessna 172R is 53 gallons. The personal bags of the pilot and passengers were collected and weighed, totaling 76.6 lbs. The pilot weighed 189 lbs, the passenger in the copilot's seat weighed 165 lbs, and the passengers in the rear seat had a combined weight of 438 lbs. Total airplane weight, assuming a full fuel load, was 2,857 lbs, 299 lbs over max gross weight. The center of gravity (cg) was calculated to be 124.8 inches. The furthest aft cg limit as established by Cessna is 115.5 inches at 2,550 lbs gross weight. By mathematically extrapolating the aft cg limit to accommodate the 2,857 lb airplane weight, the calculated aft limit would be located at 121.1 inches, which would place the airplane's actual cg 3.7 inches aft of the predicted aft limit. In general, the further aft the cg is located the likelihood of entering a realm of airplane instability is increased. For cg calculated with an empty fuel load, the airplane weight would have been 2,539 lbs, 19 lbs below maximum gross weight, and the moment would have been 117.8, 2.3 inches aft of maximum allowable. The technical representative for Cessna stated that the elevator trim tab was

approximately 15 degrees tab up when examined on scene. The maximum upward travel limit for the elevator trim tab is 22 degrees tab up (+ 1 degree/-0 degree). The Cessna representative stated that this was a good indication the aircraft was tail heavy, but not beyond control.

The pilot who flew the airplane on May 27, 2011, said that he did not recall any mechanical or avionics problems with the airplane, and that the stall warning horn was working properly at that time.

The Cessna Model 172R Pilot Operating Handbook (POH) states that the maximum demonstrated crosswind velocity is 15 knots, and is noted that this is not a limitation.

WRECKAGE AND IMPACT INFORMATION

Wreckage was located on flat desert terrain between the approach ends of runways 8 and 12. The debris direction was oriented along a magnetic bearing of 015 degrees. The entire airplane wreckage was located in the immediate vicinity of the initial point of ground impact.

The initial point of impact was identified by green glass lens fragments from the right wing tip position light. The distance from the initial point of impact to the main airplane wreckage was approximately 70 feet. There was disturbed earth leading from the initial point of impact to the main wreckage. The left wing was partially folded under the fuselage, and the right wing was folded over the right side of the fuselage. Both wings' leading edges were crushed accordion style, and the outboard leading edge section of the right wing was curled over the top surface of the wing. Ailerons and flaps were attached to both wings. Fuel was observed leaking out of both left and right wings. The cockpit instrument panel was severely fragmented, and the instruments displaced. The tail section was intact, with the vertical stabilizer in place with the rudder, and the horizontal stabilizer in place with both elevators attached. The outboard section of the left horizontal stabilizer and elevator was crushed laterally and bent upward. Control cables were traced from the cockpit to both ailerons; the right aileron control cable had separated at the wing root in broomstraw fashion. The flap jackscrew was fully retracted, corresponding to a flaps-up condition. Elevator cables were traced continuous from the cockpit to the elevator bell crank. The rudder cables were traced from the cockpit to the rudder bell crank; the left rudder cable was found separated in broomstraw fashion inside the aft fuselage floor assembly. The elevator trim actuator was measured extended 1.6 inches, which corresponds to 15 degrees tab up. The fuel selector was in the both position.

The engine, a Lycoming IO-360-L2A, was examined on-scene. The spark plugs were removed, and appeared to be normal per the Champion Aviation Check-A-Plug Chart AV-27, with no mechanical damage noted. The fuel servo and fuel flow divider contained fuel. The engine was rotated by hand and thumb compression achieved on all four cylinders. Approximately 4 quarts of oil was drained from the oil sump. Both magnetos were rotated by hand and spark observed at all leads. The McCauley fixed pitch propeller was attached to the engine propeller flange. One propeller blade exhibited extensive blade face polishing, and was wrapped aft around the engine; the other blade remained straight, and exhibited moderate leading edge polishing.

MEDICAL AND PATHOLOGICAL INFORMATION,

An autopsy was performed on the pilot on June 2, 2011, by the State of Utah, Department of Health, Deputy Chief Medical Examiner, Salt Lake City, Utah. The autopsy identified the immediate cause of death as blunt force injuries of the head, torso, and extremities.

Forensic toxicology was performed on specimens from the pilot by the Forensic Toxicology Research Team CAMI, Oklahoma City, Oklahoma. The toxicology report stated 10 mg/dL of ethanol detected in blood, 5 mg/dL methanol detected in liver, and 3.121 ug/ml acetaminophen detected in blood.

METEOROLOGICAL INFORMATION

The Wendover airport weather observation system (AWOS) recorded at 1435, wind from 200 degrees at 24 knots gusting to 28; 10 statute miles visibility; and the sky was clear of clouds. Runway 12/30 at Wendover was closed for construction.

Prescott Flight Service has no records of the pilot receiving a weather brief on May 31 or June 1 from Lockheed-Martin Flight Services or DUATS (Direct User Access Terminal Service), the FAA’s on-line flight planning system.

The following weather information was available to the pilot prior to his departure:

AIRMET (Airmen’s Meteorological Conditions) TANGO issued at 0745 for turbulence and sustained surface winds greater than 30 knots for Nevada, Utah, and Arizona, developing from 0800 to 1000 continuing beyond 1400, and ending between 1700 and 2000.

Terminal Area Forecast (TAF) for Provo issued at 0420; starting at 1200 winds 180 degrees at 18 knots gusting to 28 knots, prevailing visibility 6 statute miles, and sky clear.

Terminal Area Forecast (TSF) for Wendover issued at 0420; starting at 0900 winds from 140 degrees at 12 knots gusting to 20 knots, prevailing visibility 6 statute miles, and sky clear. Starting at 1300, winds from 180 degrees at 18 knots gusting to 28 knots, prevailing visibility 6 statute miles, and sky clear.

History of Flight

Prior to flight	Aircraft loading event Preflight or dispatch event
Approach-VFR go-around	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	57, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last Medical Exam:	03/18/2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	10/08/2010
Flight Time:	186 hours (Total, all aircraft), 0 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	Registration:	N475ER
Model/Series:	172R	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Utility	Serial Number:	17280670
Landing Gear Type:		Seats:	4
Date/Type of Last Inspection:	05/26/2011, 100 Hour	Certified Max Gross Wt.:	2558 lbs
Time Since Last Inspection:	17 Hours	Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	LYCOMING
ELT:	C91A installed, activated, did not aid in locating accident	Engine Model/Series:	IO360 SER
Registered Owner:	C/O G&B INVESTMENT MANAGEMENT INC	Rated Power:	180 hp
Operator:	C/O G&B INVESTMENT MANAGEMENT INC	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KENV, 4237 ft msl	Observation Time:	1435 MDT
Distance from Accident Site:		Condition of Light:	Day
Direction from Accident Site:		Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	26° C / -7° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	24 knots/ 28 knots, 200°	Visibility (RVR):	
Altimeter Setting:	29.76 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	St George, UT (KSGU)	Type of Flight Plan Filed:	None
Destination:	Provo, UT (KPVU)	Type of Clearance:	None
Departure Time:	1200 MDT	Type of Airspace:	

Airport Information

Airport:	Wendover (KENV)	Runway Surface Type:	Asphalt
Airport Elevation:	4237 ft	Runway Surface Condition:	Dry
Runway Used:	26	IFR Approach:	None
Runway Length/Width:	8000 ft / 150 ft	VFR Approach/Landing:	Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	3 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 Fatal		

Administrative Information

Investigator In Charge (IIC):	Van McKenny	Adopted Date:	08/29/2012
Additional Participating Persons:	David C Longan; Federal Aviation Administration; Salt Lake City, UT Troy Helgeson; Lycoming Engines; Miliken, CO Peter J Basile; Cessna Aircraft Company; Wichita, KS		
Publish Date:	08/29/2012		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=79276		

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