Aviation Investigation Final Report

Location:	Las Vegas, New Mexico	**Accident Number:**	CEN17FA315
Date & Time:	August 9, 2017, 10:25 Local	**Registration:**	N3664Z
Aircraft:	Piper PA 22-150	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

This report was modified on March 15, 2022. Please see the public docket for this accident to view the original report.

The private pilot departed on a cross-country flight in day visual meteorological conditions. When he did not arrive at his destination as planned, a search was initiated, and the airplane was subsequently located in wooded, mountainous terrain near a private airport about 73 miles short of the destination. The orientation of the wreckage was consistent with the airplane impacting terrain following an aerodynamic stall. Examination of the airplane and engine did not reveal any anomalies that would have precluded normal operation, and there was evidence of fuel at the accident site.

The pilot was not in contact with air traffic control during the flight. Radar information showed the airplane maneuvering near the airport before radar contact was lost; the pilot may have been attempting to divert to the airport when the accident occurred.

An autopsy of the pilot revealed severe coronary artery disease with 90% stenosis of the left coronary artery as well as evidence of scarring from a previous heart attack. Each of these conditions placed the pilot at significantly increased risk for the sudden development of symptoms from an acute cardiac event. Although the pilot might have decided to divert because he was impaired or incapacitated by the symptoms of an acute cardiac event, this scenario could not be corroborated by any operational evidence.

The airplane's flight track indicated that the pilot maneuvered the airplane into a "bowl" area that included the runway. Afterward, the pilot flew a right downwind leg and turned too closely onto the base leg to complete the base-to-final turn. As a result, the pilot made a 270° left turn inside the rim of the bowl area to align with the runway. As the pilot made the base-to-final turn, he again turned the airplane too closely to complete the turn, most likely because he

allowed the bowl area to define the dimensions of the turn. Because of the unnecessary tightness of the turn and the steep bank angle that was required to prevent overshooting the runway, the airplane's critical angle of attack was exceeded, resulting in an accelerated stall (which has load factors above 1 G and a stall speed higher than the airplane's 1-G stall speed) and a subsequent loss of control of the airplane.

The pilot's logbook revealed that he logged almost all his 344 hours of total flight experience during or before 2007, with most of those hours logged between 1983 and 1992. Thus, the gap in the pilot's flight experience, his limited recent flight experience, and the limited instruction that he received after purchasing the accident airplane did not prepare him for the challenges associated with the planned flight or the diversion.

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 while maneuvering to land, which resulted in an accelerated stall and the pilot's subsequent loss of control. Contributing to the accident was the gap in the pilot's flight experience, his limited recent flight experience, and his limited instruction in the accident airplane.

Findings

Aircraft	(general) - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Personnel issues	Recent experience - Pilot
Personnel issues	Training with equipment - Pilot
Personnel issues	Cardiovascular - Pilot

Factual Information

History of Flight

Enroute-cruise	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On August 9, 2017, about 1025 mountain daylight time, a Piper PA-22-150 airplane, N3664Z, was substantially damaged when it impacted terrain near Las Vegas, New Mexico. The private pilot was fatally injured. The airplane was privately owned and was operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed in the area, and no flight plan was filed for the flight, which departed Dalhart Municipal Airport (DHT), Dalhart, Texas, at 0640, and was en route to Santa Fe Municipal Airport (SAF), Santa Fe, New Mexico.

The pilot had recently purchased the accident airplane and took possession of it in Tennessee. On August 3 and 4, the pilot received 1.5 hours of local instruction in the accident airplane. According to personnel at the DHT fixed base operator, the pilot departed DHT for SAF the day before the accident but returned due to weather. The pilot again departed for SAF the morning of the accident.

The pilot was not in contact with air traffic control during the flight; however, a search of radar data found targets correlated to the accident airplane. The data captured the airplane as it departed from DHT and flew southwest until it passed Obar, New Mexico, when it turned west. After passing Bell Ranch, New Mexico, the airplane continued west, then northwest. The airplane made several large s-turns and flew east of San Miguel Ranch Airport (NM53) before turning north and continuing a right turn until radar contact was lost, as shown in the figure below. The last radar return was about 1.4 miles southwest of runway 4 at NM53. A search was initiated after the airplane was reported overdue, and the wreckage was located on August 11. The density altitude at the accident location was calculated to be about 8,500 ft.

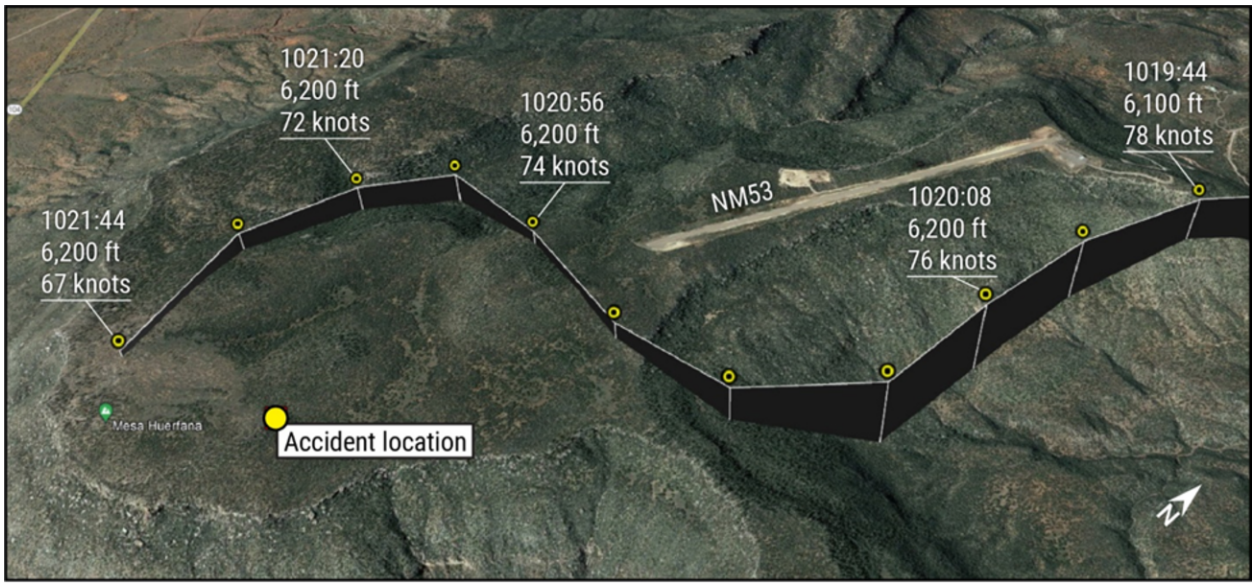

Figure. Accident site in relation to flight track and runway.

Pilot Information

Certificate:	Private	**Age:**	70,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 22, 2017
Flight Time:	(Estimated) 344.8 hours (Total, all aircraft), 19.1 hours (Total, this make and model), 10.1 hours (Last 90 days, all aircraft), 10.1 hours (Last 30 days, all aircraft)		

The pilot's logbook was found in the wreckage. His most recent flight review was completed on May 22, 2017, in a Cessna 172. The pilot did not hold a current Federal Aviation Administration (FAA) medical certificate and was operating under the provisions of BasicMed. The pilot's logbook revealed that he logged almost all his 344 hours of total flight experience during or before 2007, with most of those hours logged between 1983 and 1992. His most recent BasicMed medical examination was conducted on May 9, 2017. The pilot's previous FAA medical certificate was issued on May 17, 2012.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3664Z
Model/Series:	PA 22-150 160	**Aircraft Category:**	Airplane
Year of Manufacture:	1960	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	22-7562
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 3, 2017 Annual	**Certified Max Gross Wt.:**	2000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2495.66 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	O-320-A2B
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

A review of the airplane's logbooks did not find any record of significant maintenance issues. Notes found in the wreckage indicated that the pilot departed on the accident flight with full fuel at a tachometer time of 2,509.08 hours. The airplane’s 1-G stall speed was 43 knots.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KLVS,6874 ft msl	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	10:05 Local	**Direction from Accident Site:**	291°
Lowest Cloud Condition:	Scattered / 1100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	None /
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.31 inches Hg	**Temperature/Dew Point:**	19°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	DALHART, TX (DHT)	**Type of Flight Plan Filed:**	None
Destination:	SANTA FE, NM (SAF)	**Type of Clearance:**	None
Departure Time:	06:40 Local	**Type of Airspace:**	Class G

No significant weather was recorded in the vicinity of the accident.

Airport Information

Airport:	SAN MIGUEL RANCH NM53	**Runway Surface Type:**	
Airport Elevation:	6300 ft msl	**Runway Surface Condition:**	
Runway Used:	04	**IFR Approach:**	None
Runway Length/Width:	5600 ft / 100 ft	**VFR Approach/Landing:**	None

NM53 was a private airfield located about 73 miles west of SAF and had no services available.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.486946,-104.593612

The wreckage came to rest inverted in a wooded area in mountainous terrain. Portions of the right wing suspended in a tree; near the tree's base was a small crater filled with rain water, and the airplane's propeller was located in the crater. Areas of the cockpit contained an odor of fuel.

Examination of the flight controls did not identify any preimpact anomalies. Both propeller blades displayed leading edge damage and polishing. One blade displayed s-bending and curling, and its leading edge displayed gouges and deformation.

The airplane was recovered to a secure facility in Phoenix, Arizona. An examination of the engine did not reveal any preimpact anomalies.

Medical and Pathological Information

The State of New Mexico, Office of the Medical Investigator, Albuquerque, New Mexico, performed an autopsy of the pilot. The pilot's heart was enlarged and weighed 470 grams (average heart weight given the pilot's weight is 387 grams) with mild four chamber dilation. The proximal left anterior descending coronary artery had 90% stenosis, and both the circumflex and right coronary arteries had 50% stenosis. Fibrosis was identified on the left ventricular free wall. Left concentric ventricular hypertrophy was mentioned, but the recorded wall thicknesses were average. Microscopy demonstrated a focus of increased fibrosis with cardiac myocyte dropout consistent with a scar. The remaining heart had increased interstitial and perivascular fibrosis. Due to the severity of injuries, a detailed examination of the brain could not be conducted. The report listed the cause of death as blunt force injuries.

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens of the pilot. Testing identified ethanol at 0.151 gm/hg in muscle, and 0.037 gm/hg in liver tissue. Another alcohol commonly produced

in tissues after death, N-propanol, was detected in muscle. In addition, metoprolol was found in lung and muscle. Specimens were marked as putrefied.

Ethanol is the intoxicant commonly found in beer, wine, and liquor. It acts as a central nervous system depressant. Because ingested alcohol is distributed throughout the body, levels from different postmortem tissues are usually similar. Ethanol may also be produced in body tissues by microbial activity after death. In these cases, levels among different tissues tend to vary considerably. The alcohol levels in the pilot's tissues are consistent with postmortem production.

Metoprolol, doxazosin, and losartan were found among the pilot's belongings at the accident site. Metoprolol is a blood pressure medication that can also help prevent recurrent heart attacks. It is not generally considered impairing and is commonly sold with the names Lopressor and Toprol. Doxazosin and losartan were not detected in the toxicology. Both medications are used in the treatment of high blood pressure.

Additional Information

The FAA's *Airplane Flying Handbook* (FAA H-8083-3B) states the following:

At the same gross weight, airplane configuration, CG [center of gravity] location, power setting, and environmental conditions, a given airplane consistently stalls at the same indicated airspeed provided the airplane is at +1G (i.e., steady-state unaccelerated flight). However, the airplane can also stall at a higher indicated airspeed when the airplane is subject to an acceleration greater than +1G, such as when turning, pulling up, or other abrupt changes in flightpath. Stalls encountered any time the G-load exceeds +1G are called 'accelerated maneuver stalls.' The accelerated stall would most frequently occur inadvertently during improperly executed turns…or when overshooting a base to final turn.

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Steve Poiani; FAA FSDO; Albuquerque, NM
Original Publish Date:	July 8, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=95806