Aviation Investigation Final Report

Location:	Miami, Florida	**Accident Number:**	CEN18FA050
Date & Time:	December 10, 2017, 14:50 Local	**Registration:**	N7529S
Aircraft:	Smith Aerostar 601	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Before departing on the flight, the private pilot, who did not hold a current medical certificate, fueled the multiengine airplane and was seen shortly thereafter attempting to repair a fuel leak of unknown origin. The pilot did not hold a mechanic certificate and review of the maintenance logbooks revealed that the most recent annual inspection was completed 2 years before the accident. After performing undetermined maintenance to the airplane, the pilot reported to a witness that he had fixed the fuel leak. The pilot then taxied to the runway for takeoff. Witnesses reported that a large fuel stain was present on the ramp where the airplane had been parked; however, the amount of fuel that leaked from the airplane could not be determined.

The pilot aborted the first takeoff shortly after becoming airborne. Although he did not state why he aborted the takeoff, he told the tower controller that he did not need assistance; shortly thereafter, he requested and was cleared for a second takeoff. During the initial climb, the pilot declared an emergency and was cleared to land on any runway. Witnesses reported that the airplane was between 400 ft and 800 ft above the ground in a left bank and appeared to be turning back to land on an intersecting runway. They thought the airplane was going to make it back to the runway, but the airplane's bank angle increased past 90° and the nose suddenly dropped; the airplane subsequently impacted terrain. One of the pilots likened the maneuver to a stall/spin, Vmc roll, or snap roll.

Examination of the flight controls and engines did not reveal any anomalies that would have prevented normal operation. The position of the fuel valves was consistent with the fuel being shut off to the left engine. The fuel valves, with the exception of the left main valve, functioned when power was applied. The left main valve was intact, but the motor was found to operate intermittently. The amount of fuel found in the left engine injection servo was less than that in the right engine; however, the cylinder head temperatures and exhaust gas temperatures were consistent between both engines for the duration of the flight, and whether or to what extent the left engine may have experienced a loss of power could not be determined.

The available evidence was insufficient to determine why the pilot declared an emergency and elected to return to the airport; however, the airplane's increased left bank and nose-down attitude just before impact is consistent with a 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 loss of control while returning to the airport after takeoff for reasons that could not be determined based on the available information.

Findings

Not determined	(general) - Unknown/Not determined
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Initial climb	Miscellaneous/other
Approach	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On December 10, 2017, at 1450 eastern standard time, a Smith Aerostar 601 airplane, N7529S, collided with terrain shortly after takeoff from Miami Executive Airport (TMB), Miami, Florida. The pilot was fatally injured, and the airplane was destroyed by impact forces. The airplane was registered to the pilot who was operating it as a Title 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed and no flight plan was filed for the flight, which was originating at the time of the accident.

An employee of the flight school where the airplane was tied down stated that the pilot arrived about 1000 and began to preflight the airplane. About 1030, the pilot fueled the airplane, adding 105.2 gallons of 100LL aviation fuel. How the fuel was distributed between the airplane's three fuel tanks could not be determined. The pilot then taxied the airplane to the ramp in front of the flight school hangar where he kept a toolbox. The witness stated that the pilot was working on the airplane when he noticed a fuel leak and stated that he should have "fixed that" before he fueled the airplane. Both the employee and another witness stated that fuel was leaking from the aft fuselage belly area. They stated that the pilot had two or three 5-gallon orange buckets under the airplane to catch the fuel as he worked to stop the leak. Neither witness saw how much fuel was in the buckets or what the pilot did with the fuel. One witness asked the pilot if he fixed the problem, and the pilot responded that he had.

The pilot was cleared for takeoff from runway 31 at 1426; however, the pilot aborted the takeoff and landed the airplane back on the runway. The controller asked the pilot if he needed assistance, to which the pilot replied, "… not sure what happened just yet but so far so good." The pilot then requested to taxi back to the runway to take off again. The airplane was cleared to take off at 1447, and 32 seconds later, the pilot declared an emergency. The controller cleared the pilot to land on any runway.

Two pilots in an airplane waiting to take off from runway 31 stated that they did not notice anything unusual about the takeoff until they heard the pilot declare an emergency. They reported that the airplane was between 400 ft and 800 ft above the ground and in a left turn toward runway 9R. They stated that they thought the pilot was going to make it back to the runway, but then the left bank increased past 90° and the nose suddenly dropped. One of the pilots likened the maneuver to a stall/spin, Vmc roll, or snap roll-type maneuver. The airplane subsequently impacted a cornfield east of the approach end of runway 9R.

The following day, a 12-ft-by-16-ft stain was observed on the ramp where the airplane had been parked.

One of the witnesses stated that the stain was from fuel that leaked out of the airplane.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land; Multi-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:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	August 4, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1000 hours (Total, all aircraft)		

The pilot held a private pilot certificate with airplane single- and multi-engine land ratings. His most recent FAA first-class medical certificate was issued on August 4, 2015, with the limitation that he must wear corrective lenses. On the application for that medical certificate, the pilot reported 1,000 hours total flight experience, with 30 hours in the preceding 6 months. The medical certificate expired for all classes on August 31, 2017. The pilot's logbook was not available during the investigation and his flight time could not be determined. The pilot was not a certificated airframe and powerplant mechanic.

Aircraft and Owner/Operator Information

Aircraft Make:	Smith	**Registration:**	N7529S
Model/Series:	Aerostar 601	**Aircraft Category:**	Airplane
Year of Manufacture:	1974	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	61-0161-082
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	6001 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-S1A5
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The accident airplane was a six-place, turbo-charged twin-engine airplane with retractable landing gear. The airplane was powered by two Lycoming IO-540-S1A5 300-horsepower engines.

The pilot purchased the airplane on March 3, 1998, and had it advertised for sale at the time of the accident.

The last annual inspection recorded in the airframe, engine, and propeller logbooks was dated December 9, 2016. The airframe total time was listed as 3,571.7 hours. The left engine time since major overhaul (SMOH) was listed as 124.7 hours and the time SMOH for the right engine was 56.9 hours. The last entry in the airframe logbook was dated June 3, 2017, at which time the recorded airframe time was 3,576 hours.

METEOROLOGICAL INFORMATION

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dawn
Observation Facility, Elevation:	TMB,10 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	19:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.2 inches Hg	**Temperature/Dew Point:**	16°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Miami, FL (TMB)	**Type of Flight Plan Filed:**	None
Destination:	Miami, FL (TMB)	**Type of Clearance:**	VFR
Departure Time:	14:50 Local	**Type of Airspace:**	Class C

Airport Information

Airport:	MIAMI EXECUTIVE TMB	**Runway Surface Type:**	
Airport Elevation:	10 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	25.644443,-80.455833

The accident site was located in a cornfield about 0.90 mile northwest of the approach end of runway 9R. There was an odor of fuel at the accident site. Aerial photographs taken 2 days after the accident showed an area of blight surrounding the accident site.

The wreckage came to rest on a heading of 210°. The empennage was reportedly folded over the fuselage area and pulled back by first responders. The pilot's seatbelt was cut by first responders during

the extraction process. Both engines were buried 1.5 to 2 ft deep at a 45° angle. Portions of two propeller blades were visible on each engine.

The top of the cockpit was separated and the rest of the cockpit was destroyed. The throttle quadrant was separated from the surrounding structure. The fuel mixture and propeller levers were full forward. The throttle levers were broken off and the bases of the levers inside the quadrant were in the full-forward position. The instrument panel was fragmented. All of the fuel tank selector knobs and switches were either broken or missing, and their preimpact positions could not be determined. The left tank fuel quantity gauge indicated 10 gallons; however, the needle was loose. The fuselage tank gauge indicated 0 gallons and the needle was frozen in place. The right tank fuel quantity gauge indicated 12 gallons and the needle was frozen in place. The bladder fuselage fuel tank was ruptured.

The empennage was separated from the rest of the airplane. The vertical stabilizer, rudder, horizontal stabilizer, elevator, and respective trim tabs were intact and all remained attached to the empennage. The push-pull tubes for the elevator and rudder were disconnected and broken within the empennage.

The Janitrol heater was inside the empennage. The fuel line remained attached at the heater and the line was broken forward of the heater.

The fuel sump drain had broken out of the sump and was not located. The right side filter was clean. The left side filter contained a small amount of debris, which appeared to be cloth fibers. Examination of the fuel valves showed that the right main fuel valve was in the open position. The left main fuel valve, the left crossfeed valve, and the right crossfeed valve were in the closed position. The position of the valves was consistent with the fuel being shut off to the left engine and the right engine drawing fuel from the right fuel tank and the fuselage tank.

Examination of both engines did not reveal any mechanical failures or anomalies that would have precluded normal operation. The left engine fuel injection servo contained about 2 teaspoons of fuel and the right engine fuel injection servo contained about 2 ounces of fuel.

The fuel valves and fuel boost pumps were examined and functionally tested at the Aerostar facility in Hayden, Idaho. The fuel valves, with the exception of the left main valve, functioned normally when power was applied. The left main fuel valve was opened and internally intact. Power was again applied to the valve and the shaft of the motor drive gear was turned by hand. The motor began to operate intermittently; however, the gear housing immediately began to get hot.

The left engine fuel boost pump sustained internal impact damage, which prevented it from functioning when tested. The right engine fuel boost pump functioned when tested.

The airplane was equipped with an Insight GEM-1200 engine data monitor. The unit was sent to the National Transportation Safety Board Vehicle Recorder Laboratory for download. The unit records

exhaust gas temperatures (EGT) and cylinder head temperatures (CHT). The unit sustained significant impact damage, which rendered it inoperable. The memory chip was removed from the unit and placed in a surrogate unit for download. The unit contained data from 12 flights, including the accident flight. Data was recorded every 6 seconds.

Data for all recorded flights showed that the left engine No. 5 CHT recorded a constant value of 32° Fahrenheit (°F) and the right engine No. 4 CHT recorded erratic values ranging from 32°F to 1382°F. These parameters were considered erroneous. The other data points were relatively consistent between both engines.

MEDICAL AND PATHOLOGICAL INFORMATION

The Miami-Dade County Medical Examiner's Department, Miami, Florida, performed an autopsy of the pilot. The reported listed the cause of death as blunt force trauma.

Toxicology tests performed at the FAA Forensic Sciences Laboratory were negative for carbon monoxide and cyanide. The testing was negative for drugs in the testing profile. Ethanol was detected in muscle tissue at 46 (mg/dL, mg/hg). Because ethanol was not detected in other tissue, the finding was consistent with postmortem production.

Administrative Information

Investigator In Charge (IIC):	Sullivan, Pamela
Additional Participating Persons:	Anthony Saavedra; FAA; Miramar, FL Michael Childers; Lycoming ; Williamsport, PA
Original Publish Date:	November 6, 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=96449