National Transportation Safety Board
Aviation Accident Final Report

Location:	St. Petersburg, FL	**Accident Number:**	ERA12FA491
Date & Time:	08/01/2012, 1400 EDT	**Registration:**	N2761K
Aircraft:	SILVAIRE LUSCOMBE 8A	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General Aviation - Instructional		

Analysis

The sport pilot had recently purchased the accident airplane and was working with a flight instructor for familiarization because he had not flown during the past 30 years. The flight instructor stated that he and the pilot had flown seven or eight flights together before the accident flight and that the pilot had previously flown about 5 hours with another flight instructor. During the accident flight, the pilots took off from a runway intersection. The flight instructor stated that the engine seemed to be producing full power until the airplane reached an altitude of about 100 feet above the ground. At that point, the flight instructor noted an audible loss of rpm that was confirmed by the tachometer. The airplane began to descend, the pilot applied carburetor heat, and the flight instructor assumed control of the airplane. With insufficient runway remaining on which to land and obstacles at the end of the runway that made a straight-ahead off-airport landing hazardous, the flight instructor attempted to maneuver toward the ramp area adjacent to the runway. The airplane subsequently stalled, impacted the runway in a nose-down attitude, and came to rest inverted.

Postaccident examination of the airplane revealed no evidence of any preimpact mechanical failures or anomalies that would have precluded normal operation. The flight instructor stated that the takeoff was initiated with the carburetor heat off, despite a placard in the airplane requiring the use of carburetor heat during takeoff and landing. Although the weather conditions at the time of takeoff were conducive to the formation of carburetor ice at glide and cruise power at the time of the accident, it was not possible to determine whether carburetor ice was a factor in the accident. Weight and balance calculations revealed that the airplane was loaded about 68 pounds over its maximum allowable gross weight, and calculated density altitude at the airport about the time of the accident was more than 2,000 feet. Despite these factors, both of which would have adversely affected both the distance required for takeoff and the airplane's rate of climb once airborne, the pilots elected to conduct an intersection takeoff, which reduced the available runway takeoff distance by nearly 20% and also reduced the diversionary options available in the event of a loss of engine power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight instructor's and the pilot's failure to maintain airspeed after a partial loss of engine power after takeoff for reasons that could not be determined during postaccident examination, which resulted in an aerodynamic stall and loss of airplane control. Contributing to the accident were the pilots' decisions to operate the airplane above its maximum allowable gross weight and to perform an intersection takeoff.

Findings

Aircraft	Performance/control parameters - Not attained/maintained (Cause) Maximum weight - Capability exceeded (Factor)
Personnel issues	Lack of action - Instructor/check pilot (Cause) Decision making/judgment - Flight crew (Factor)
Environmental issues	High density altitude - Effect on operation
Not determined	Not determined - Unknown/Not determined

Factual Information

HISTORY OF FLIGHT

On August 1, 2012, approximately 1400 eastern daylight time, a Luscombe 8A, N2761K, was substantially damaged when it impacted the ground when control was lost during takeoff from Albert Whitted Airport (SPG), St. Petersburg, Florida. The private pilot/owner was fatally injured, and the flight instructor sustained serious injuries. Visual meteorological conditions prevailed, and no flight plan was filed for the flight, which was originating at the time of the accident. The instructional flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The flight instructor was interviewed following the accident, and also provided a written statement recounting the events of the accident flight. He stated that a preflight inspection of the airplane revealed no anomalies, and the engine start and pre-takeoff checks were performed with no discrepancies noted. The fuel tank was filled to capacity, containing 14 gallons of fuel. The flight was cleared for takeoff from runway 25 at the intersection with taxiway B, with the owner conducting the takeoff. The flight instructor reported that the carburetor heat control was in the off position for "maximum takeoff power," and that the engine was producing full power during the takeoff roll until it reached an altitude around 100 feet above ground level. Shortly thereafter, the flight instructor noted an audible loss of power that was confirmed by the tachometer, which varied from 1,800 to 2,100 rpm. He stated that the engine seemed to "roll back," and did not sputter or run rough. The airplane began to descend, the pilot/owner applied carburetor heat, and the flight instructor assumed control of the airplane. With insufficient runway remaining on which to land, and the presence of obstacles at the end of the runway straight ahead, the flight instructor attempted to maneuver the airplane towards the ramp to the south of the runway. The airplane subsequently impacted the runway in a nose-down attitude, and came to rest inverted. The flight instructor stated that he attempted to turn the fuel selector valve to the off position prior to egressing the airplane, but could not remember if he had successfully done so. The flight instructor then egressed, and assisted in extricating the pilot/owner from the wreckage.

Four witnesses observed the airplane as it was taking off. They all recounted that the airplane reached an altitude between 20-40 feet, before the engine began to "sputter" and "miss." One witness described the airplane rocking from side to side, at a slow airspeed, prior to making a "sharp" left turn, descending nose-first, and impacting the runway.

PERSONNEL INFORMATION

The pilot/owner held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. The pilot's logbooks were not recovered, and no determination of the pilot's total or recent flight experience could be made. His most recent Federal Aviation Administration (FAA) third-class medical certificate was issued in June, 1978.

The flight instructor held a commercial pilot certificate with ratings for airplane single- and multiengine land and sea, and instrument airplane; and a flight instructor certificate with ratings for airplane single- and multiengine, and instrument airplane. His most recent FAA second-class medical certificate was issued in December, 2011. Review of the flight instructor's logbooks indicated that he had accumulated approximately 940 hours of flight time at that

date.

The flight instructor stated that prior to purchasing the accident airplane, the pilot had not flown in over 30 years, and was in need of a flight review to obtain currency. He had completed "seven or eight" flights with the pilot in the weeks leading up to the accident. Prior to that, the pilot had flown around 5 hours with another flight instructor at SPG.

AIRPLANE INFORMATION

According to FAA airworthiness records, the airplane was manufactured in 1947, and registered to the owner in April 2012. The airplane was powered by a Continental A-65-8, 65-hp, reciprocating engine. Review of the airplane's maintenance logs revealed that its most recent annual inspection was completed on February 13, 2012, at a total time in service of 1135.6 hours. At the time of the accident, the airplane had accumulated approximately 19 hours since the most recent inspection.

Although the airplane held a standard airworthiness certificate, it met the definition of a Light Sport Aircraft as contained in Title 14 Code of Federal Regulations Part 1.1, making it eligible for operation by a pilot holding a valid drivers' license in lieu of an FAA-issued medical certificate.

According to weight and balance information contained in the airplane's maintenance logs, the airplane had an empty weight of 838 lbs, and a maximum allowable gross weight of 1,260 lbs. The autopsy report indicated that the pilot/owner's weight was 203 lbs. The weight of the flight instructor as reported on his most recent FAA medical certificate was also 203 lbs. The calculated total fuel weight was approximately 84 lbs at capacity, resulting in an estimated gross weight of 1,328 lbs at the time of the accident.

METEOROLOGICAL INFORMATION

The 1400 weather observation at SPG included winds from 260 degrees at 8 knots, 10 statute miles visibility, few clouds at 3,000 feet, temperature 30 degrees Celsius (C) dew point 25 degrees C, and an altimeter setting of 29.98 inches of mercury.

The icing probability chart indicates there was potential for carburetor icing at glide and cruise power at the time of the accident.

AIRPORT INFORMATION

Albert Whitted Airport was a tower-controlled, public-use airport equipped with two runways oriented in a 07/25 and 18/36 configuration. According to FAA records, runway 7/25 measured 3,677 feet in length and 75 feet in width. From the intersection with taxiway B, the point at which the flight instructor stated the takeoff was initiated, approximately 3,000 feet of runway takeoff distance available remained from runway 25. Obstructions included a 12-foot blast fence at the runway end, a street 5 feet from the runway end, and a 24-foot building 100 feet from the runway end.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest inverted approximately 100 feet from the blast fence at the departure end of runway 25. The initial impact point was identified by a ground scar approximately one and a half feet in length, located in the grass about one foot from the right edge of the runway. About 16 feet past the ground scar, on a heading of approximately 187 degrees magnetic, a small crater was observed in the runway surface. Two abrasions, dimensionally consistent with

the diameter and chord of the propeller, extended out from the crater. The airplane came to rest about 20 feet past the crater. The engine was displaced aft into the firewall and the cockpit area exhibited significant crush damage. Fuel staining was observed on the runway surrounding the airplane.

The propeller remained attached to the engine, and exhibited scratching and gouging along its leading edge. One blade exhibited slight s-bending approximately four inches from its tip. The engine spark plugs were removed and exhibited normal wear. The crankshaft was rotated by hand, and powertrain continuity was confirmed from the propeller to the rear accessory gears and to the valve train. The carburetor remained attached to the engine, but was impact damaged and void of fuel. The carburetor float bowl was absent of fuel, water, and debris. The float was undamaged, and the fuel intake screen was clear.

Flight control continuity was established from all flight controls to the cockpit area. The instrument panel, engine controls, and flight controls exhibited significant impact damage. The fuel selector valve was found in the off position, and continuity of the fuel system was confirmed from the fuselage tank to the fuel selector valve. No fuel remained in the tank. The carburetor heat control was found extended aft approximately 1 inch. The mixture control was in the full rich position, and the throttle control was in the full power position.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Medical Examiner District Six, Largo, Florida. According to the autopsy report, the cause of death was "blunt trauma."

Toxicological testing was performed on the pilot/owner by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. Review of the toxicological report revealed that Carvedilol was detected in the liver and blood, Citalopram was detected in the liver and blood, N-Desmethylcitalopram was detected in the liver and blood, and Tamsulosin was detected in the urine and blood.

ADDITIONAL INFORMATION

Given the atmospheric conditions, the calculated density altitude at the time of the accident was approximately 2,070 feet. According to the airplane's Owner's Handbook of Operation, "Due to reduced air density at higher altitudes wing lift and engine power are reduced with resulting performance reduction. Take-off and landing distances are increased and the rate of climb reduced."

Airworthiness Maintenance Bulletin No. 40, issued by the Civil Aeronautics Administration in February 1941, addressed the issue of engine failures on takeoff in Luscombe 8A airplanes. It stated:

"The cause of these failures is believed to be attributable to insufficient fuel pressure resulting from the backward surge in the fuel lines due to the forward acceleration of the airplane on takeoff. Tests have shown that the cutting-out tendency of the engine on takeoff can be eliminated by installing a revised fuel tank cap and following certain precautions during the takeoff operation."

As a result of this maintenance bulletin, the airplane was required to be equipped with a placard reading, "Full carburetor air heat required for takeoff and landing." This placard was installed on the accident airplane and found during postaccident examination to be in good condition. The TCDS also stated:

"The reason for this placard is that, during takeoff acceleration and initial high-angle-of-attack climb, the fuel flow may not be adequate for proper operation. Application of full carburetor heat in this case helps overcome the possible deficiency of fuel flow during takeoff. Carburetor ice is not a basic consideration in requiring this placard."

According to the Luscombe Endowment, which maintains a technical resource library and provides support to Luscombe owners and operators, the use of carburetor heat on takeoff and landing is required in 8A airplanes equipped with 65 or 75-hp engines and a single fuselage fuel tank. It states that, in low fuel conditions, (one-half tank or less), and on a cool day, it is possible to achieve an angle of climb wherein the engine fuel inlet is higher than the fuel tank outlet, resulting in a disruption of fuel flow to the engine. The use of carburetor heat effectively reduced the power output of the engine, thus prohibiting the airplane from achieving such an angle of climb.

History of Flight

Initial climb	Loss of engine power (partial) Aerodynamic stall/spin (Defining event) Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	**Age:**	79
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Sport Pilot None	**Last Medical Exam:**	06/01/1978
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Flight Instructor Information

Certificate:	Flight Instructor; Commercial; Private	**Age:**	37
Airplane Rating(s):	Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without Waivers/Limitations	**Last Medical Exam:**	12/01/2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 940 hours (Total, all aircraft), 0 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	SILVAIRE	**Registration:**	N2761K
Model/Series:	LUSCOMBE 8A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	5488
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	1260 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	A&C65 SERIES
Registered Owner:	On file	**Rated Power:**	65 hp
Operator:	On file	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KSPG, 7 ft msl	**Observation Time:**	1400 EDT
Distance from Accident Site:		**Condition of Light:**	Day
Direction from Accident Site:		**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Few / 3000 ft agl	**Temperature/Dew Point:**	30°C / 25°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	8 knots, 267°	**Visibility (RVR):**	
Altimeter Setting:	29.98 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	St. Petersburg, FL (KSPG)	**Type of Flight Plan Filed:**	None
Destination:	St. Petersburg, FL (KSPG)	**Type of Clearance:**	VFR
Departure Time:	1352 EDT	**Type of Airspace:**	Class D

Airport Information

Airport:	Albert Whitted Airport (KSPG)	**Runway Surface Type:**	Asphalt
Airport Elevation:	7 ft	**Runway Surface Condition:**	Dry
Runway Used:	25	**IFR Approach:**	None
Runway Length/Width:	3677 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal, 1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious		

Administrative Information

Investigator In Charge (IIC):	Allison N Diaz	**Adopted Date:**	01/13/2014
Additional Participating Persons:	Michael Singleton; FAA/FSDO; Tampa, FL		
Publish Date:	01/13/2014		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=84532		

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