



National Transportation Safety Board Aviation Accident Final Report

Location:	Cleburne, Texas	Accident Number:	CEN10LA425
Date & Time:	July 22, 2010, 11:00 Local	Registration:	N601AT
Aircraft:	Smith Aerostar	Aircraft Damage:	Destroyed
Defining Event:	Ground collision	Injuries:	1 Minor
Flight Conducted Under:	Part 91: General aviation - Ferry		

Analysis

After takeoff, the right engine experienced a loss of power followed by the left engine losing power. The pilot maneuvered the airplane toward the nearest open field and the airplane impacted terrain during landing, resulting in a circumferential split in fuselage near the aft pressure bulkhead.

The airplane was equipped with 4 fuel tanks: 2 located in each wing outboard of the engine nacelle (65-gallon capacity), 1 main fuselage tank (about 44-gallon capacity), and 1 auxiliary tank located in forward section of baggage compartment (45-gallon capacity). The airplane was capable of carrying 209.5 gallons usable fuel and the pilot stated that prior to departure he filled the main fuselage tank to capacity, added 20 gallons in the auxiliary tank and 25 gallons in each wing tank, which he equated to a total of 131 gallons on board. The fuselage contained two fuel filler necks, one for each fuselage tank (main and auxiliary). The auxiliary tank was clearly placarded with a red placard visibly standing out against a silver paint stripe; the main tank was not clearly placarded, with a red placard blending easily with red paint stripe.

A salvage retriever recalled that during recovery the left wing contained 17 gallons of fuel, the right wing contained 57 gallons of fuel, the main fuselage tank contained 2.5 gallons of fuel, and the auxiliary fuselage tank contained 28 gallons of fuel. A postaccident examination of the airplane and engines revealed no anomalies that would have precluded normal operation. The main fuselage tank and auxiliary fuselage tank were not breached and the fuel sumps contained check valves which prevent the back-flow of fuel from one fuel tank to another. Based on the evidence it is likely that the pilot exhausted the airplane's fuel supply in the main fuselage tank, which resulted in the loss of power to both engines.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A total loss of engine power due to fuel starvation as a result of the pilot's improper fuel management. Contributing to the accident were the critical fuel placards that were difficult to see due to the airplane's paint scheme.

Findings

Aircraft	Fuel - Incorrect service/maintenance
Aircraft	(general) - Not serviced/maintained

Factual Information

On July 22, 2010, approximately 1100 central daylight time, a Smith Aerostar 601P, N601AT, was substantially damaged when both engines lost power and the pilot was forced to land in a plowed field 2 miles south of Cleburne (CPT), Texas. Visual meteorological conditions prevailed at the time of the accident. The ferry flight was being conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91 without a flight plan. The pilot, the sole occupant on board, sustained minor injuries. The cross-country flight originated at CPT, and was en route to Mena (MEZ), Arkansas.

According to the pilot's accident report, he cycled both fuel selectors and "they both sounded normal through the 3 positions." He found the left engine starter drive engaged, "like someone tried to start (it) and it didn't start." The fuel sumps were drained. During the takeoff, "the fuel pressure came up a couple of pounds when turning on boost pumps, rpm came up to just above 2550, and manifold (pressure) came up to about 30.5 (inches), then back to 29.5 (inches) approximately. After takeoff and upon reaching 700 to 800 feet, the pilot retracted the landing gear and the right engine started losing power. The pilot wrote, "I turned off the boost pump. No power. Turned it back on. Switched to crossfeed on the right. Both boost pumps on. Still no power. Went back to on. Then the left engine lost power.

The pilot steered towards the nearest open field "and was barely able to avoid an automobile and trees and keep from stalling." The airplane impacted terrain near the intersection of Highway 171 and Johnson County Road 312. A television news photo showed a circumferential crack in the airplane's fuselage near the aft pressure bulkhead.

According to the Airplane Flight Manual (AFM) and Supplemental Type Certificate (STC) SA1608NM (Mechem, Inc.), the airplane was equipped with four fuel tanks: integral wet fuel tanks located, in each wing outboard of the engine nacelle (65 gallons total, 62 gallons usable); a rectangular bladder-type fuel tank, located between the rear cabin bulkhead and the forward bulkhead of the baggage compartment (43.5 gallons total, 41.5 gallons usable); an integral metal auxiliary fuel tank, located in the forward section of the baggage compartment (45 gallons total, 44 gallons usable). The airplane was capable of carrying 218.5 gallons of fuel, 209.5 gallons of which were usable.

In his accident report, the pilot said he filled the fuselage tank to capacity, 20 gallons was placed in the auxiliary tank, and 25 gallons was placed in each wing tank (a total of 113.5 gallons). The pilot said there was a total of 131 gallons on board.

An FAA inspector who went to the accident site said the fuel servos, which activate the fuel valves, operated normally when power was applied to the aircraft's electrical system and the fuel selectors were manipulated. The electric boost pumps also operated normally.

The pilot later sent the following note to the FAA inspector: "I have been trying to figure out why there was no fuel in the fuselage tank, and so much (fuel) in the right wing (tank). I'm not sure I turned the fuel shut off valves to OFF before I turned off the master switch. I guess I was a little shook up. With the right wing lower I believe it could gravity feed."

The airplane's insurance company hired a salvage retriever to recover the airplane and before it could be moved, the fuel had to be drained from the tanks. The retriever reported the left wing contained 17 gallons of fuel, the right wing contained 57 gallons of fuel, the main fuselage tank contained 2.5 gallons of fuel, and the auxiliary fuselage tank contained 28 gallons of fuel.

After the accident, Varsol was added to the main fuselage tank and auxiliary fuselage tank. Neither tank leaked. The fuel sumps contain check valves which prevent the back-flow of fuel from one fuel tank to another. Further examination revealed the fuselage contained two fuel filler necks, one for each fuselage tank (main and auxiliary). The auxiliary tank was clearly placarded with the red placard visibly standing out against the silver paint stripe. The main tank is not clearly placarded with the red placard blending easily with the red paint stripe.

History of Flight

Initial climb	Loss of engine power (total)
Emergency descent	Off-field or emergency landing
Landing	Ground collision (Defining event)

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	Age:	82, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	February 23, 2010
Occupational Pilot:	No	Last Flight Review or Equivalent:	February 18, 2009
Flight Time:	28000 hours (Total, all aircraft), 332 hours (Total, this make and model), 27500 hours (Pilot In Command, all aircraft), 57 hours (Last 90 days, all aircraft), 28 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Smith	Registration:	N601AT
Model/Series:	Aerostar 601P	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	61P-0032-095
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	Annual	Certified Max Gross Wt.:	6000 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:	Installed	Engine Model/Series:	IO-540-S1A5
Registered Owner:		Rated Power:	340 Horsepower
Operator:		Operating Certificate(s) Held:	None
Operator Does Business As:	Aeropremiere LLC	Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	CPT,854 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	11:05 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Broken / 2800 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	11 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	160°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.07 inches Hg	Temperature/Dew Point:	31° C / 23° C
Precipitation and Obscuration:			
Departure Point:	Cleburne, TX (CPT)	Type of Flight Plan Filed:	None
Destination:	Mena, AR (MEZ)	Type of Clearance:	None
Departure Time:	10:50 Local	Type of Airspace:	Class G

Airport Information

Airport:	Cleburne Municipal CPT	Runway Surface Type:	
Airport Elevation:	854 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	32.353889, -97.433891

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	Arnold L Thormeyer; FAA Flight Standards District Office; Fort Worth, TX
Original Publish Date:	April 7, 2011
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=76730

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