National Transportation Safety Board
Aviation Accident Final Report

Location:	Bartlesville, OK	**Accident Number:**	CEN12LA134
Date & Time:	01/13/2012, 1930 CST	**Registration:**	N524HW
Aircraft:	AERO COMMANDER 500-B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The pilot was en route on a positioning flight when the airplane's right engine surged and experienced a partial loss of power. He adjusted the power and fuel mixture controls; however, a few seconds later, the engine surged again. The pilot noted that the fuel flow gauge was below 90 pounds, so he turned the right fuel pump on. The pilot then felt a surge on the left engine, so he performed the same actions he as did for the right engine. He believed that he had some sort of fuel starvation problem. The pilot then turned to an alternate airport, at which time both engines lost total power. The airplane impacted trees and terrain about 1.5 miles from the airport. The left side fuel tank was breached during the accident; however, there was no indication of a fuel leak, and about a gallon of fuel was recovered from the airplane during the wreckage retrieval. The company's route coordinator reported that prior to the accident flight, the pilot checked the fuel gauge and said the airplane had 120 gallons of fuel. A review of the airplane's flight history revealed that, following the flight immediately before the accident flight, the airplane was left with approximately 50 gallons of fuel on board; there was no record of the airplane having been refueled after that flight. Another company pilot reported the airplane fuel gauge had a unique trait in that, after the airplane's electrical power has been turned off, the gauge will rise 40 to 60 gallons before returning to zero. When the master switch was turned to the battery position during an examination of another airplane belonging to the operator, the fuel gauge indicated approximately 100 gallons of fuel; however, when the master switch was turned to the off position, the fuel quantity on the gauge rose to 120 gallons, before dropping off scale, past empty. Additionally, the fuel cap was removed and fuel could be seen in the tank, but there was no way to visually verify the quantity of fuel in the tank.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The total loss of engine power due to fuel exhaustion and the pilot's inadequate preflight inspection, which did not correctly identify the airplane's fuel quantity before departure.

Findings

Aircraft	Fuel - Fluid level (Cause)
Personnel issues	Preflight inspection - Pilot (Cause)

Factual Information

On January 13, 2012, about 1930 central standard time, a twin-engine Aero Commander 500-B airplane, N524HW, experienced a loss of engine power during cruise flight near Bartlesville, Oklahoma. The airline transport rated pilot, sole occupant, received only minor injuries during a forced landing and the airplane was substantially damaged. The airplane was owned and operated by Central Airlines, Inc. Fairway, Kansas, under the provisions of 14 Code of Federal Regulations Part 91 as a positioning flight. Night visual meteorological conditions prevailed for the flight, which operated on an instrument flight rules flight plan. The flight originated from the Charles B. Wheeler Downtown Airport (KMKC), Kansas City, Missouri, about 1810, en route to the Cushing Municipal Airport (KCUH), Cushing, Oklahoma.

The pilot reported that he was at an altitude of 8,000 feet, just southwest of Bartlesville, when the right engine surged and lost partial power. He adjusted the power and mixture controls, which seemed to correct the problem; however, a few seconds later the engine surged again. The pilot noted that the fuel flow gauge was below 90 pounds, so he turned the right fuel boost pump on. The pilot added he then got a surge on the left engine, so he performed the same actions he did for the right engine and felt that he had some sort of fuel starvation problem. The pilot contacted air traffic control and started his turn to the Bartlesville airport (KBVO), at which time, both engines lost total power. The airplane impacted trees and terrain, about 1.5 miles from the airport. The pilot added that before he secured the airplane and turned the master battery switch off, the fuel gauge was still indicating 100 gallons.

The responding Federal Aviation Administration (FAA) inspector reported that the airplane received heavy damage during the collision with trees and terrain. The on-site examination of the airplane revealed that the airplane was sitting on its belly, with the main landing gear partly extended. The fuselage just aft of the wings was severely damaged, both the left and right wings were damaged, and the nose of the aircraft was damaged. A hole on the underside of the left wing root exposed the fuel tank bladder. The bladder appeared to have been breached; there was no evidence of a fuel leak on the ground, adjacent the wing.

The inspector added that before moving the airplane wreckage, he turned on the airplane's battery power and observed the fuel gauge. The fuel gauge moved from below "E" to just above "E", when power was applied. The inspector noted that about a gallon of fuel was captured from the aircraft, prior to the wreckage retrieval.

A company check pilot flew the aircraft on its previous flight on 11 January. The check pilot reported he ferried the airplane from Chicago back to KMKC, arriving with 50 gallons of fuel remaining. He added there were no mechanical problems with the airplane and that he verbally passed the airplane's fuel status to dispatch. The pilot also reported that the airplane fuel gauge had a unique trait; after the airplane's electrical power has been turned off, the gauge will rise 40 to 60 gallons before returning to zero.

The company's director of operations stated that the fuel consumption on the Aero Commander is about 15 gallons per hour, per engine.

Prior to the accident flight, the airplane was moved from the ramp to the company's hangar;

however, the pilot who taxied the airplane could not recall the amount of fuel on the airplane.

The company's route coordinator reported that he met the pilot on the day of accident flight and gave him the credit card for fuel and a ride to the hangar. The coordinator stated that he stayed by the airplane's door, while the pilot sat in the pilot's seat, turned on the master switch and checked the fuel. The coordinator stated that the pilot said the airplane had "120 gallons of fuel".

The FAA inspector examined a similar airplane to the accident airplane, at the company's facility in Cushing, Oklahoma. The inspector noted that when the master switch was turned to the battery position, the fuel gauge indicated approximately 100 gallons of fuel; however, when the master switch was turned to the off position, the fuel quantity on the gauge rose to 120 gallons, before dropping off scale empty. The inspector also removed the fuel cap and that he could see fuel in the tank, but there was no way of verifying how much fuel was in the tank.

A review of the operator's "Preflight Visual Inspection of the airplane – Aero Commander 500 B/U" checklist; included "fuel quantity – check level and security of fuel cap"; however, a specific method to check fuel quantity was not specified.

History of Flight

Enroute	Fuel exhaustion Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Airline Transport	**Age:**	52, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With Waivers/Limitations	**Last FAA Medical Exam:**	11/12/2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	10/26/2011
Flight Time:	8487 hours (Total, all aircraft), 3477 hours (Total, this make and model), 8425 hours (Pilot In Command, all aircraft), 139 hours (Last 90 days, all aircraft), 39 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AERO COMMANDER	**Registration:**	N524HW
Model/Series:	500-B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:		**Serial Number:**	1533-191
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:		**Engine Model/Series:**	TIO-540 SER
Registered Owner:	CENTRAL AIRLINES INC	**Rated Power:**	310 hp
Operator:	CENTRAL AIRLINES INC	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night
Observation Facility, Elevation:	KBVO	**Distance from Accident Site:**	
Observation Time:	1953 CST	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	Light and Variable /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	Variable	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.13 inches Hg	**Temperature/Dew Point:**	-4°C / -8°C
Precipitation and Obscuration:	No Precipitation		
Departure Point:	Kansas City, MO (KMKC)	**Type of Flight Plan Filed:**	Unknown
Destination:	Cushing, OK (KCUH)	**Type of Clearance:**	IFR
Departure Time:	1800 CST	**Type of Airspace:**	

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Craig Hatch	**Report Date:**	12/19/2012
Additional Participating Persons:	Pat Stevens; FAA FSDO; Oklahoma City, OK		
Publish Date:	12/19/2012		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=82688		