Aviation Investigation Final Report

Location:	Gulf Shores, Alabama	**Accident Number:**	ERA18LA186
Date & Time:	July 7, 2018, 09:20 Local	**Registration:**	N294AB
Aircraft:	Piper PA34	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	5 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot departed in the twin-engine airplane with an estimated quantity of fuel. While landing at the destination airport, the airplane bounced and the pilot aborted the landing. During the subsequent climb, the left engine surged several times before it lost all power. The pilot attempted to restore left engine power by placing the auxiliary fuel pump switch to "high" and selecting "crossfeed" on the left fuel selector, but restoration of continuous engine power was unsuccessful.

When the left engine stopped producing power, the stall horn sounded, and the controls "started to buffet." The pilot said that he had "no time" to consult the emergency checklist and considered multiple forced landing areas before he chose to land straight ahead into trees. The airplane came to rest upright with substantial damage to both wings and the fuselage. There was an odor of fuel at the scene, but there was no evidence of fuel or fuel spillage.

Examination and testing of the engines revealed no pre-impact mechanical anomalies that would have precluded normal operation. The airplane's best single-engine rate of climb given the conditions present at the time of the accident was about 280 ft per minute.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper preflight and in-flight fuel planning, which resulted in fuel exhaustion to the left engine and a total loss of engine power during an attempted go-around maneuver.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Landing-aborted after touchdown	Fuel exhaustion (Defining event)

On July 7, 2018, at 0920 central daylight time, a Piper PA-34-220T, N294AB, was substantially damaged during a forced landing to wooded terrain near Jack Edwards Airport (JKA), Gulf Shores, Alabama. The private pilot and four passengers sustained minor injuries. The airplane was privately owned and operated as a Title 14 *Code of Federal Regulations* (CFR) Part 91 personal flight. Visual meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the flight which departed Lafayette Regional Airport (LFT), Lafayette, Louisiana and was destined for JKA.

In a written statement, the pilot provided a detailed description of his preflight inspection, his performance of weight and balance calculations, and his loading of the airplane with golf clubs, baggage, and the passengers. The pilot visually checked for the presence of fuel, but did not measure the fuel in the tanks, and neither did he service them with additional fuel. He noted no anomalies and estimated that there were 30 gallons of fuel "per side prior to departure according to the fuel gauges."

The pilot reported no anomalies with the performance and handling of the airplane in his description of the flight until landing. Upon landing, the airplane began to "porpoise or oscillate," and after the third or fourth bounce, the pilot aborted the landing.

The pilot said that he pushed the throttle, propeller, and mixture levers "full forward" and retracted the landing gear when a positive rate of climb was established. Immediately after, the left engine "appeared" to lose power and was "surging." The airplane yawed to its left, and the right engine continued to operate "normally." The pilot attempted to restore left engine power by placing the auxiliary fuel pump switch to "high" and selecting "crossfeed" on the left fuel selector.

The left engine stopped producing power, the stall horn sounded, and the controls "started to buffet." The pilot said he had "no time" to consult the checklist, considered multiple forced landing areas, and eventually chose to land straight ahead into trees. The airplane came to rest upright with substantial damage to both wings and the fuselage.

The pilot held a private pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane. He reported 335 total hours of flight experience, of which 65 were in multiengine airplanes, and 33 hours were in the accident airplane make and model.

At 1415, the weather recorded at JKA included scattered clouds at 2,100 ft and calm wind. The temperature was 28°C, and the dew point was 23°C. The altimeter setting was 30.08 inches of mercury.

According to the an aircraft recovery specialist who recovered the airplane, an odor of fuel was detected at the site, but no fuel drained from either wing when each was separated from the airframe. No fuel-spillage remediation was required at the site after recovery of the airplane.

Data downloaded from the onboard JPI 760 engine data monitor revealed a profile consistent with the engine power surging and power loss on the left engine as described by the pilot.

The engines were examined in Mobile, Alabama, at the manufacturer's facility. The propeller was removed from the right engine due to impact damage. A club propeller was installed, and the engine was placed in a test cell. The engine started immediately, accelerated smoothly, and ran continuously without interruption. The engine was run through the manufacturer's test protocol with no anomalies noted.

A test run on the left engine was not performed due to separation of the propeller flange by impact. The engine was rotated by hand through the propeller governor drive pad, and continuity was established through the powertrain and valve train to the accessory section. Compression on each cylinder was confirmed using the thumb method. Internal engine timing was confirmed through index alignment on the camshaft and crankshaft gears. Magneto timing was confirmed using an electronic magneto synchronizer.

The components of the fuel system were bench-tested, and the demonstrated flow rates were within ranges necessary to sustain normal engine operation. Flow rates outside the nominal bench-test ranges were affected by airframe-specific, on-airframe adjustments.

The left and right magnetos were bench-tested and produced spark at all terminal leads. The No. 5 bottom terminal lead on the left magneto sparked at a cut in the lead consistent with impact damage.

Neither engine displayed any preimpact mechanical anomalies that would have prevented normal operation.

Interpolation of performance charts at the maximum allowable gross takeoff weight and atmospheric conditions consistent with those at the time of the accident revealed that the airplane's single-engine rate of climb was 280 ft per minute.

Pilot Information

Certificate:	Private	**Age:**	41,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	BasicMed Without waivers/limitations	**Last FAA Medical Exam:**	October 18, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	335 hours (Total, all aircraft), 33 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N294AB
Model/Series:	PA34 220T	**Aircraft Category:**	Airplane
Year of Manufacture:	1981	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-8133257
Landing Gear Type:	Tricycle	**Seats:**	
Date/Type of Last Inspection:	June 26, 2018 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	3277 Hrs as of last inspection	**Engine Manufacturer:**	Cont Motor
ELT:		**Engine Model/Series:**	TSIO-360 SER
Registered Owner:		**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KJKA,16 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	14:15 Local	**Direction from Accident Site:**	347°
Lowest Cloud Condition:	Scattered / 2100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	28°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lafayette, LA (LFT)	**Type of Flight Plan Filed:**	IFR
Destination:	Gulf Shores, AL (JKA)	**Type of Clearance:**	VFR;IFR
Departure Time:	07:45 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	JACK EDWARDS NATIONAL JKA	**Runway Surface Type:**	Asphalt
Airport Elevation:	17 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	09	**IFR Approach:**	None
Runway Length/Width:	6962 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Minor	**Latitude, Longitude:**	30.289722,-87.671669(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Nina McBride; FAA/FSDO; Birmingham, AL Kurt Gibson; CMI; Mobile, AL
Original Publish Date:	April 20, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97705