Aviation Investigation Final Report

Location:	Inverness, Florida	**Accident Number:**	ERA15LA166
Date & Time:	March 23, 2015, 15:45 Local	**Registration:**	N936B
Aircraft:	HAWKER BEECHCRAFT CORP G36	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While on an instrument flight rules flight in visual meteorological conditions, about 20 miles from the destination airport, rhe pilot requested radar vectors to the destination airport, then advised the air traffic controller that that there was a problem with the engine and asked for radar vectors to a closer airport. The airplane subsequently crashed in the yard of a residence about a mile from the closer airport; the airfram was substantiall damaged during the impact.

During recovery of the airplane from the accident site, there was no evidence of fuel spillage from the one compromised fuel tank; about 7 to 8 total gallons of fuel were recovered from the other three fuel tanks. Postaccident examination revealed no evidence of preimpact mechanical malfunction or failure of any airframe or engine components that would have precluded normal operation. Postaccident fuel consumption calculations based on fuel receipts and GPS data showed that the airplane had likely consumed all but the limited fuel that was recovered. Given this information, it is likely that there was insufficient fuel onboard for the flight and the pilot exhausted the airplane's usable fuel supply, which resulted in the subsequent total loss of engine power and a forced landing.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's inadequate fuel planning, which resulted in fuel exhaustion and a total loss of engine power.

Findings

Personnel issues	Fuel planning - Pilot
Aircraft	Fuel - Fluid level

Factual Information

History of Flight

Enroute-cruise	Fuel exhaustion (Defining event)
Enroute-cruise	Loss of engine power (partial)
Emergency descent	Off-field or emergency landing

On March 23, 2015, at 1545 eastern daylight time, a Hawker Beechcraft G36, N936B, was substantially damaged when it struck a residence during a forced landing near Inverness, Florida. The private pilot incurred minor injuries. Visual meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the flight, which originated from Marco Island Airport (MKY), Marco Island, Florida and was destined for Ocala International Airport (OCF), Ocala, Florida. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to air traffic control (ATC) voice communication information provided by the Federal Aviation Administration, along with position information downloaded from a handheld GPS receiver recovered from the wreckage, the pilot departed from MKY about 1425. The flight proceeded uneventfully, and at 1539, was given a radar vector toward an initial approach fix for the RNAV (GPS) RWY 18 instrument approach to OCF. About 1540, the pilot advised ATC, "we've got an engine problem, I see a runway off to my left, what is it?" The controller then advised the pilot that the airport he was referencing was Inverness Airport (INF), Inverness, Florida. The pilot responded that he believed the airplane would be able to reach its originally intended destination of OCF and asked to be routed directly there. The controller advised the pilot that INF was located to his 11-o'clock and 5 miles, while OCF was located to his 12-o'clock and 20 miles. The pilot again requested and was provided with a radar vector to OCF. By 1540, the airplane had descended to an altitude of 4,000 feet.

At 1541 the controller asked the pilot to report the number of persons aboard and the airplane's quantity of fuel remaining. The pilot stated that there was one person onboard, that the airplane had 3 hours of fuel remaining, and "we've got an engine that's cutting out…" The controller again offered that INF was located to the pilot's 9-o'clock and 4 miles, to which the pilot responded, "we're going there now." The controller subsequently provided the pilot with the runway orientation at INF, and cleared him for a visual approach. The pilot acknowledged the transmission, and no further communications were received from the pilot. The airplane's last recorded GPS position was at 1544, at a GPS altitude of 302 feet, about 0.4 nautical miles northeast of the accident site, and about 1.5 nautical miles north east of INF.

The pilot reported that he sustained a concussion during the accident and was unable to remember any details of the flight.

The airplane came to rest in the back yard of a residence. Examination of photographs provided by the Citrus County Sheriff's Department revealed that both wings and the fuselage were substantially damaged during the impact. While the airplane was being recovered from the accident, aircraft recovery

personnel reported that all of the airplane's fuel tanks appeared to have been compromised in some fashion, and that there were some cracks in the wingtip fuel tanks and that both main fuel tanks were breached. They also reported that there was no smell of fuel at the site. About 2 to 3 gallons of fuel were recovered from the left main fuel tank, while 1 gallon of fuel was recovered from the right main fuel tank.

After the airplane was recovered, 4 gallons of fuel were drained from the right wingtip fuel tank; the left wingtip fuel tank was breached and absent of fuel. The fuel selector valve was found positioned to the right main fuel tank, and both wingtip fuel tank transfer pump switches were found in the off position. The fuel strainer screen and strainer bowl were absent of debris or water.

The engine remained attached to the airframe through the right engine mounts, wires, and hoses, and had sustained damage consistent with impact. The crankcase remained intact and all six cylinders remained attached to their respective cylinder bays. Each of the engine's cylinders was inspected with a borescope. The internal components and piston heads displayed normal operating and combustion signatures, with the exception of the No. 2 cylinder exhaust valve, which showed a slightly irregular heat pattern; however, the valve was not burned. The crankshaft was rotated by hand and continuity was established between the crankshaft, camshaft, connecting rods, and associated components. During crankshaft rotation each of the cylinders displayed thumb compression and suction.

The oil sump remained intact; the oil gauge displayed 10 quarts of oil remaining in the oil sump. The oil filter was removed and the oil filter element was cut and visually inspected. There were no metallic deposits or contaminants noted within the filter pleats.

Examination of the fuel pump, throttle and fuel metering assembly, manifold valve, fuel nozzles, magnetos, ignition harnesses, spark plugs, and the intake and exhaust system components revealed no anomalies. When the engine's crankshaft was rotated by hand both magnetos produced a spark during impulse coupling operation. The impulse couplings of both magnetos released at approximately top dead center during the compression stroke of the No. 1 cylinder. All of the spark plugs were removed and each displayed significant wear (when compared to Champion Aviation Service Manual AV6-R). The fuel pump drive coupling remained intact, and disassembly of the fuel pump revealed that the internal components displayed normal operating signatures. The throttle and fuel metering assembly, as well as the fuel manifold valve, were disassembled and visually inspected. All of the internal components displayed normal operating signatures and the fuel screens were clear of contaminants. The fuel nozzles were removed and visually inspected, all were clear of any blockages.

The turbocharger remained partially attached to its mounting bracket; however, the turbocharger had partially broken free from the exhaust system. The compressor and turbine rotated freely. The turbocharger controller, wastegate, and overboost valves remained attached and were undamaged, and no anomalies were noted with any of the components.

The three blade, variable pitch propeller remained attached to the crankshaft and all three blades remained within the hub. All three propeller blades displayed minimal chordwise scratches; two of the blades displayed aft bending deformation and the third blade did not display any significant bending deformation. The propeller governor remained attached to its installation point and sustained impact damage. The propeller control arm was capable of normal movement, and no anomalies noted.

Review of fueling receipts revealed that on March 6, 2015, the airplane was serviced with 42.4 gallons of fuel, with the instructions, "top off inboards [main]" fuel tanks.

GPS data revealed that, on the morning of March 7, 2015, the airplane departed Dothan Regional Airport (DHN), Dothan, Alabama, and flew to Ormond Beach Municipal Airport (OMN), Ormond Beach, Florida. The flight duration was about 1.61 hours.

A fueling receipt from OMN showed that the airplane was serviced with 28.5 gallons of fuel on the afternoon of March 7, with the fueling instructions, "top main not tips."

The GPS data showed that the airplane departed OMN on the morning of March 12 and flew to Wing South Airpark (FA37), Naples, Florida. The flight duration was 1.41 hours. About 45 minutes after arriving at FA37, the airplane departed for Lakeland Linder Regional Airport (LAL), Lakeland, Florida, with a GPS-recorded flight duration of 0.91 hours.

A fueling receipt from LAL showed that the airplane was serviced with 30 gallons of fuel on the afternoon of March 12, with the instructions, "15 in each main, 30 total."

The GPS data showed that the airplane subsequently departed from LAL later that afternoon and flew to FA37, with a flight duration of 0.83 hours.

The final recorded GPS track log began on the day of the accident at 1412, with the airplane positioned in parking area at FA37. The airplane subsequently departed at 1422 and climbed to about 6,000 ft GPS altitude. About 1539, the airplane began descending below 6,000 ft.

The airplane was equipped with a Continental Motors IO-550-B39B engine that had been modified through supplemental type certificates to incorporate a turbocharger. A representative of the company that provided the modifications prepared a fuel consumption estimate utilizing the GPS data and fuel records between the time the airplane was service with fuel at DHN and the accident flight. The estimate showed that the airplane had been operated about 6.17 hours of flight time, and of the 132.5 available gallons of fuel, the engine would have consumed at least an estimated 124.5 gallons.

Pilot Information

Certificate:	Private	**Age:**	67,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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3	**Last FAA Medical Exam:**	November 1, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	HAWKER BEECHCRAFT CORP	**Registration:**	N936B
Model/Series:	G36	**Aircraft Category:**	Airplane
Year of Manufacture:	2007	**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	E-3774
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	3650 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	CONT MOTOR
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-550-B39B
Registered Owner:	ASSOCIATED PACKAGING INC	**Rated Power:**	300 Horsepower
Operator:	ASSOCIATED PACKAGING INC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KINF,50 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	15:35 Local	**Direction from Accident Site:**	238°
Lowest Cloud Condition:	Scattered / 2600 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 3500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	27°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	MARCO ISLAND, FL (MKY)	**Type of Flight Plan Filed:**	IFR
Destination:	OCALA, FL (OCF)	**Type of Clearance:**	IFR
Departure Time:	14:25 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	28.823055,-82.306114(est)

Administrative Information

Investigator In Charge (IIC):	Diaz, Dennis
Additional Participating Persons:	Michael Minner; FAA/FSDO; Tampa, FL Kurt Gibson; Continental Motors Inc.; Mobile, AL David Landreth; Tornado Alley Turbo, Inc.; Ada, OK George Braly; Tornado Alley Turbo, Inc.; Ada, OK Peter Basile; Textron Aviation; Wichita, KS
Original Publish Date:	December 3, 2020
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=90912