



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Gainesville, Texas	Accident Number:	CEN17LA105
Date & Time:	February 21, 2017, 00:20 Local	Registration:	N6343L
Aircraft:	American Aviation AA 1A	Aircraft Damage:	Substantial
Defining Event:	Fuel exhaustion	Injuries:	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a familiarization flight with the non-pilot-rated passenger, who had recently purchased the airplane. They flew to a nearby airport to practice touch-and-go landings. After completing about 15 landings, they proceeded to another airport to get fuel. About 5 minutes before reaching the airport, the passenger noticed that the fuel pressure gauge indicated 0 psi, but the engine was operating smoothly. The pilot turned on the electric fuel boost pump and the fuel pressure gauge returned to 5 psi. The boost pump remained on for the remainder of the flight. Upon arrival at the airport, a go-around was performed. The engine experienced a loss of power during the climb about 200 ft above ground level and he performed a forced landing to a field short of the runway.

Postaccident fuel consumption calculations revealed that the airplane likely contained about 1 gallon of fuel at the time of the accident, which would have been unusable. Examination of the fuel tanks revealed less than 1 cup of fuel in the left tank and no fuel remaining in the right tank. The fuel spill observed at the accident site by first responders was likely the 1 gallon of unusable fuel from the right tank, because the right wing was separated at the fuselage and its fuel line was fractured. No anomalies were noted with the engine and the propeller blades did not show any rotational signatures.

Although the pilot reported that he flew the airplane during the final approach and go-around, there were discrepancies in his statements that suggested that the non-pilot rated passenger was actually manipulating the airplane controls during the loss of engine power.

Probable Cause and Findings

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

The pilot's inadequate preflight and inflight fuel planning, which resulted in a total loss of engine power due to fuel exhaustion and subsequent forced landing in a field. Contributing to the accident was the pilot's delayed action in taking control of the airplane following the loss of engine power.

Findings

Personnel issues	Fuel planning - Pilot
Aircraft	Fuel - Fluid level
Aircraft	Fuel - Fluid management
Personnel issues	Qualification/certification - Passenger

Factual Information

History of Flight

Approach	Fuel exhaustion (Defining event)
Landing	Off-field or emergency landing

On February 21, 2017, about 0020 central standard time, an American Aviation AA-1A airplane, N6343L, made a forced landing short of runway 36 at Gainesville Municipal Airport (GLE), Gainesville, Texas. The private rated pilot sustained minor injuries, the passenger sustained serious injuries, and the airplane sustained substantial damage. The airplane was registered to and operated by a private individual under the provisions of 14 *Code of Federal Regulations* Part 91 as a personal flight. Night visual meteorological conditions prevailed during the accident and no flight plan had been filed. The cross-country flight originated from Denton Enterprise Airport (DTO), Denton, Texas about 2130.

The responding law enforcement officer reported that the passenger was seated in the right seat. Also, the pilot told the officer that he attempted to assist the passenger in flying the airplane when it began to descend following the loss of engine power.

The airport director responded to the accident site and reported that he spoke to the pilot who stated, "the engine quit on short final, the wing dropped, and [the pilot] grabbed the yoke and tried to straighten it out..." The airport director also spoke to a pilot rated first responder who told the airport director that he moved the fuel selector from RIGHT to OFF while at the accident site.

The Federal Aviation Administration (FAA) inspector spoke with the pilot on the phone, who stated that the passenger had recently purchased the airplane. The passenger, who was not a certificated pilot, asked the pilot to fly with him on a familiarization flight. They departed DTO and reportedly completed about 15 touch-and-go landings at North Texas Regional Airport (GYI), Sherman/Denison, Texas. They then departed GYI for GLE to get additional fuel for the airplane. They approached GLE from the north and intended to land on runway 18. During the final descent, the pilot, who claimed to be flying the airplane, observed a coyote on the runway, so he executed a go-around. During the go-around, the pilot stated that the engine lost power and he made a 180° turn back toward the runway because he did not want to land on the highway. The pilot did not remember in which direction the turn was made. The airplane was not able to make the runway, so the pilot made a forced landing to a field (figure 1).



Figure 1 – Accident site

The pilot provided a written statement and spoke with the NTSB Investigator-In-Charge on the phone. He stated that on February 19, 2017, he and the passenger, who owned the airplane, flew the accident airplane from DTO to GLE for dinner, the passenger added fuel to the airplane, then they returned to DTO. This was the last time the airplane was serviced with fuel. On February 20, 2017, he met the passenger at DTO and they departed for GYI before the DTO control tower closed. They arrived at GYI after the control tower had already closed. They performed about 8 touch-and-go landings with a short break after the fifth. They departed the pattern at GYI and proceeded to GLE for fuel. About 5 minutes before arriving at GLE, the passenger noticed that the fuel pressure gauge indicated 0 psi, but the engine was still operating smoothly. The pilot turned on the electric fuel boost pump and the fuel pressure gauge returned to 5 psi. The boost pump remained on for the rest of the flight. During the final approach and before landing the pilot, who again claimed to be flying the airplane, observed a coyote on the runway and executed a go-around. The engine experienced a loss of power during the climb while 150 to 250 ft above ground level. He stated that the passenger recalled that the engine lost power while on

left crosswind in the traffic pattern. The pilot reported that he turned and attempted to land on runway 36, but the airplane landed in a field about 200 to 300 ft short of the runway. He added that after the accident he saw fuel on the ground at the accident site.

The passenger provided a written statement for the investigation; in the statement he did not report seeing a coyote on the runway, only that the pilot saw one. He also reported that the first responders discussed fuel on the ground at the accident site as they worked on extracting him from the airplane. He added that the fuel selector was positioned to the right fuel tank.

Pilot Information

Certificate:	Private	Age:	40,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without waivers/limitations	Last FAA Medical Exam:	March 30, 2015
Occupational Pilot:	No	Last Flight Review or Equivalent:	January 23, 2016
Flight Time:	463 hours (Total, all aircraft), 31 hours (Total, this make and model), 421 hours (Pilot In Command, all aircraft), 61 hours (Last 90 days, all aircraft), 23 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:	Student	Age:	47,Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	None None	Last FAA Medical Exam:	July 22, 2015
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	16 hours (Total, all aircraft), 16 hours (Total, this make and model)		

On July 22, 2015, the passenger was denied an FAA medical certificate for reasons unknown. He reported 16 hours of total flight time.

Aircraft and Owner/Operator Information

Aircraft Make:	American Aviation	Registration:	N6343L
Model/Series:	AA 1A	Aircraft Category:	Airplane
Year of Manufacture:	1972	Amateur Built:	
Airworthiness Certificate:	Normal; Utility	Serial Number:	AA1A-0343
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:		Certified Max Gross Wt.:	1561 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:		Engine Model/Series:	O-235-C2C
Registered Owner:		Rated Power:	108 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The airplane was equipped with two wing spar fuel tanks, each with a capacity of 12 gallons for a total of 24 gallons. The usable fuel quantity was 22 gallons, and the unusable fuel was one gallon per tank. The pilot reported that the airplane had 20 gallons of fuel when they departed DTO.

On February 19, 2017, the airplane was serviced with 12.57 gallons of fuel. The pilot and passenger then flew the airplane from GLE to DTO, which was about a 15-minute flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	KGLE, 839 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	00:55 Local	Direction from Accident Site:	8°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.93 inches Hg	Temperature/Dew Point:	12°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	SHERMAN/DENISON, TX (GYI)	Type of Flight Plan Filed:	None
Destination:	Gainesville, TX (GLE)	Type of Clearance:	None
Departure Time:	00:30 Local	Type of Airspace:	Class E

Airport Information

Airport:	GAINESVILLE MUNI GLE	Runway Surface Type:	Asphalt
Airport Elevation:	845 ft msl	Runway Surface Condition:	Unknown
Runway Used:	36	IFR Approach:	None
Runway Length/Width:	6000 ft / 100 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 Minor	Latitude, Longitude:	33.643054,-97.199165(est)

The airplane came to rest upright facing east in a field about 150 yards south of runway 36 at GLE and was slightly right of the runway's extended centerline (figure 2). The initial impact point and subsequent debris path was oriented toward the northwest. One propeller blade was bent aft near mid span and the other blade was straight and unremarkable. The right wing had separated from the fuselage, folded upside down, and twisted aft toward the empennage. The right-side fuel lines to the wing were separated and no fuel was observed in the right wing fuel tank. The left wing remained attached to the fuselage. The FAA inspector drained the left fuel tank sump drain, which contained a few tablespoons of dirty liquid.



Figure 2 – Accident airplane right side

The airplane was recovered by a wreckage retrieval company. When the left wing was removed for transport, there was less than one cup of fuel recovered from the left fuel tank. The ring wing tank was completely empty.

The right fuel tank quantity indicator is located on the lower right panel between front right seat and the lower right side of the instrument panel. The indication ball was not visible in the gauge. The left fuel tank quantity indicator is in the same position, but on the left side of the airplane.

There were no preaccident anomalies noted with the airplane during the on-scene examination by the FAA inspector.

Tests and Research

According to the airplane's pilot operating handbook (POH), the cruise performance chart matched the checklist found onboard the airplane, which the pilot reported referencing. The climb and cruise performance numbers provided in the POH were used and extrapolated to calculate an estimated fuel consumption for the accident flight. The calculation used the most conservative numbers regarding gallons per hour (gph) and two different estimates for the number of touch-and-go landings performed based on the pilot and passenger's initial and follow-up statements. It is possible that the actual fuel consumption was higher than the estimated number used for this report.

The first fuel consumption calculation (figure 3) estimated 7 minutes per landing and 15 total landings. The estimated 85% power was used to account for the higher power setting needed during touch-and-go landings, which yielded an average fuel burn of 7.16 gph. This fuel consumption calculation estimated a total of 19 gallons used, which would have left less than 1 gallon remaining in the fuel tanks, none of which would have been considered usable. Based on this calculation, the total flight time was estimated to be 2 hours and 42 minutes.

The second fuel consumption calculation (figure 3) also used an estimated 7 minutes per landing and only 9 total landings to match the pilot and passengers' follow-up statements. The same 85% power setting and fuel burn of 7.16 gph was used. This fuel consumption calculation estimated a total of 14 gallons used which would have left less than 6.0 gallons remaining in the fuel tanks, 4.0 of which would have been considered usable. However, based on this calculation the total flight time was estimated to only be 2 hours.

Fuel burn calculation - N6343L 2/20-2/21/17						
Estimated 85% power for TnG landings					Ex. 1	Ex. 2
	Time (mins)	Time (hrs)	Power%	GPH	Gallons	Gallons
Starting fuel (according to pilot)					20.0	20.0
Engine start/taxi/run-up/takeoff to 2,500+ ft					-1.0	-1.0
DTO to GYI	35	0.5833	53	4.6	-2.7	-2.7
8 TnG landings + 1 full stop at GYI (est 7 min/landing - Ex.1)	63	1.05	85	7.16	-7.5	
14 TnG landings + 1 full stop at GYI (est 7 min/landing - Ex.2)	105	1.75	85	7.16		-12.5
Takeoff to 2,500+ ft					-1.0	-1.0
GYI to GLE	20	0.333	53	4.6	-1.5	-1.5
Go-around maneuver	2	0.0333	85	7.16	-0.2	-0.2
Estimated time	120--162 mins	2.0--2.7 hrs				
Estimated remaining					6.0	1.0
Estimated total burned					-14.0	-19.0

Figure 3 - Fuel consumption calculations

Administrative Information

Investigator In Charge (IIC):	Lindberg, Joshua
Additional Participating Persons:	Cristobal Diaz; Federal Aviation Administration; Irving, TX
Original Publish Date:	July 5, 2018
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=94731

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).