



Aviation Investigation Final Report

Location:	Palm Coast, Florida	Accident Number:	ERA22LA112
Date & Time:	January 31, 2022, 13:00 Local	Registration:	N597K
Aircraft:	Cessna 195	Aircraft Damage:	Substantial
Defining Event:	Fuel exhaustion	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and the pilot-rated passenger departed their home airport to fly to a nearby airport about 20 minutes away. The pilot stated that he did not add any fuel to the airplane before the flight, as he thought he had enough fuel for the intended 20-minute flight. He reported that before takeoff everything was normal. He took off, and upon reaching 1,000 feet above mean sea level (msl), he configured the airplane for cruise. The airplane was operating normally when, about 5 miles from the destination airport, the engine lost power. The propeller continued to windmill, but it produced no power. He attempted to restart the engine without success. The pilot declared an emergency and informed air traffic control (ATC) that he would be landing on an interstate. During the forced landing, the airplane's right wing contacted a truck, and the airplane came to rest inverted off the right side of the interstate, incurring substantial damage. The passenger said that he was worried about fire, and immediately tried to get out of the airplane. Once the passenger was out of the airplane, though, he did not see any fire or smoke, and there was no smell of fuel.

During the wreckage recovery, there was also no smell of fuel at the accident scene, with the exception of a slight smell of fuel near the engine. Additionally, no fuel could be recovered from the airplane. The postaccident examination of the airplane and engine also revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. Additionally, the fuel strainer and the carburetor float chamber were absent of fuel.

An engine monitor was installed on the airplane that recorded exhaust gas temperature (EGT), cylinder head temperature (CHT), and shock cooling rate. During the accident flight, it recorded a rapid decrease in EGT, a rapid increase in shock cooling, and a rapid decrease in CHT, all of which in combination were indications that were consistent with of a loss of fuel flow.

The passenger stated that after the accident the pilot was “absolutely confident” that he had enough fuel for the 20-minute flight, and that the pilot said his fuel totalizer showed 23 gallons. However, the airplane’s fuel totalizer required that a known fuel quantity be programmed at the beginning of the flight. If an accurate quantity had not been entered by the pilot at some previous point, the information indicated by the fuel totalizer would not have been correct.

Based on the available information, it is likely that the loss of power was due to the fuel system containing little or no usable fuel, as no fire occurred during the impact sequence, the passenger did not observe fire or smell fuel when he egressed, no fuel was able to be recovered on-scene during the wreckage recovery, the fuel strainer and carburetor float chamber were absent of fuel, and examination of the engine revealed no evidence of any preimpact failures or malfunctions which would have precluded normal operation. The circumstances of the accident were consistent with a total loss of engine power due to fuel exhaustion, which resulted from the pilot’s inadequate fuel planning and preflight inspection.

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 and preflight inspection, which resulted in a total loss of engine power due to fuel exhaustion.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot
Personnel issues	Preflight inspection - Pilot

Factual Information

History of Flight

Approach	Fuel exhaustion (Defining event)
Emergency descent	Off-field or emergency landing
Landing-flare/touchdown	Collision with terr/obj (non-CFIT)

On January 31, 2022, about 1253 eastern standard time, a Cessna 195 Airplane, N597K, was substantially damaged when it was involved in an accident near Palm Coast, Florida. The pilot and pilot-rated passenger received minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The airplane departed Spruce Creek Airport (7FL6), Daytona Beach, Florida, about 1239, destined for Flagler Executive Airport (FIN), Palm Coast, Florida.

The pilot stated that before the flight, he performed a normal preflight inspection and flight planning for the flight from 7FL6 to FIN. The pilot advised that he did not take on any fuel as he had enough for the intended flight. After boarding the airplane, the pilot started the engine. The start was normal, and all the instruments indicated everything was normal.

He taxied to runway 24 for takeoff, and while short of the runway he ran the engine at idle for about 5 minutes and verified all instruments were normal. Upon entering the runway for takeoff, he performed a complete run-up procedure and no abnormality was observed. He took off, and upon reaching 1,000 feet above msl, he configured the airplane for cruise.

About 5 miles south of FIN, the engine lost power. The propeller continued to windmill, but produced no power. The pilot attempted to restart the engine without success. The pilot declared an emergency and informed ATC that he would be landing on Interstate 95 (I-95).

While approaching and setting up for landing on I-95, the passenger informed the pilot that he had a semi-trailer truck on his right-side, so the pilot tried to maneuver to his left as much as possible. The right wing then contacted the truck, at which point the pilot lost control. The airplane cartwheeled and came to rest inverted off the right side of I-95.

According to the passenger, while the pilot performed the preflight inspection of the airplane the passenger chatted with some other pilots in the hangar; he did not see the pilot performing the preflight inspection of the airplane. After the preflight was complete, the pilot assisted the passenger in boarding the airplane and getting buckled into the 5-point harness. After engine start, the pilot paused for about 5 minutes to warm up the engine oil and then performed an engine runup. Everything seemed normal.

After takeoff, they turned north towards FIN and climbed to 1,000 feet. As they were approaching the area of the airport, the pilot contacted the control tower. Then they turned east towards the ocean, and the passenger started to talk about how nice it was. While he was speaking, the engine “rumbled,” and it was as if the pilot had throttled back. But the pilot said right away, “I did not do that” and turned towards the north. At this time, they were about 800 feet in altitude.

The pilot immediately committed to landing on I-95, as there were trees everywhere, and told the control tower that “We will be on the highway.” When they were getting ready to land on the highway, the passenger pointed out a truck. When they touched down, they hit the truck. The passenger then closed his eyes as the impact was very violent. When they came to rest, they were upside down and he was “dangling upside down.” The passenger said that he was worried about fire, and they tried to immediately get out of the airplane. Once the passenger was out of the airplane, he did not see any fire or smoke, and there was no smell of fuel.

The passenger advised that a lot of pilots from 7FL6 would go to FIN for lunch and to buy fuel, as it was about 50-cents-per-gallon cheaper than at 7FL6. He believed that the pilot was planning to get fuel there.

The passenger also advised that after the accident the pilot was “absolutely confident” that he had enough fuel for the 20-minute flight, and that the pilot said his fuel totalizer showed 23 gallons.

According to the lead recovery specialist, during the wreckage recovery, there was no smell of fuel on scene, except for a slight smell of fuel near the engine. Additionally, no fuel was recovered from the airplane.

The airplane was equipped with an onboard engine monitor that recorded exhaust gas temperature (EGT), cylinder head temperature (CHT), and shock cooling rate. The engine monitor’s device time was programmed by the pilot.

The airplane’s onboard engine monitor was downloaded by the National Transportation Safety Board (NTSB) Recorders Laboratory. The data extracted included 21 sessions from April 15, 2021, through January 31, 2022. All parameters were recorded at a rate of one sample every six seconds. The accident flight was the last flight of the recording, and its duration was approximately 25 minutes. The device began recording at an approximate device time (dt) of 12:42:46. The last recorded parameter was as at 13:07:40 dt on January 31, 2022.

Review of the extracted data from the accident flight indicated that after 13:06:00 dt, the EGT rapidly decreased, the shock cooling rate rapidly increased, and the CHT rapidly decreased.

The fuel totalizer would have measured with high resolution the amount of fuel that flowed into the engine. Before the flight, though, the pilot would have had to enter into the unit the known quantity of fuel aboard, and then it would keep track of all fuel delivered to the engine.

Examination of the airplane and engine revealed no preimpact malfunctions or failures that would have precluded normal operation. Additionally, the fuel strainer and the carburetor float chamber were absent of fuel.

Pilot Information

Certificate:	Airline transport; Commercial; Private	Age:	34, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	May 1, 2021
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	August 12, 2021
Flight Time:	4415 hours (Total, all aircraft), 253 hours (Total, this make and model), 2364 hours (Pilot In Command, all aircraft), 133 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft)		

Pilot-rated passenger Information

Certificate:	Private	Age:	56, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	BasicMed With waivers/limitations	Last FAA Medical Exam:	December 4, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 2447 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N597K
Model/Series:	195	Aircraft Category:	Airplane
Year of Manufacture:	1949	Amateur Built:	
Airworthiness Certificate:	Normal; Utility	Serial Number:	7403
Landing Gear Type:	Tailwheel	Seats:	5
Date/Type of Last Inspection:	July 24, 2021 Annual	Certified Max Gross Wt.:	3350 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	2673.9 Hrs as of last inspection	Engine Manufacturer:	Jacobs
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	R755-B2
Registered Owner:	On file	Rated Power:	275 Horsepower
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:	KFIN,33 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	12:50 Local	Direction from Accident Site:	38°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.19 inches Hg	Temperature/Dew Point:	18°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Daytona Beach, FL (7FL6)	Type of Flight Plan Filed:	None
Destination:	Palm Coast, FL (FIN)	Type of Clearance:	None
Departure Time:	12:38 Local	Type of Airspace:	Class G

Airport Information

Airport:	FLAGLER EXEC FIN	Runway Surface Type:	Asphalt
Airport Elevation:	33 ft msl	Runway Surface Condition:	Dry
Runway Used:	29	IFR Approach:	None
Runway Length/Width:	5500 ft / 100 ft	VFR Approach/Landing:	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	1 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	29.465151,-81.207648(est)

Preventing Similar Accidents

Prevent the Preventable with Careful Fuel Management (SA-067)

The Problem

Within fuel-related accidents, fuel exhaustion and fuel starvation continue to be leading causes. From 2011 to 2015, an average of more than 50 accidents per year occurred due to fuel management issues. Fuel exhaustion accounted for 56% of fuel-related accidents while fuel starvation was responsible for 35% of these accidents. Fuel exhaustion is running out of fuel whereas fuel starvation is having fuel onboard that doesn't reach the engine for reasons such as a blockage, improperly set fuel selector, or water contamination.

Running out of fuel or starving an engine of fuel is highly preventable. An overwhelming majority of our investigations of fuel management accidents—95%—cited personnel issues (such as use of equipment, planning, or experience in the type of aircraft being flown) as causal or contributing to fuel exhaustion or starvation accidents. Prudent pilot action can eliminate these issues. Less than 5% of investigations cited a failure or malfunction of the fuel system.

What can you do?

- Pilots should know how much fuel they have onboard at all times.
- During preflight inspection, measure or visually confirm the fuel quantity. Do not rely exclusively on fuel gauges.
- Know how much fuel you will need for a given flight.
- Make sure you have a fuel reserve for each flight.
- Know your engine's fuel burn rate and actively monitor the fuel burn rate for the entire time the engine is operating.
- Know your aircraft's fuel system and how it works.
- Review your aircraft's POH and use the appropriate checklists.
- Don't stretch your available fuel supply. Stop and get gas!

See <https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-067.pdf> for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	Renee Pedilla; FAA FSDO; Orlando, FL
Original Publish Date:	January 30, 2024
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=104580

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).