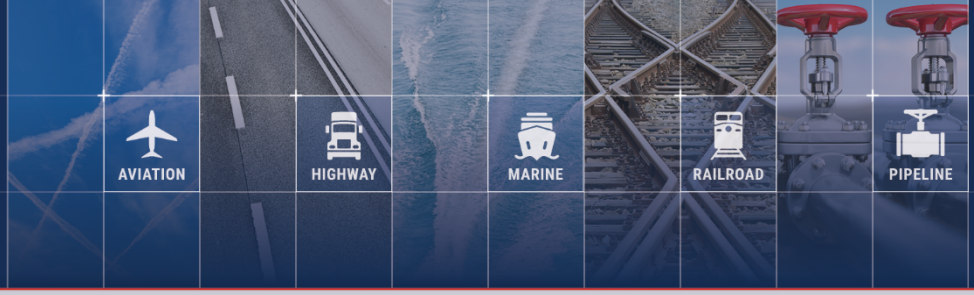

Aviation Investigation Final Report

Location:	Waverly, Tennessee	**Accident Number:**	ERA22LA037
Date & Time:	October 29, 2021, 16:00 Local	**Registration:**	N30SH
Aircraft:	Piper PA-30	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot departed on a cross-county flight in his twin-engine airplane and set the fuel selector to the auxiliary tanks. About 7-10 minutes into the flight, the auxiliary tanks ran out of fuel and the pilot switched the fuel selector handles to the main tanks, which the fuel gauge indicated were a ¼-full. The pilot then decided to land and purchase fuel. When the airplane was on a four-mile final approach to the diversion airport, the left engine stopped producing power. About 30 seconds later, the right engine stopped producing power. The pilot was unable to maintain altitude and made a forced landing to a field. The airplane struck a hay bale, which resulted in substantial damage to the fuselage and wings. Postaccident examination of the airplane revealed six fuel tanks were intact and empty of fuel. A fuel line fitting to the right auxiliary tank was observed to be loose, stained blue/green, and most likely had been actively leaking fuel. The amount of fuel lost due to this leak could be not determined.

The airplane was equipped with three fuel tanks (main, auxiliary and tip tank) in each wing, for a total of 120 gallons total (114 useable). Each tank was independent of each other, so the leak in the right auxiliary fuel tank would have only affected the fuel level in that tank. The pilot reported there was about 55 gallons of fuel onboard when he departed, and the airplane consumed an average of 15 gallons per hour. Based on this information, if the right auxiliary tank (15 gallons total) was empty due to the leak, there still should have been about 40 gallons of fuel onboard (or about 2.6 hours of fuel).

The pilot said that he did not visually check the fuel quantity prior to flight because the airplane "…does not have a way to visually check the fuel and know how much fuel you have in the tanks." However, the Pilot Operating Handbook states, that the pilot should visually check the fuel supply in each tank before flight. As such, even though the pilot thought he had sufficient fuel to complete his flight, postaccident examination of the airplane revealed the fuel tanks

were not breached and empty of fuel. A loose fuel line fitting in the right auxiliary fuel tank likely contributed to some unquantifiable loss of fuel from that tank. Had the pilot used the preflight checklist, and visually looked in all six fuel tanks, he would have seen that there was insufficient fuel in all of the tanks to complete the flight. As a result, both engines lost total power due to fuel exhaustion 20 minutes after takeoff, which resulted in a forced landing to field.

Probable Cause and Findings

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

The pilot's improper pre-flight fuel planning, which resulted in a total loss of engine power to both engines due to fuel exhaustion.

Findings

Aircraft	Fuel - Fluid management
Personnel issues	Decision making/judgment - Pilot
Aircraft	Fuel - Not serviced/maintained

Factual Information

History of Flight

Enroute	Fuel exhaustion (Defining event)
Enroute	Loss of engine power (total)
Emergency descent	Loss of engine power (total)
Landing-landing roll	Collision during takeoff/land

On October 29, 2021, about 1600 central daylight time, a Piper PA-30, N30SH, sustained substantial damage when it was involved in an accident near Waverly, Tennessee. The pilot and the two passengers were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot said he departed Music City Executive Airport (XNX), Gallatin, Tennessee, about 1540, on a cross-county flight in his twin-engine airplane and set the fuel selector to the auxiliary tanks. About 7-10 minutes into the flight, the auxiliary tanks ran out of fuel and the pilot switched the fuel selector handles to the main tanks, which the fuel gauge indicated were a ¼-full. The pilot elected to divert and land at the Humphrey's County Airport (0M5), Waverly, Tennessee, for fuel. When the airplane was on a four-mile final approach to land, the left engine stopped producing power, and the pilot feathered the engine. About 30 seconds later, the right engine stopped producing power. The pilot was unable to maintain altitude and made a forced landing to a field. The airplane struck a hay bale, which resulted in substantial damage to the fuselage and wings.

On-scene examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed the right wingtip fuel tank, auxiliary fuel tank, and main fuel tank were not breached and were absent of fuel. The left wingtip fuel tank separated (but was not breached) with the portion of the wing and was empty of fuel. The left auxiliary and main fuel tanks were not breached and empty of fuel. Each of the tanks respective fuel caps were secure.

After the airplane was recovered from the accident site and the wings were removed, the inspector re-examined the airplane and noted the fuel line fitting to the right auxiliary tank was loose, stained blue/green, consistent with a fuel leak. The amount of fuel lost due to this leak could not determined. The staining was traced down the main wing spar to where it exited at the wing root area and a large fuel stain was observed on the exterior of the wing root. No other evidence of fuel leakage was observed.

The airplane was equipped with three fuel tanks in each wing: a main tank (30 total/26 useable), 15-gallon auxiliary tank, and a 15-gallon wingtip tank, for a total of 120 gallons total (114 useable). Each tank was independent of each other, so the leak in the right auxiliary fuel

tank would have only affected the fuel level in that tank. The pilot reported that based on his recent fueling and flight history in the airplane, that he had about 55 gallons of fuel onboard when he departed. He said the airplane burned an average of 15 gallons per hour. Based on this information, if the right auxiliary tank was empty due to the leak, there still should have been about 40 gallons of fuel onboard (or about 2.6 hours of fuel).

The pilot said that he did not visually check the fuel quantity prior to flight because the airplane "…does not have a way to visually check the fuel and know how much fuel you have in the tanks." However, the Pilot Operating Handbook (POH) (section 4 – Normal Procedures – Walk Around Inspection) states, that the pilot should visually check the fuel supply in each tank before flight and to make sure each fuel cap is adjusted and secure. The pilot also reported that the fuel gauges for the main tanks were still indicating a ¼-full just before they both lost power.

The pilot said he was relatively new to flying this make/model airplane and thought the fuel gauges were fairly accurate. The pilot said that he would not have flown the airplane if he knew the right-wing auxiliary fuel line was leaking or that the fuel gauges were not indicating properly.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	31,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	September 14, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 12, 2021
Flight Time:	2044.6 hours (Total, all aircraft), 114.1 hours (Total, this make and model), 1893 hours (Pilot In Command, all aircraft), 53 hours (Last 90 days, all aircraft), 17.3 hours (Last 30 days, all aircraft), 1.1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N30SH
Model/Series:	PA-30	**Aircraft Category:**	Airplane
Year of Manufacture:	1966	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	30-1262
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	October 8, 2021 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	5662 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-320-B1A
Registered Owner:	MEDIC CHOPPERS LLC	**Rated Power:**	160 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KM02,756 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	15:55 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	900 ft AGL	**Visibility**	6 miles
Lowest Ceiling:	Broken / 700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	29.51 inches Hg	**Temperature/Dew Point:**	12°C / 11°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	Gallatin, TN (XNX)	**Type of Flight Plan Filed:**	None
Destination:	Waverly, TN	**Type of Clearance:**	VFR flight following
Departure Time:	15:40 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Humphrey's County 0M5	**Runway Surface Type:**	
Airport Elevation:	756 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing;Full stop

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	36.024276,-87.819159(est)

Administrative Information

Investigator In Charge (IIC):	Read, Leah
Additional Participating Persons:	Russ Standifur; FAA/FSDO; Nashville, TN
Original Publish Date:	September 7, 2023
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=104185