Aviation Investigation Final Report

Location:	Chattanooga, Tennessee	**Accident Number:**	ERA22LA413
Date & Time:	September 13, 2022, 11:32 Local	**Registration:**	N388TC
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Fuel starvation	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that the right landing gear contacted an unseen object while landing on an unimproved surface, which resulted in the tundra tire losing air pressure. After aborting the landing, he flew to an airport where he declared an emergency and advised air traffic control that he intended to land in the grass adjacent to the runway. The pilot made two low passes over a grassy area and, during climb-out from the second low pass, the engine lost all power. The pilot performed a forced landing to uneven terrain outside the airport fence, during which the airplane sustained substantial damage.

A postaccident examination and engine test run did not reveal any anomalies consistent with a preimpact failure or malfunction. Weather conditions at the time of the accident were conducive for serious icing at glide power. The pilot did not report using carburetor heat. It is likely that during multiple low passes prior to landing that carburetor ice accumulated, which resulted in a loss of engine power.

Probable Cause and Findings

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

A total loss of engine power due to of carburetor ice. Contributing to the accident was the pilot's failure to apply carburetor heat.

Findings

Environmental issues	Conducive to carburetor icing - Effect on equipment
Personnel issues	Use of equip/system - Pilot
Aircraft	(general) - Inoperative

Factual Information

History of Flight

Emergency descent	Off-field or emergency landing
Initial climb	Fuel starvation (Defining event)

On September 13, 2022, about 1132 eastern daylight time, a Cessna 172, N388TC, was substantially damaged when it was involved in an accident near Chattanooga, Tennessee. The airline transport pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, during a previous off-airport landing on an unimproved surface, the right tire impacted an object and was losing air pressure. He ultimately elected to land at Lovell Field Airport (CHA), Chattanooga, Tennessee. He declared an emergency with air traffic control and advised them he intended to make multiple low passes over a grass area adjacent to runway 20 to determine the best touchdown point. He made two low passes over the area he selected, initiating a go-around after the second low pass. During climbout, with the airplane about 350 ft above ground level and at 65 mph, the engine lost power. Engine power was briefly restored before being lost again. The airplane impacted uneven terrain outside the airport fence.

According to a Federal Aviation Administration inspector, an examination of the airplane revealed that the wings and forward fuselage sustained substantial damage.

Fuel was drained from the wings, 7 gallons of fuel was drained from the left wing, 1/2 gallon was drained from the right wing. The carburetor contained 5 ounces of fuel. All fuel drained was free of contaminants. A postaccident examination and engine test run did not reveal any anomalies consistent with a preimpact failure or malfunction.

According to the carburetor ice probability chart, the atmospheric conditions at the time of the accident were conducive to serious icing at glide power. FAA Special Airworthiness Information Bulletin (CE-09-35) – Carburetor Icing Prevention, stated that:
…pilots should be aware that carburetor icing doesn't just occur in freezing conditions, it can occur at temperatures well above freezing temperatures when there is visible moisture or high humidity. Icing can occur in the carburetor at temperatures above freezing because vaporization of fuel, combined with the expansion of air as it flows through the carburetor, (Venturi Effect) causes sudden cooling, sometimes by a significant amount within a fraction of a second. Carburetor ice can be detected by a drop in rpm in fixed pitch propeller airplanes and a drop in manifold pressure in constant speed propeller airplanes. In both types, usually there will be a roughness in engine operation.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	48,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	April 11, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 15, 2022
Flight Time:	5407.1 hours (Total, all aircraft), 837.1 hours (Total, this make and model), 2186.6 hours (Pilot In Command, all aircraft), 126.5 hours (Last 90 days, all aircraft), 27.3 hours (Last 30 days, all aircraft), 2.2 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	28,Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N388TC
Model/Series:	172	**Aircraft Category:**	Airplane
Year of Manufacture:	1956	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	29601
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	September 28, 2021 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3489 Hrs as of last inspection	**Engine Manufacturer:**	Franklin
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	6A-335B1
Registered Owner:	On file	**Rated Power:**	180 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:	CHA,688 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	34°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	25°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chattanooga, TN	**Type of Flight Plan Filed:**	None
Destination:	Chattanooga, TN	**Type of Clearance:**	VFR
Departure Time:		**Type of Airspace:**	Class C

Airport Information

Airport:	LOVELL FLD CHA	**Runway Surface Type:**	
Airport Elevation:	682 ft msl	**Runway Surface Condition:**	Dry;Holes;Rough;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	35.022064,-85.2084

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent
Additional Participating Persons:	Neal Thorne; FAA/FSDO; Nashville, TN
Original Publish Date:	October 5, 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=105927