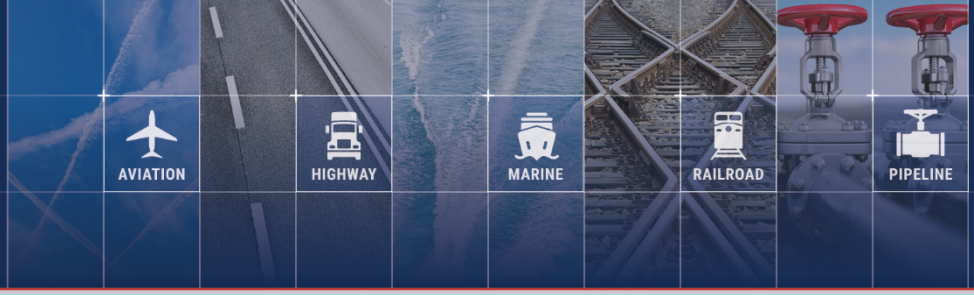

Aviation Investigation Final Report

Location:	Manassas, Virginia	**Accident Number:**	ERA24LA178
Date & Time:	April 14, 2024, 20:08 Local	**Registration:**	N8337X
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Fuel related	**Injuries:**	1 Minor, 1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that the airplane was in cruise flight at 5,500 ft mean sea level (msl) before he reduced engine power to comply with air traffic control descent instructions. The pilot did not apply carburetor heat at any time during the descent from 5,500 ft to 2,000 ft. At 2,000 ft msl, with the destination airport in sight, he applied throttle, but the engine did not respond. The pilot informed the tower controller that the “motor was unresponsive” and was cleared to land. The airplane touched down in a grassy area on airport property short of the runway, collided with a drainage culvert, and nosed over, resulting in substantial damage to the vertical stabilizer and the right-wing lift strut.

Although low compression was noted in two cylinders during the postaccident engine examination, that condition was attributed to leakage past the intake valves and likely would not have resulted in the total loss of engine power reported by the pilot. Review of weather information indicated that the airplane was operating in an area conducive to the development of serious carburetor ice at glide or idle engine power settings. It is likely that the carburetor accumulated ice during the prolonged descent without the use of carburetor heat, which resulted in the total 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 failure to apply carburetor heat before reducing engine power during a prolonged descent while operating in environmental conditions conducive to the development of carburetor ice, which resulted in a total loss of engine power due to carburetor icing.

Findings

Aircraft	Intake anti-ice, deice - Not used/operated
Personnel issues	Lack of action - Pilot
Personnel issues	Identification/recognition - Pilot
Environmental issues	Conducive to carburetor icing - Response/compensation

Factual Information

History of Flight

Enroute-descent	Fuel related (Defining event)
Emergency descent	Landing area undershoot
Landing-landing roll	Collision with terr/obj (non-CFIT)
Landing-landing roll	Nose over/nose down

On April 14, 2024, about 2008 eastern daylight time, a Cessna 172C, N8337X, was substantially damaged when it was involved in an accident near Manassas, Virginia. The private pilot was not injured, while the passenger sustained minor injury. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot was enroute to the destination airport at 5,500 ft mean sea level (msl). According to communications information from Federal Aviation Administration (FAA), the pilot was instructed by air traffic control to descend to, but remain at or above, 2,600 ft msl, and the pilot reported that he reduced throttle, but did not apply carburetor heat at any time during the descent. According to ADS-B data, the airplane began gradually descending from about 5,500 ft after 1959:09. The pilot was later cleared to descend to 2,000 ft msl, and while flying at that altitude with the destination airport in sight, he applied throttle to increase engine power, but the engine did not respond. About 2006, he informed the tower controller that the “motor was unresponsive” and the controller cleared the airplane to land on runway 16R. The airplane touched down in a grassy area on airport property short of the runway, collided with a drainage culvert, and nosed over, resulting in substantial damage to the vertical stabilizer.

Posataccident examination of the engine by a FAA inspector confirmed crankshaft, camshaft, and valvetrain continuity. Thumb suction and compression were noted in all cylinders, though it was low in two of the cylinders due to leakage past each intake valve. Examination of the air induction, ignition, exhaust, and fuel metering systems revealed no evidence of preimpact failure or malfunction. Impact damage to the carburetor precluded functional testing of the engine.

A High Resolution Rapid Refresh (HRRR) model sounding was created for the approximate time and location where the pilot initiated the descent. At 5,069 ft msl, the HRRR sounding indicated the temperature and dew point were about 16.8°C and about 0.4°C, respectively, with a relative humidity of 33 percent. At 6,076 ft msl, the HRRR sounding indicated the temperature and dew point were about 13.7°C and about -0.6°C, respectively, with a relative humidity of 37 percent.

Review of the icing probability chart contained within Federal Aviation Administration Special Airworthiness Information Bulletin CE-09-35 indicated that the atmospheric conditions at the time of the accident were “conducive to serious icing at glide [idle] power.”

FAA Advisory Circular 20-113 stated, "To prevent accident due to induction system icing, the pilot should regularly use [carburetor] heat under conditions known to be conducive to atmospheric icing and be alert at all times for indications of icing in the fuel system." The circular recommended that when operating in conditions where the relative humidity is greater than 50 percent, "…apply carburetor heat briefly immediately before takeoff, particularly with float type carburetors, to remove any ice which may have been accumulated during taxi and runup." It also stated, "Remain alert for indications of induction system icing during takeoff and climb-out, especially when the relative humidity is above 50 percent, or when visible moisture is present in the atmosphere."

A review of the airplane owner’s manual revealed that, although the “Let-Down” checklist did not specify the application of carburetor heat, the “Before landing” checklist did state to apply carburetor heat before closing the throttle.

Pilot Information

Certificate:	Private	**Age:**	73,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	BasicMed Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 21, 2022
Flight Time:	2329 hours (Total, all aircraft), 2329 hours (Total, this make and model), 2252 hours (Pilot In Command, all aircraft), 8 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N8337X
Model/Series:	172 C	**Aircraft Category:**	Airplane
Year of Manufacture:	1961	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17248837
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 2, 2023 Annual	**Certified Max Gross Wt.:**	2250 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	8614 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	C91A installed, activated, aided in locating accident	**Engine Model/Series:**	O-300-D
Registered Owner:	On file	**Rated Power:**	145 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	KHEF,192 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:56 Local	**Direction from Accident Site:**	136°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 15 knots	**Turbulence Type Forecast/Actual:**	Unknown / None
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	Unknown / N/A
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	25°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Morehead, KY (SYM)	**Type of Flight Plan Filed:**	None
Destination:	Manassas, VA	**Type of Clearance:**	VFR
Departure Time:	17:48 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Manassas Regional Airport/Harry P. Davis Field HEF	**Runway Surface Type:**	
Airport Elevation:	192 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Minor, 1 None	**Latitude, Longitude:**	38.726086,-77.521236

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Jason Lyuke; FAA/FSDO; Herndon, VA
Original Publish Date:	January 16, 2025
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=194084