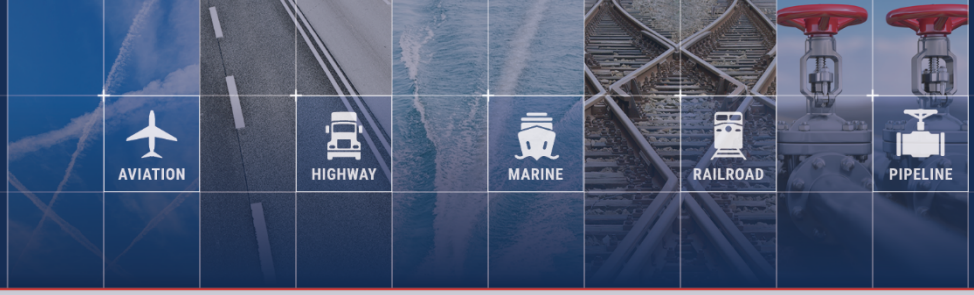

Aviation Investigation Final Report

Location:	Houston, Texas	**Accident Number:**	CEN19LA015
Date & Time:	October 27, 2018, 09:15 Local	**Registration:**	N3973L
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot reported that, as the airplane approached the runway after a short local, personal flight, the engine lost power. The pilot checked the fuel valve, mixture, and engaged the starter, but engine power was not restored. The pilot stated that the airplane was "headed directly toward a concrete revetment on the south bank" of a creek, so he banked the airplane left, and it subsequently impacted in the creek.

During recovery of the airplane, the fuel selector was found in the "both" position, and the throttle, mixture, and carburetor heat controls were found in the "forward" (off) position. Examination of the wreckage revealed no evidence of any preaccident mechanical malfunctions or failures that would have precluded normal operation.

The atmospheric conditions at the time that the engine lost power were conducive to serious icing at any power, moderate icing at cruise power, and serious icing at descent power. Given the evidence, it is likely that carburetor ice accumulated during the flight and that the pilot did apply carburetor heat, which resulted in a loss of all 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 while operating in an area conducive to carburetor icing, which resulted in a total loss of engine power on approach and subsequent forced landing into a creek.

Findings

Personnel issues	Lack of action - Pilot
Aircraft	Intake anti-ice, deice - Not used/operated
Environmental issues	Conducive to carburetor icing - Effect on operation

Factual Information

History of Flight

Enroute	Other weather encounter
Enroute	Loss of engine power (total) (Defining event)
Enroute	Attempted remediation/recovery
Emergency descent	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

On October 27, 2018, about 0915 central daylight time, a Cessna 172 G airplane, N3973L, impacted a creek near Houston, Texas, during a forced landing following a loss of engine power. The commercial pilot and two passengers were uninjured. The airplane sustained substantial wing damage during the forced landing. The airplane was registered to IFR Flyers LLC and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Day visual meteorological conditions prevailed in the area about the time of the accident, and the flight was not operated on a flight plan. The local flight originated from the West Houston Airport (IWS), near Houston, Texas.

According to the pilot's accident report, the purpose of the flight was an orientation flight for two Young Eagles passengers. After departing from runway 15, the pilot followed interstate highway 10 to highway 99, and then flew north about 5 miles. He then flew east and entered a final for runway 15. On short final the pilot added power, but the engine did not respond. He checked the fuel valve, mixture, and engaged the starter with no engine response. He stated, "I saw the aircraft was headed directly to the concrete revetment on the south bank of Bear Creek. I banked the aircraft left, striking the water nose down and with a left bank."

A representative of the recovery company forwarded pictures of the airplane during recovery. The fuel selector was positioned on the both position and the throttle, mixture, and carburetor heat controls were in their forward positions.

A National Transportation Safety Board investigator and a technical representative from the engine manufacturer examined the wreckage at a salvage yard. The airplane was at the salvage yard for several weeks before the examination.

The engine oil dip stick was removed, and water flowed from the dip stick tube. A visual inspection of the motor was conducted, other than evidence of water submersion, no obvious abnormalities were noted. The engine was not free to rotate. However, after removing water from the cylinders, the engine rotated freely. The sound of the magneto impulse couplings were noted. The engine oil was drained from the sump and appeared to be a mixture of oil and water. The removed sparkplugs appeared wet from water. A thumb compression test was completed on each cylinder; suction and compression were present on each cylinder. Each cylinder was inspected via borescope and no preimpact abnormalities were observed. Both left and right magnetos, and the carburetor were removed from the engine. The magnetos were rotated by an impact driver; spark was observed on each terminal, for both magnetos.

The carburetor finger screen was not contaminated. The carburetor bowl contained a dirty-brown liquid and when tested with water-detecting pasted; tested positive for water. A small amount of liquid, consistent with aviation fuel, was present in the accelerator pump section of the carburetor.

No preimpact mechanical anomalies were found during the engine examination.

At 0915, the recorded weather at the Houston Executive Airport, near Houston, Texas, was: Wind calm; visibility 10 statute miles; sky condition clear; temperature 18° C; dew point 16° C; altimeter 30.10 inches of mercury.

At 0853, the recorded weather at the David Wayne Hooks Memorial Airport, near Houston, Texas, was: Wind calm; visibility 9 statute miles; sky condition clear; temperature 15° C; dew point 15° C; altimeter 30.08 inches of mercury.

At 0853, the recorded weather at the Sugar Land Regional Airport, near Houston, Texas, was: Wind calm; visibility 10 statute miles; sky condition clear; temperature 16° C; dew point 14° C; altimeter 30.08 inches of mercury.

The recorded local temperature and dew point data near the time of the engine power loss was plotted on a carburetor icing chart. The charted data showed that the weather in the area was conducive to serious icing at any power to moderate icing at cruise power/serious icing at descent power.

The Pilot's Handbook of Aeronautical Knowledge, in part, states:

> When conditions are conducive to carburetor icing during flight, periodic checks should be made to detect its presence. If detected, full carburetor heat should be applied immediately, and it should be left in the ON position until you are certain that all the ice has been removed. If ice is present, applying partial heat or leaving heat on for an insufficient time might aggravate the situation. In extreme cases of carburetor icing, even after the ice has been removed, full carburetor heat should be used to prevent further ice formation. A carburetor temperature gauge, if installed, is very useful in determining when to use carburetor heat.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	83,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	January 18, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 29, 2017
Flight Time:	6300 hours (Total, all aircraft), 1500 hours (Total, this make and model), 5500 hours (Pilot In Command, all aircraft), 17 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3973L
Model/Series:	172 G	**Aircraft Category:**	Airplane
Year of Manufacture:	1966	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17254142
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 20, 2018 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3006.8 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O-300-D
Registered Owner:		**Rated Power:**	150 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:	KTME,168 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	09:15 Local	**Direction from Accident Site:**	263°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	18°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX (IWS)	**Type of Flight Plan Filed:**	None
Destination:	Houston, TX (IWS)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Airport Information

Airport:	WEST HOUSTON IWS	**Runway Surface Type:**	Asphalt
Airport Elevation:	111 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	15	**IFR Approach:**	None
Runway Length/Width:	3953 ft / 75 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	29.82361,-95.675552(est)

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Justin Kelly; Federal Aviation Administration; Houston, TX Kurt Gibson; Continental Motors; Mobile, AL
Original Publish Date:	April 20, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98552

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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.