



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Canoncito, New Mexico	Accident Number:	CEN19FA008
Date & Time:	October 16, 2018, 16:22 Local	Registration:	N9326G
Aircraft:	Cessna 182	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a cross-country flight when the airplane had a loss of engine power while descending through an area of precipitation and icing conditions. He was unable to restore normal engine operation using carburetor heat, which resulted in a forced landing. The airplane struck the terrain in a right wing down attitude and cartwheeled upon impact. Shortly after the accident, an individual observed several pieces of structural ice on the ground below the airplane's left wing leading edge.

After the accident, the engine demonstrated the ability to produce rated horsepower during an engine test. However, the carburetor heat control cable was found fractured and exhibited evidence of prolonged polishing wear against the cable sheathing. It is likely that the carburetor heat control cable had failed in overstress due to its reduced cross section from the polishing wear. Additionally, based on contaminants observed on the cable and fracture surfaces, the carburetor heat control cable had been fractured for an extended period before the flight.

The airplane was not approved for flight in known icing conditions; however, if inadvertently flown in icing conditions, the carburetor heat should be engaged to avoid a loss of engine power due to induction air filter icing and/or carburetor icing. It is likely the loss of engine power during the flight was due to an accumulation of ice on the induction air filter and/or to the carburetor, and the pilot was unable to restore engine power because the fractured control cable had rendered the carburetor heat inoperative. According to the airplane's operating handbook, pilots are to verify the proper operation of the carburetor heat during an engine runup before each flight.

A review of the airplane’s flight track and weather data indicated the airplane had flown through areas of precipitation that were consistent with freezing drizzle and supercooled liquid water droplets favorable for structural icing conditions. There was no record that pilot had received a weather briefing before the flight and, as such, his awareness of the icing conditions before the flight could not be determined.

Probable Cause and Findings

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

The partial loss of engine power due to induction system icing. Contributing to the accident was the fractured carburetor heat control cable, which rendered the carburetor heat inoperative.

Findings

Aircraft	Air intake - Fatigue/wear/corrosion
Aircraft	Air intake - Inoperative
Environmental issues	Conducive to structural icing - Effect on operation

Factual Information

History of Flight

Enroute-descent	Structural icing
Enroute-descent	Loss of engine power (partial) (Defining event)
Landing	Off-field or emergency landing
Landing	Dragged wing/rotor/float/other

On October 16, 2018, about 1622 mountain daylight time, a Cessna 182P airplane, N9326G, was substantially damaged when it was involved in an accident near Canoncito, New Mexico. The pilot and his passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to recovered GPS track data, the cross-country flight departed earlier in the day from Fullerton Municipal Airport (FUL), Fullerton, California, and made a planned fuel stop at Lake Havasu City Airport (HII), Lake Havasu City, Arizona. The manager of the fixed base operator at HII reported that the airplane was fueled with 30.9 gallons of 100 low-lead aviation fuel before it departed.

According to air traffic control (ATC) data and GPS track data, the flight departed HII about 1234 and climbed to an assigned cruise altitude of 19,000 ft mean sea level (msl) while continuing toward Albuquerque, New Mexico.

At 1608:25, the pilot established contact with Albuquerque Approach and reported descending through 14,600 ft msl to 10,000 ft msl. The controller relayed the current weather conditions for Double Eagle II Airport (AEG), Albuquerque, New Mexico, told the pilot to fly direct to the Albuquerque Very High Frequency Omni-Directional Range (ABQ VOR), and to expect the visual approach to runway 14 at AEG.

At 1612:19, the controller told the pilot that the airplane was on a southerly track, to turn to a 080° heading, and then resume a direct course to the ABQ VOR. At 1613:35, the controller asked the pilot to verify his heading. The pilot replied, "about seventy-two right now sir, we're going back to eighty in a minute." At 1613:43, the controller told the pilot to descend to maintain 9,000 ft msl. The pilot replied, "down to nine thousand, two six golf, yeah, we're just taking it real slow sir." At 1613:53, the controller told the pilot to advise if he was going to deviate from assigned headings. The pilot replied, "ah, you bet, thanks, we are just going around some clouds here." The controller then approved the pilot to make heading deviations to avoid clouds and to resume a direct course to the airport when able. At 1614:16, the pilot replied, "direct to the airport after deviations for two six golf, yeah, in

fact, we are just getting into some a little bit of precipitation here." The controller cleared the pilot to deviate as necessary to avoid the precipitation and to begin the descent to maintain 9,000 ft msl.

At 1616:05, as the airplane was descending through 10,000 ft msl, the pilot transmitted, "two six golf has got engine problems at this point." At 1616:14, the controller confirmed with the pilot that he was having engine issues. The pilot replied, "yes sir, um, can't really tell what's going on here." The controller replied, "ah, might be some icing, use caution there is high terrain below you, um, I-40, ah, Interstate 40 is located off your right wing and about nine, nine to ten miles." At 1616:38, the pilot replied, "yeah, we've broken out, we are under the clouds now, but, ah, yeah, I'm trying to get it to run here." The controller then told the pilot to make a right turn to a 120° heading to intercept Interstate 40. According to GPS track data, the airplane made a right turn to the east-southeast toward Interstate 40. At that point the airplane was at 9,000 ft msl, about 9.5 nautical miles (nm) west-northwest of Interstate 40, and about 16 nm west-southwest of AEG.

At 1617:33, the pilot transmitted, "and I've got my power back with the carb heat sir." At 1617:38, the controller told the pilot to maintain 8,200 ft msl because of high terrain below the airplane. At 1617:50, the pilot replied, "yeah, we will stay above eighty-two hundred, two six golf, thank you." At 1617:54, the pilot asked the controller, "can I be direct to alpha, ah, alpha echo golf right now?" The controller asked the pilot how his engine was running. The pilot replied, "right now I've got some power." The controller told the pilot that a direct course to AEG would be away from the interstate and asked if he was okay with that. At 1618:14, the pilot replied, "yeah, I think we will be okay." At 1618:20, the controller cleared the pilot direct to AEG. At that point, the airplane was about 14.5 nm west-southwest of AEG and descending through 8,200 ft msl on an east-southeast course. According to GPS track data, the airplane did not turn toward AEG and continued to the east-southeast.

At 1618:23, the controller told the pilot that there was an east/west road about 5.8 nm south of the airplane's current position. At 1618:52, the controller asked the pilot to ensure that the carburetor heat was turned on. At 1618:59, the pilot replied, "you bet, we do." At 1619:44, the controller asked if the pilot could maintain his own terrain and obstacle clearance at his current altitude. At 1619:48, the pilot replied, "yeah, I'm back to having my problems with the engine." At that point the airplane was descending through 7,600 ft msl on an east-southeast course.

At 1620:09, the controller asked the pilot of an air ambulance helicopter that was northeast of the airplane's position for assistance and issued a course change to intercept the airplane's position.

At 1620:45, the controller told the pilot that the airplane was about to descend below available radar coverage, told the pilot to climb, and issued the current altimeter setting of 30.25 inches of mercury. At 1620:58, the pilot replied, "yeah, 26G, we can't climb, I don't know what's going on, I'm gonna pick a dirt road down here somewhere [unintelligible]

wind." At 1621:05, the controller replied, "Cessna two six golf, winds at the airport are out of the east at one six knots, gusting two five knots, ah, suggest you, ah, find a flat spot out there, I don't know of any flat spots there, out there, use caution, there is a lot of ravines."

At 1621:27, the controller told the pilot that the airplane was 200-300 ft above the ground. At 1621:34, the pilot stated, "yeah [unintelligible] the engine just came back on." At 1621:37, the controller told the pilot that the interstate was about 3.5 nm directly ahead of the airplane's position. There was no recorded response from the pilot. The airplane briefly climbed to about 550 ft above the ground before it resumed a descent on an easterly course. At 1622:05, the airplane entered a right turn toward the south. At 1622:16, the final GPS track point was recorded at 5,922 ft msl (about 300 ft above terrain) and about 670 ft north of the initial point-of-impact with terrain.

The controller continued to issue radar vectors to the pilot of the air ambulance helicopter until the wreckage was discovered about 1628:22. The helicopter landed at the accident site about 1630. The helicopter pilot reported that upon landing at the accident site the cloud ceiling was about 1,800 ft above ground level (agl), the surface visibility was about 8 miles with light rain, and the outside air temperature was about 5° C. The medical crew proceeded to the wreckage and confirmed that there were no survivors. The helicopter pilot observed several pieces of mixed-ice on the ground below the airplane's left wing leading edge. He described the ice pieces as being rectangular, 12-18 inches long, 4-5 inches high, and 1/4 to 3/8 inch thick. He did not observe any ice on the airplane during his brief walk around the main wreckage. The helicopter pilot noted that weather was quickly deteriorating and that he quickly returned to the helicopter to prepare for departure.

Pilot Information

Certificate:	Commercial	Age:	68,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	October 30, 2017
Occupational Pilot:	No	Last Flight Review or Equivalent:	October 12, 2017
Flight Time:	6492.8 hours (Total, all aircraft)		

Pilot-rated passenger Information

Certificate:	Private	Age:	67,Female
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	None None	Last FAA Medical Exam:	July 8, 1991
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	111 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N9326G
Model/Series:	182 P	Aircraft Category:	Airplane
Year of Manufacture:	1971	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	18260866
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	October 4, 2018 Annual	Certified Max Gross Wt.:	2950 lbs
Time Since Last Inspection:	21 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	11200.23 Hrs at time of accident	Engine Manufacturer:	Continental
ELT:	C91 installed, not activated	Engine Model/Series:	O-550-F/TS
Registered Owner:		Rated Power:	285 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The airplane was powered by a 285-horsepower, 6-cylinder, Continental O-550-F/TS reciprocating engine, serial number 284691-R. The original fuel-injection system had been replaced with a carburetor when modified by Texas Skyways Supplemental Type Certificate No. SE09131SC. The engine had accumulated 201.23 hours since being installed on August 2, 2017. The airplane had accumulated 21.23 hours since the last annual inspection that was completed on October 4, 2018, at 11,179 total airframe hours.

According to the Cessna 182P Pilot's Operating Handbook (POH), the airplane was not approved for flight in known icing conditions. The POH indicates that carburetor heat should be used to avoid a loss of engine power due to air filter icing and/or carburetor icing while the airplane is operating in inadvertent icing conditions, and that "an unexplained loss

in manifold pressure could be caused by carburetor ice or air intake filter ice.” According to the Before Takeoff checklist, pilots are to verify the proper function of the carburetor heat before each flight. Additionally, an accumulation of airframe ice on the leading edge of the wing ¼ inch or greater will result in a significantly higher stall speed.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	AEG, 5837 ft msl	Distance from Accident Site:	12 Nautical Miles
Observation Time:	16:18 Local	Direction from Accident Site:	70°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Overcast / 4700 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	17 knots / 23 knots	Turbulence Type Forecast/Actual:	Convective / Convective
Wind Direction:	140°	Turbulence Severity Forecast/Actual:	Moderate / Moderate
Altimeter Setting:	30.25 inches Hg	Temperature/Dew Point:	7°C / -3°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	Lake Havasu, AZ (HII)	Type of Flight Plan Filed:	IFR
Destination:	Albuquerque, NM (AEG)	Type of Clearance:	IFR
Departure Time:	12:34 Local	Type of Airspace:	Class G

The National Weather Service (NWS) National Composite Radar Mosaic at 1620 depicted an area of light to moderate precipitation echoes surrounding the accident site with several west-to-east oriented bands located west and south of the accident site. There was no evidence of any organized strong convection or thunderstorms. Additionally, the NWS Aviation Weather Center (AWC) data indicated visual flight rules (VFR) conditions at the accident site with overcast ceilings between 3,700 and 5,500 ft agl, and that a large area of precipitation extended across western New Mexico and along the route of flight.

An upper air sounding for the Albuquerque area detected a low-level temperature inversion at 3,054 ft agl, and a lifted condensation level (LCL) about 5,300 ft agl that was associated with the cloud base. The freezing level was at 9,900 ft msl and supported a mixture of rime and mixed icing through 16,000 ft msl where the relative humidity exceeded 75%.

NWS weather radar base reflectivity images at 1607, 1614, and 1620 depicted a large area of light to moderate precipitation over the accident site and along the route of flight at altitudes between 13,000 ft msl and 19,000 ft msl. A review of the airplane’s flight track indicated the airplane had flown through precipitation echoes that were consistent with freezing drizzle and supercooled liquid water droplets favorable for structural icing conditions.

The NWS AWC Current Icing Products (CIP) analysis for 1600 indicated there was greater than 65% probability of icing conditions between 11,000 and 17,000 ft msl across Arizona and into western New Mexico. There was a 35% probability of icing in the Albuquerque area at 16,500 ft msl, and the probability of icing increased to over 75% between 11,000 and 13,000 ft msl. The CIP Icing Severity indicated light to moderate icing and the possibility of supercooled large droplets (SLD).

There were no Significant Meteorological Advisories (SIGMETs) or Center Weather Advisories issued at the time of the accident. The NWS had issued several Airmen's Meteorological Information advisories (AIRMETs) for mountain obscuration over most of Arizona and New Mexico, moderate turbulence below 18,000 ft msl, and moderate icing conditions between the freezing level and 21,000 ft msl. A separate AIRMET for instrument flight rules (IFR) conditions was also current over central and eastern Arizona, which included an earlier portion of the flight. The NWS Winds and Temperatures Aloft Forecast current for the flight indicated a freezing level between 9,000 and 10,000 ft msl.

About 30 minutes before the accident, several pilot reports (PIREPs) were filed for light to moderate rime icing conditions, and between 1552 and 2020 there were 9 PIREPs for trace to moderate rime icing conditions between 10,000 and 23,500 ft msl.

A search of official weather briefing sources indicated that the pilot had not received a weather briefing before the flight.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	35.071109,-107.03527

The accident site was in a sparsely populated area consisting of rolling desert terrain. The initial point-of-impact was where the right wingtip collided with the terrain. A shallow crater was located about 30 ft south of the initial impact point. The main wreckage was located about 110 ft south of the initial point-of-impact. The main wreckage consisted of the entire fuselage, both wings, empennage, engine, and propeller. The airplane came to rest on a north heading. There was no evidence of an inflight or postimpact fire. Flight control cable continuity was established from each flight control surface to its respective cockpit control.

The throttle was found full forward, the mixture control was extended about 2 inches, the carburetor heat control was extended about 2 inches, and the primer control was stowed and locked. The cabin heat control was extended about 1/2 inch. The pitot tube heat switch was turned on. The alternate static source control was extended about 1/2 inch.

The engine remained partially attached to the firewall. Engine control continuity was confirmed from the cockpit controls to the throttle arm and mixture control. The propeller remained attached to the propeller flange. All three propeller blades remained attached to the propeller hub. The first propeller blade exhibited a spanwise S-shape bend, the second propeller blade was relatively straight, and the third propeller blade was bent aft. Minor erosion was observed on the leading edges of the propeller blades near the blade tips; however, there was no evidence of leading edge gouges. A postaccident engine examination did not reveal any anomalies that would have precluded normal engine operation during the flight. Additionally, during a postaccident test, the engine operated normally without any hesitation, stumbling or interruption in power, and demonstrated the ability to produce rated horsepower.

The carburetor heat box, heat valve shaft, and a portion of the carburetor heat control cable were examined by a National Transportation Safety Board (NTSB) Materials Laboratory engineer. The heat valve vane inside the carburetor heat box had conformed to the deformation of the heat box body, and there was no evidence observed to determine the valve's position before impact. The heat valve shaft that held the carburetor heat box vane had fractured in a part of the shaft that was cross drilled for the vane attachment. A portion of the heat valve shaft remained attached in the deformed carburetor heat box. Examination of the heat valve shaft's fracture surface revealed features consistent with a brittle overstress fracture.

The separated portion of the heat valve shaft included a control arm with a portion of carburetor control cable still attached. The carburetor heat control cable was fractured about 3.5 inches from the heat valve shaft control arm, and the control cable exhibited a scalloped wear pattern and a tar-like substance adhering to the cable and the fracture surface. The observed fracture features were consistent with an overstress failure. The NTSB laboratory examination did not reveal any preexisting cracking on the carburetor heat control cable; however, the control cable exhibited evidence of prolonged polishing wear against the cable sheathing near the fracture, and the control cable had fractured in an area where the polishing wear had significantly reduced the cable's cross section.

Medical and Pathological Information

The autopsy reports for the pilot and passenger attributed their cause of death to multiple blunt-force injuries, and toxicology testing was negative for ethanol, carbon monoxide, and all tested drugs and medications.

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew		
Additional Participating Persons:	Geary Monckton; Federal Aviation Administration - ABQ FSDO; Albuquerque, NM Andrew Hall; Textron Aviation; Wichita, KS Chris Lang; Continental Motors; Mobile, AL Les Doud; Hartzell Propeller Inc.; Piqua, OH		
Original Publish Date:	January 20, 2022	Investigation Class:	3
Note:			
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98495		

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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](#).