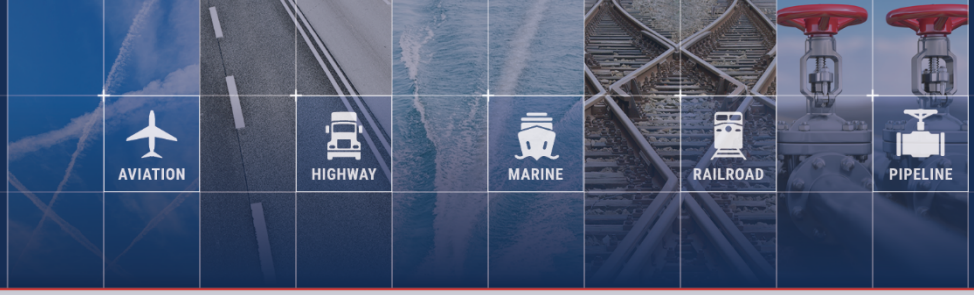

Aviation Investigation Final Report

Location:	Shafter, California	**Accident Number:**	WPR25LA092
Date & Time:	February 9, 2025, 11:15 Local	**Registration:**	N8535N
Aircraft:	Piper PA-28-235	**Aircraft Damage:**	Substantial
Defining Event:	Fuel starvation	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

During a local training flight, the flight instructor directed the student pilot to return to the airport to practice touch-and-go landings. After entering the traffic pattern and completing the landing checklist while turning from base to final approach, the engine sustained a total loss of power about 400 ft above ground level. The instructor assumed control of the airplane and performed the engine restart procedures; however, the attempts were unsuccessful. Realizing the airplane could not reach the runway, the instructor executed a forced landing in an open field. During the landing rollout, the nose gear dug into the soft terrain and the airplane nosed over, resulting in substantial damage to the fuselage, vertical stabilizer, and rudder.

A postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. A portable fuel tank was subsequently plumbed to each of the fuel tank ports on the selector valve and the engine operated normally in each of the fuel selector valve positions. The carburetor heat door also moved appropriately with cabin control actuation.

A review of weather data indicated atmospheric conditions conducive to the formation of serious carburetor icing at cruise-power settings. The flight instructor could not recall the position of the carburetor heat at the time of the event. Given the absence of mechanical anomalies identified during the postaccident examination, carburetor ice likely accumulated while the airplane was maneuvering in the traffic pattern before landing, resulting in the eventual 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 carburetor ice. Contributing was the student pilot and flight instructors' failure to utilize carburetor heat.

Findings

Environmental issues	Conducive to carburetor icing - Awareness of condition
Environmental issues	Conducive to carburetor icing - Effect on operation
Environmental issues	Conducive to carburetor icing - Effect on equipment
Personnel issues	Use of equip/system - Pilot

Factual Information

History of Flight

Approach	Fuel starvation (Defining event)

On February 9, 2025, about 1115 Pacific standard time, a Piper PA-28-235 airplane, N8535N, was substantially damaged when it was involved in an accident near Shafter, California. The student and flight instructor were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The student pilot reported that while on final approach to runway 30 at Shafter Airport-Minter Field (MIT), Shafter, California, the engine had a total loss of power about 400 ft above ground level. The flight instructor took control of the airplane, performed the power-loss-in-flight checklist, and attempted to restart the engine, but was unsuccessful. The flight instructor initiated a forced landing to a plowed garlic field about 1 mile south of the runway. During the landing roll, the airplane nosed over, which resulted in substantial damage to the left wing, vertical stabilizer, and rudder. Neither the student pilot or flight instructor reported using carburetor heat during the approach to landing.

Examination of the airframe and engine following the accident revealed no preimpact mechanical malfunctions or failures that would have prevented normal operation.

At 1045, the weather reported at Meadows Field Airport (BFL), about 9 miles southeast of the accident site, included a temperature of 52° F and a dew point of 41° F. The calculated relative humidity at this temperature and dewpoint was about 70 percent. Review of the icing probability chart within FAA Special Airworthiness Information Bulletin CE-09-35 revealed the atmospheric conditions at the time of the accident were "conducive to serious icing at cruise power."

FAA Advisory Circular (AC) 20-113, *Pilot Precautions and Procedures to be taken in Preventing Aircraft Reciprocating Engine Induction System and Fuel System Icing Problems*, Prevention Procedures 7 a. (12), states that prior to a prolonged descent at reduced power, carburetor heat should be applied briefly to warm the induction system. During the descent, engine power should be increased periodically to verify that normal power can be restored if needed. Pilots should also be prepared to discontinue the use of carburetor heat once power has been regained, such as when leveling off or executing a go-around after an aborted approach. Section 7 a. (13) further states that pilots should recognize that induction system icing, particularly in engines equipped with float-type carburetors, can occur even when ambient temperatures are as high as 100°F and relative humidity is as low as 50 percent. However, icing is most common when temperatures are below 70°F and relative humidity exceeds 80

percent. The probability of icing increases as temperatures approach 32°F and as humidity levels rise.

The recovery crew reported that very little fuel had drained from either fuel tank while the airplane was inverted at the accident site. The fuel selector valve was found positioned to the left wingtip tank. The primer plunger was found fully seated and locked. The carburetor heat control was in the On position. The flight instructor could not recall the position of the carburetor heat at the time of the event.

Examination of the cockpit engine controls, including the throttle, mixture, propeller, and carburetor heat controls, revealed full and unobstructed travel. Corresponding movement was observed at the carburetor throttle and mixture arms, as well as at the propeller governor. Operation of the fuel selector handle was normal and produced the expected movement of the selector valve, with positive detents noted at each position.

The fuel selector sump drain was actuated, and approximately one-quarter cup of clear blue liquid was collected. Testing with water-detection paste revealed no evidence of water contamination. The fuel strainer bowl was intact and was removed to facilitate examination of the filter screens. The screens were free of obstruction. The strainer screen and bowl were subsequently reinstalled in preparation for an engine test run. The electric boost pump operated normally when activated from the cockpit switch. The boost pump fuel filter was removed and found visually intact and free of damage.

A portable fuel tank was connected to each selector valve fuel port, and the airplane and engine were secured to a run stand. The engine successfully started using the external fuel source and demonstrated normal operation throughout the tested power range. The engine ran smoothly during the operational check in all fuel selector positions with no abnormal indications.

At the time of the examination, the airplane tachometer indicated 1,288.6 hours. Maintenance records showed that the airplane had accumulated 13 flight hours since its most recent inspection on August 2, 2024.

Student pilot Information

Certificate:	Student	**Age:**	49,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	June 18, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	74 hours (Total, all aircraft), 9.6 hours (Total, this make and model)		

Flight instructor Information

Certificate:	Commercial	**Age:**	23,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 3 None	**Last FAA Medical Exam:**	August 7, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 31, 2025
Flight Time:	555 hours (Total, all aircraft), 6 hours (Total, this make and model), 434 hours (Pilot In Command, all aircraft), 93 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8535N
Model/Series:	PA-28-235 D	**Aircraft Category:**	Airplane
Year of Manufacture:	1959	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-11334
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	August 2, 2024 Annual	**Certified Max Gross Wt.:**	2900 lbs
Time Since Last Inspection:	17.8 Hrs	**Engines:**	1
Airframe Total Time:	1275.6 Hrs as of last inspection	**Engine Manufacturer:**	
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	
Registered Owner:	On file	**Rated Power:**	
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:	KBFL,492 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	10:54 Local	**Direction from Accident Site:**	119°
Lowest Cloud Condition:	Clear / 4000 ft AGL	**Visibility**	8 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	11°C / 5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Shafter, CA	**Type of Flight Plan Filed:**	None
Destination:	Shafter, CA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	SHAFTER-MINTER FLD MIT	**Runway Surface Type:**	Asphalt
Airport Elevation:	424 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	30	**IFR Approach:**	None
Runway Length/Width:	4501 ft / 100 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	35.49581,-119.185

Preventing Similar Accidents

Preventing Carburetor Icing (SA-029)

The Problem

According to NTSB aircraft accident data, from 2000 to 2011, carburetor icing was a cause or factor in about 250 accidents. On average, carburetor icing causes or contributes to two fatal accidents per year. Accident evidence shows that some pilots do not recognize weather conditions favorable to carburetor icing and inaccurately believe that carburetor icing is only a cold- or wet-weather problem. Pilots may also have not used the carburetor heat according to the aircraft's approved procedures to prevent carburetor ice formation. In addition, some pilots may not recognize and promptly act upon the signs of carburetor icing.

What can you do?

- Check the temperature and dew point for your flight to determine whether the conditions are favorable for carburetor icing. Remember, serious carburetor icing can occur in ambient temperatures as high as 90° F or in relative humidity conditions as low as 35 percent at glide power.
- Refer to your approved aircraft flight manual or operating handbook to ensure that you are using carburetor heat according to the approved procedures and properly perform the following actions:
    - Check the functionality of the carburetor heat before your flight.
    - Use carburetor heat to prevent the formation of carburetor ice when operating in conditions and at power settings in which carburetor icing is probable. Remember, ground idling or taxiing time can allow carburetor ice to accumulate before takeoff.
    - Immediately apply carburetor heat at the first sign of carburetor icing, which typically includes a drop in rpm or manifold pressure (depending upon how your airplane is equipped). Engine roughness may follow.
- Consider installing a carburetor temperature gauge, if available.
- Remember that aircraft engines that run on automotive gas may be more susceptible to carburetor icing than engines that run on Avgas.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-029.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Johnson, Scott
Additional Participating Persons:	Jose Hernandez; Federal Aviation Administration; Fresno, CA John Jensen; Federal Aviation Administration; Fresno, CA
Original Publish Date:	October 21, 2026
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=199690

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.