



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Fairhope, Alabama	<b>Accident Number:</b>	CEN19LA265
<b>Date &amp; Time:</b>	July 30, 2019, 16:30 Local	<b>Registration:</b>	N6754J
<b>Aircraft:</b>	Piper PA28	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (partial)	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

The flight instructor and student pilot had performed several touch-and-go landings; after the final landing, they departed for another airport. Shortly after takeoff, the engine started to vibrate severely and then lost power. The instructor performed a forced landing in a field, which resulted in substantial damage to the airplane's left wing.

Postaccident engine examination revealed a failed No. 3 cylinder exhaust valve and extensive erosion on the No. 4 cylinder exhaust valve. The engine had accumulated 2,600 hours since the last overhaul, which was 600 hours beyond the manufacturer's recommended time before overhaul.

The flight instructor reported that the leaning technique used while the airplane was on the ground was to lean the mixture during taxi or engine idle. For the engine run-up, they would use a full rich mixture. He added that during flight maneuvers at or below 3,000 ft mean sea level, they would not lean the mixture. However, the exhaust valve erosion is consistent with the engine being operated with an excessively lean fuel mixture over an extended period.

## Probable Cause and Findings

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

Failure of the No. 3 exhaust valve and the subsequent loss of engine power due to engine operation with an excessively lean fuel mixture over a period of time.

## Findings

<b>Aircraft</b>	Recip engine power section - Damaged/degraded
<b>Personnel issues</b>	Incorrect action performance - Pilot

# Factual Information

## History of Flight

Enroute	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing

On July 30, 2019, about 1630 central daylight time, a Piper PA28-140 airplane, N6754J, conducted a forced landing after departing the H L Sonny Callahan Airport (CQF), Fairhope, Alabama. The flight instructor and student pilot were not injured, and the airplane sustained substantial damage. The airplane was registered to and operated by Lightning Aviation, LLC under the provisions of Title 14 *Code of Federal Regulations* Part 91 as an instructional flight.

The flight instructor reported that he was preparing the student pilot for his private pilot check ride and they had finished several touch-and-go landings. After the final landing, they planned to return to the Foley Municipal Airport (5R4). Shortly after take-off, the engine started a severe vibration, and then lost power. The instructor then preformed a forced landing in a cornfield, about two miles from the airport.

An examination of the airplane by a Federal Aviation Administration inspector, found damage to the airplane's left wing and engine mount. Further examination of the engine's No. 3 cylinder revealed a failed exhaust valve. The examination also found extensive erosion on the No. 4 cylinder exhaust valve. He also noted that the engine had 2,600 hours since the last overhaul, adding that the engine manufacturer's recommended overhaul is 2,000 hours, and the flight school consistently ran the engines past the recommended overhaul time.



Figure 1: Failed Exhaust valve FAA photo

The flight instructor reported that the leaning technique used while on the ground, was to lean during taxi or engine idle. For the engine runup, they would go to a full rich mixture. He added that during flight maneuvers at or below 3,000 ft msl, they would not lean the mixture.

## Flight instructor Information

<b>Certificate:</b>	Commercial; Flight engineer	<b>Age:</b>	42
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	October 1, 2017
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1004 hours (Total, all aircraft), 300 hours (Total, this make and model), 930 hours (Pilot In Command, all aircraft)		

## Student pilot Information

<b>Certificate:</b>		<b>Age:</b>	
<b>Airplane Rating(s):</b>		<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>		<b>Second Pilot Present:</b>	
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>		<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>			

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N6754J
<b>Model/Series:</b>	PA28 140	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1968	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	28-24477
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	
<b>Date/Type of Last Inspection:</b>	Unknown	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>		<b>Engine Model/Series:</b>	O-320 SERIES
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCQF	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	15:30 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	200°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.02 inches Hg	<b>Temperature/Dew Point:</b>	30°C / 22°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Fairhope, AL (CQF )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Foley, AL (5R4 )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	30.514722,-87.871948(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hatch, Craig
<b>Additional Participating Persons:</b>	Peter Rose; FAA FSDO; Birmingham, AL
<b>Original Publish Date:</b>	February 2, 2021
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=100043">https://data.ntsb.gov/Docket?ProjectID=100043</a>

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](#).