

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN25LA081

EXAMINATION SUMMARY

April 16, 2025

TABLE OF CONTENTS

A. ACCIDENT	3
B. EXAMINATION SUMMARY	3
C. SUMMARY	3
D. DETAILS OF THE EXAMINATION.....	5
1.0 AIRFRAME EXAMINATION.....	5
2.0 ENGINE EXAMINATION	6
3.0 ADDITIONAL INFORMATION	9
4.0 PILOT INFORMATION	10
5.0 AIRCRAFT INFORMATION	10
6.0 METEOROLOGICAL INFORMATION	10

A. ACCIDENT

Location: Bentonville, Arkansas
Date: January 16, 2025
Time: 1530 central standard time
Airplane: N6799P, Piper PA-24-250

B. EXAMINATION SUMMARY

IIC	Josh Lindberg NTSB Dallas, TX
Party Member	Tim Hughes FAA Little Rock, AR
Party Member	Jon Hirsch Piper Aircraft Vero Beach, FL
Party Member	Russel Gait Lycoming Engines Williamsport, PA

C. SUMMARY

On January 16, 2025, about 1530 central standard time, a Piper PA-24-250 airplane, N6799P, was substantially damaged when it was involved in an accident near Bentonville, Arkansas. The left seat pilot sustained serious injuries, and the right seat pilot sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 ferry flight.

According to the owner/co-pilot, who was in the right seat, he had just purchased the airplane, and the most recent annual inspection was overdue by about 5 months. He solicited the assistance of the left-seat pilot to help him with the prebuy inspection and to complete a 100-hr inspection before the ferry flight. He received a ferry permit from the Federal Aviation Administration (FAA) and intended to complete the 3-leg ferry flight to an airport where he could get an annual inspection completed. The co-pilot's father flew another airplane alongside the accident airplane and received visual flight rules (VFR) flight following services from air traffic control.

The pilot, who is also a certified airframe and powerplant mechanic, completed a 100-hr inspection and determined that the airplane was in a condition to safely complete the ferry flight. Before the first leg of the flight, the co-pilot topped off the fuel tanks with 29.26 gallons of 100 low lead aviation fuel, for a total of 60 gallons with 30 gallons in each fuel tank. After takeoff, they climbed to 4,500 ft mean sea level (msl) and circled above the airport to ensure the airplane was operating without issue and proceeded west at a cruise altitude of 4,500 ft msl. While enroute, the pilot noted that the Nos. 3 and 4 cylinder head temperatures were higher than expected so they did not lean the mixture. Since they did not lean the mixture and their fuel indicator showed a fuel consumption of about 20 gallons per hour (gph), they changed their first fuel stop to an airport closer than originally planned. After the 2-hour flight, they topped off the tanks by adding 20 gallons of fuel to each tank and confirmed that the fuel consumption was about 20 gph. During the second leg of the flight, their cruise altitude was about 6,500 ft msl, and the engine rpm was set about 200 rpm less than the first flight. After 50 to 60 minutes, the co-pilot switched to the right fuel tank, and they descended for landing. While in the traffic pattern, with the landing gear and flaps extended, the pilot adjusted the throttle, and the engine immediately lost power. He attempted to restart the engine several times, but the starter would not engage, and the propeller had stopped rotating. The co-pilot selected the left fuel tank, but the engine would not restart. The pilot executed a forced landing to a field and came to rest upright. During the landing, the landing gear collapsed, and the airplane sustained substantial damage to the fuselage and right wing.

The responding FAA inspector examined the fuel tanks, which remained intact, and determined that the left tank was empty, and the right tank contained about 27.5 gallons. The inspector removed a JPI Engine Data Monitor EDM-700 and a Shadin Fuel Flow Indicator for data extraction and analysis. The EDM-700 did not have recording capabilities, therefore, no data was extracted.

Preliminary analysis of the Shadin unit by NTSB RE-40 revealed that Fuel Used was listed as 219 gallons since it was last reset, according to the manual. The remaining fuel reads as 0.0 gallons, but the manual defines the remaining fuel parameter to be equal to Initial Starting Fuel minus Fuel Used. The maximum usable fuel setting was set to 56 gal. Since the Fuel Used was greater than the Maximum Usable Fuel, the Fuel Remaining would likely always be zero until reset.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Piper PA-24-250 s/n 24-1932

Hobbs: 862.7 hours / Tachometer: 5,685.3 hours / 3.8 hours since inspection

Last inspection: 100-hour on 4/16/25

POH: 60 gallons total. Only 56 gallons usable in critical flight attitudes but 60 gallons usable in all other attitudes (pending Piper verification).

FUEL LIMITATIONS

Fuel Capacity (Two Cells, 30 US gal ea.) 60 US gal - 56 Usable

** NOTE **

The unusable fuel in this aircraft has been determined to be 2 gallons in each inboard tank in critical flight attitudes. Minimum fuel grade is (blue) 91/96 octane (100 LL) aviation fuel.

Figure 1. International Commanche Society POH excerpt

The fuel strainer bowl was pulled and the cork gasket was intact. The bowl was dry and contained a white and blue substance at the bottom of the bowl. The top white layer was hard and calcified while the blue substance underneath was squishy and wet.

The two fuel boost pumps operated using ship battery power. The pump was opened and the filter screens were both clear of contaminants. The pumps contained fuel. Some fuel drained from the lines at the boost pumps.

Since the fuel boost pumps are the low point in the fuel system forward of the firewall, the remaining fuel collected in the area.

Low pressure air was applied to the fuel lines on each side of the fuselage where they had been separated from the wings during the recovery process. Air was able to pass freely from both the left and right sides, through the fuel selector valve, the fuel strainer bowl, and exited at a fractured fuel line adjacent to the electric boost pumps. During the test the selector handle was rotated from the Off position (as-found position) to both the right and left positions respectively. The selector rotated normally with each of the detents noted.

The left wing was found empty on scene with no residual fuel at all. During the exam the bladder was filled with about 15 gallons of water to check for leaks. No leaks were found. The fuel filler cap was intact and located in the fuel filler neck opening. During

the examination the fuel cell finger screen was removed and no blockage was observed.

The right wing maintained integrity and contained 27.5 gallons of fuel. The fuel was drained by the recovery company at the recovery facility. The fuel filler cap was intact and located in the fuel filler neck opening. During the examination the fuel cell finger screen was removed and no blockage was observed.

The primer plunger was found stowed and locked. The plunger was actuated and made a sound consistent with creating suction. The plunger was then removed and the 2 o-rings appeared in good condition.

2.0 Engine Examination

As first viewed, the airframe was resting on blocks with the wings separated. The engine remained installed on the airframe via its tubular mount system, with the engine cowlings covering the engine. The upper and lower engine cowlings were removed, and the propeller assembly was removed. The upper sparkplugs and rocker box covers were removed. The crankshaft was rotated a full 360 degrees multiple times by applying hand pressure to the crankshaft flange. Compression and suction were observed on all cylinders in the correct firing order, normal valve action was observed, and the impulse couplings could audibly be heard snapping during crankshaft rotation. Mechanical continuity was confirmed throughout.

Fuel System:

As first viewed, the carburetor was impact separated from its mounting point on the engine's induction plenum and was resting on the lower engine cowling. The mixture lever was halfway between full rich and idle cut-off. The mixture control cable was not attached to the mixture lever. The hardware on the mixture control arm remained installed but was not the correct hardware. The mixture cable moved as expected when the cockpit control was manipulated.

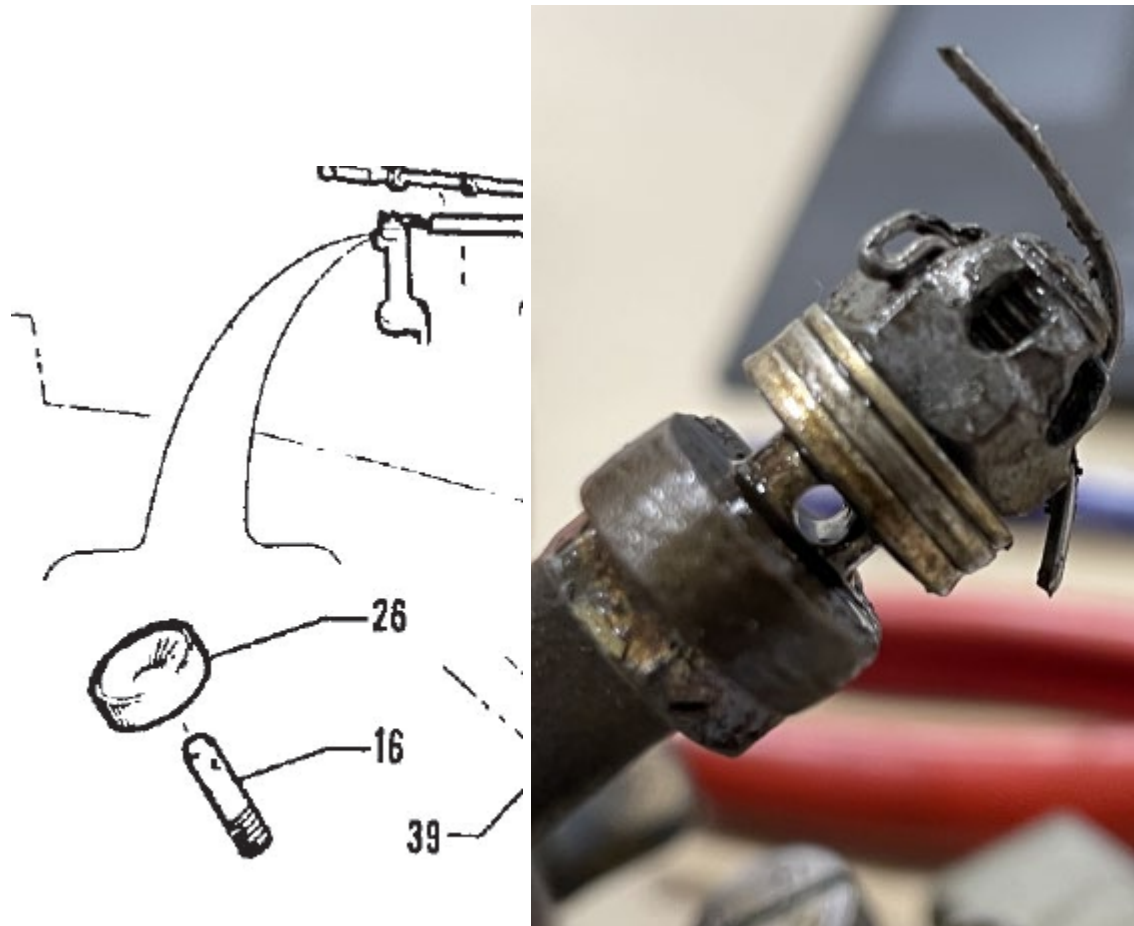


Figure 2. Mixture arm hardware to secure mixture cable.

The throttle lever was at the full throttle position, the throttle control cable was secured to the throttle lever and the serrated interface between the throttle lever and throttle arm was securely mated. The fuel lines were secure to the carburetor. The carburetor was removed from the aircraft, the inlet screen was removed, a minor amount of contamination was present in the inlet screen. The bowl was opened, no fuel was present in the bowl. The floats remained attached and appeared undamaged. The floats were removed and placed in a bowl of water; the floats floated. The needle valve was present and appeared undamaged, the accelerator pump was present and actuated when the throttle was actuated. The throttle plate moved appropriately when the throttle lever was actuated.

The diaphragm style engine driven fuel pump remained secured to the engine accessory case and was safety-wired. The inlet and outlet lines remained secured to the fuel pump. The fuel pump was removed from the engine, pressure was observed when the fuel pump lever was actuated. The fuel pump was disassembled, the presence of fuel was observed, the diaphragms were pliable and undamaged, and no contamination or blockage was observed. The fuel pump plunger was installed in the accessory housing and moved appropriately when finger force was applied to it.

Ignition System:

The left and right magnetos remained secure to the engine accessory housing. A timing check was performed, the right magneto was timed at approximately 23 degrees BTC, and the left magneto was timed at approximately 27 degrees BTC. The magnetos were removed, the drives were both secure, and the impulse coupling functioned correctly. The magnetos were function checked by installing the sparkplugs on each lead end and snapping the impulse coupling by hand, spark was observed arcing the gap on all sparkplugs from all ignition leads.

The sparkplugs were all secure in their respective positions and were removed. The ground electrodes showed signs of normal in-service wear. Varying levels of surface corrosion was observed on the sparkplugs. The faces of the electrodes were light gray to white in color, consistent with a lean running engine condition.

The ignition lead assemblies remained secured to both magnetos and to each sparkplug. The ignition leads had some minor chaffing damage, but did not appear to have been damaged from the impact sequence. The ignition leads were tested during the magneto test.

Oil System:

The oil filter remained secure to the oil filter adapter and was safety-wired. The date 1-15-25 and tach time 5,681.5 were written on the oil filter housing. The oil filter was removed and cut-open. Oil was present in the filter, no contamination or metal particles were observed in the pleats of the oil filter.

The oil suction screen remained secure in the oil sump. A black silicone like sealant was present on and covered the oil suction screen plug. The oil suction screen was removed, and some carbon and lead deposits were observed in the suction screen.

Accessories:

The starter remained secured to the engine crankcase with the power cable attached. The starter drive was in the engaged position.

The alternator remained attached to the engine, the alternator belt remained in position, the power wire remained attached.

The vacuum pump remained attached to the engine, it was not removed or examined.

Propeller:

The three bladed metal McCauley constant speed propeller remained attached to the crankshaft propeller flange. The blades were marked A, B, and C for narrative purposes. Blade A was oriented vertical and appeared relatively straight and

undamaged from the accident sequence. Blade B was oriented horizontally and to the left. The blade was bent aft slightly, dirt was dried on the blade along its trailing edge and there was trailing edge abrasion in the same location as the dirt. Blade C was bent aft near the blade root, was pressed up and into the lower engine cowling, and was covered in organic material.

The propeller governor remained secure on its mounting flange on the engine crankcase. The propeller control arm was secured to the lever, and the lever moved from stop to stop when the propeller control was actuated in the cockpit. The governor was not removed or examined further.

3.0 Additional Information

The Piper Aircraft investigator provided the following additional information regarding the fuel system:

The question was raised regarding whether or not the accident airplane should have had any "unusable fuel" remaining in the left fuel cell at the accident site. The question was due to an apparent conflict between information contained in Piper's Owner's Handbook (OH) which is applicable to the accident airplane and Piper OH's for later serial numbered PA-24-250's as well as the FAA Approved AFM/POH which was published by Douglas Killough and the International Comanche Society (ICS) which also claims to be applicable to the accident airplane.

More specifically, the Piper OH (p/n 753-529 which is applicable to the PA-24-180 and PA-24-250 for model years 1959 - 1960, which includes the accident airplane) states on page 5 of the specifications that the fuel capacity for the PA-24-250 is 60 gallons. There is no additional statement regarding "unusable fuel." Additionally, on page 12 of OH 753-529, in the Fuel System description, it also states that the fuel capacity is 60 gallons with no mention of "unusable fuel" capacity. Consequently, the reader could conclude that the full 60 gallons are usable. However, later Comanche Piper OH's (eq. p/n 753-597 which applies to 1962-1964 PA-24-250 Comanche's) state that the total fuel capacity is 60 gallons with 56 gallons usable.

Also, the ICS AFM/POH (which states it is applicable to the PA-24-250 Comanche, 1958 through 1960, and serial numbers 24-103 through 24-2298, except for 24-2003) states in the Limitations section on page 2-5 that the total capacity is 60 gallons with 56 gallons usable. It goes on to say that there are 2 gallons of unusable fuel "...in each inboard tank in critical flight attitudes".

The PA-24-250 (s/n 24-1 through 24-2843) has a different fuel cell than the later serial numbers. The fuel cell used in the earlier serial numbers (which includes the accident aircraft) have the port located ~3.36" forward of the aft end of the fuel cell. Then,

beginning at serial number 24-2844, the port was moved forward and is ~13.94" forward of the aft end of the fuel cell. It is reasonable to conclude that the different fuel cell port locations could explain the reason why earlier serial numbers do not specify an unusable fuel quantity while later serial numbers do. Since the accident aircraft serial number falls into the earlier range with no unusable fuel, it would also be consistent with the fact that no fuel was found in the left fuel cell at the accident site.

4.0 Pilot Information

Left seat pilot: Commercial pilot, Second class medical
2,453 total time ASEL, 545 hours make and model, 4 hours M/M in the last 90 days

Right seat pilot and owner: Private pilot, Basic med 9/12/2024
169.9 total time ASEL, 0 hours make and model

5.0 Aircraft Information

Airplane was purchased by the right seat pilot on 1/15/2025
The left seat pilot, who is also an A&P mechanic, completed a 100-hour inspection on the engine and airplane on 1/16/25 before the first leg of the accident flight. The 100-hour was completed at a tachometer time of 5,681.5 hours.

6.0 Meteorological Information

KVBT 162156Z AUTO 29005KT 10SM CLR 14/M02 A3017 RMK AO2 SLP224
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Submitted by:

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