

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA22LA104

EXAMINATION

June 30, 2022

A. ACCIDENT

Location: Edisto Island, South Carolina
Date: January 11, 2022
Time: 1247 Lcl
1747 UTC
Airplane: Piper PA-32-300 N475RT

B. EXAMINATION PARTICIPANTS

NTSB IIC	Aaron McCarter NTSB IIC Ashburn, VA
Lycoming	Troy Helgeson, ASI Lycoming Williamsport, PA

C. SUMMARY

On January 11, 2022, about 1247 eastern standard time (EST), a Piper, PA-32-300, N475RT, was substantially damaged when it was involved in an accident near Edisto Island, South Carolina. The private pilot was not injured. The airplane was operated as a Title 14 Code of Federal Regulations (CFR) Part 91 personal flight.

According to the pilot, who was also the owner of the airplane, the first leg of the flight was uneventful. After landing at Columbus County Municipal Airport (CPC), Whiteville, North Carolina to get fuel, he resumed the flight to Florida. After departure, about 15 minutes into the flight, while cruising at 4,500 ft mean sea level (msl), the engine started to sputter, then stopped, followed immediately by oil blowing out from the engine cowl onto the windshield, partially limiting his field of view. A forced landing was made resulting in substantial airframe damage. There was oil on the top of the engine cowl and oil spray on the windshield and fuselage. Upon further examination of the engine, a hole was discovered on the top of the engine near the No. 6 cylinder.

D. DETAILS OF THE EXAMINATION

1.1 Cockpit

All primary flight instrumentation was intact and appeared functional. All gauges were intact. There was a note in the cockpit near the tach/RPM that read $TT=2954 +Tach (237.8) Equals 3,191.8$ and $TSOH = 317.2 +Tach (237.8) Equals 555$

1.2 Survivability

The cockpit remained relatively intact and maintained its shape leaving occupiable/survivable space in the seating area. The pilot occupied the left pilot's seat and was wearing a three point harness.

1.3 Fuel/Fuel System

The fuel system which included the fuel servo and fuel pump remained attached to the engine and were free of any anomalous damage. The injectors were free of any foreign material and air flowed freely through each of the lines.

1.4 Magneto/Spark Plugs

The Slick **left** magneto was functional when manually operated with a drill and adapter. The rotation was smooth and free of any grinding or binding. There was no visible damage to the magneto and during rotation it produced healthy spark at each of the posts.

The Slick **right** magneto was functional when manually operated with a drill and adapter. The rotation was smooth and free of any grinding or binding. There was no visible damage to the magneto and during rotation it produced healthy spark at each of the posts.

The spark plugs appeared slightly dark in color indicating some minor carbon buildup but otherwise the electrodes appeared normal per the Champion check a plug chart. (Figure 1)



Figure 1 Spark plug condition

2.0 Engine Examination

Two irregular shaped holes were found at the rear crown of the engine located above the nos. 5 and 6 connecting rods, exposing the camshaft. Crankshaft continuity could not be performed because of internal damage. The nos. 5 and 6 connecting rods were found broken at the connecting rod caps with no heat signatures present. (Figure 2)



Figure 2 Overall view of top of engine showing hole over No. 5

One connecting rod cap bolt remained intact although it was bent showing exposed and damaged threads and a missing nut. (Figure 3)



Figure 3 Connecting rod with damaged threads and missing nut.

Both connecting rod caps were broken into pieces. Minor scoring was noted on the adjacent bearings and surfaces.

The engine oil pump showed minor scoring on the pump housing and there was ferrous material located in the pleats of the oil filter and a significant amount of metal and debris found in the oil sump.

The nos. 5 and 6 piston crowns and cylinder head domes exhibited features consistent with detonation; the piston crowns had the appearance of a "sandblast;" smooth and clean with the compression and oil rings compressed into the ring walls. (Figure 4)



Figure 4 Piston crowns with features consistent with detonation.

The internal retaining ring (circlip), washer, and roller were found separated from one of the counterweights. And all the internal retaining rings exhibited anomalous damage; their eyelets were broken off. (Figure 5)



Figure 5 Counterweight missing roller, washer, and circlip. On the right, a free roller and washer found in the crankcase.

The engine and associated parts recovered from the initial exam were delivered to the manufacturer for a detailed examination at the materials lab.

3.0 Propeller Examination

One propeller blade was twisted, and it contained some chordwise scraping and polishing. The opposing blade contained some scraping and was missing about 3 inches from the tip. (Figure 6)



Figure 6 Blade condition

The propeller governor remained attached to the engine and appeared to function normally. The governor screen was free of debris, and it was manually rotated and free of any binding or anomalous damage.

4.0 Pilot Information

Degree of Injury None Minor Serious	Fatal Unknown	Seat Occupied ☒ Left Right Center	Front Rear Single	Unknown	Restraint Type Available None Lap only 4-point 5-point Unknown	Used None Lap only 4-point 5-point Unknown	Instantaneous Restraints ☒ Not Installed Installed Not Deployed Deployed Unknown																																																																																										
Pilot Certificate(s) (Check all that apply) None ☒ Private Student Flight Instructor Recreational Sport Commercial Airline Transport Flight Engineer US Military Foreign																																																																																																	
Principal Occupation Pilot Other Unknown	Medical Certificate None Class 1 Class 2 ☒ Driver's License (Sport Pilot only) Unknown		Medical Certificate Validity Without limitations/waivers With limitations/waivers Special Issuance		Unknown N/A		Date of Last Medical mm/dd/yyyy																																																																																										
Medical Certificate Limitations Must wear corrective lenses																																																																																																	
Medical Certificate Special Issuance NA																																																																																																	
Date of Last Flight Review or Equivalent, Including FAR 121/135 Checks: 04/25/2020 mm/dd/yyyy				Flight Review Aircraft Make: Piper Model: PA-72-700																																																																																													
Airplane Rating(s) (Check all that apply) None ☒ Single-Engine Land Single-Engine Sea Multiengine Land Multiengine Sea		Other Aircraft Rating(s) (Check all that apply) ☒ None Airship Balloon Glider Gyroplane Helicopter Powered Lift		Instrument Rating(s) (Check all that apply) ☒ None Airplane Helicopter Powered Lift		Instructor Rating(s) (Check all that apply) ☒ None Airplane Single-Engine Airplane Multi-Engine Gyroplane Powered Lift Instrument Airplane Instrument Helicopter Glider Sport																																																																																											
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Figure 7 Pilot Information

5.0 Meteorological Information

Location.....: KJZI

Day of month.....: 11

Time.....: 18:15 UTC

Report is fully automated, with no human intervention or oversight

Wind.....: true direction = 050 degrees; speed = 4 knots

Visibility.....: 10 Statute Miles

no clouds and no restrictions on vertical visibility

Temperature.....: 10 degrees Celsius

Dewpoint.....: -09 degrees Celsius

QNH.....: 30.48 inHg

Submitted by:

Aaron McCarter

NTSB Aviation Accident Investigator