

To: Andrew Finne, NTSB

From: Rick Anderson [REDACTED]

Inspection report for CEN24LA378 on Piper PA32-300, serial number 32-7840130, N31407 and Lycoming IO-540-K1G5, serial number L-18003-48A. Tach time was 3504.00.

Inspection was conducted on November 21, 2024, at the Tuscola Area Airport (KCFS) with FAA PMI Bruce Arthurs and OJT Inspector Alfred Wright from the EMI FSDO.

Upon arrival at KCFS that airport manager unlocked the hangar, the aircraft was sitting with the nose landing gear and left main landing gear sheared off the aircraft. With assistance from a local hangar renter the aircraft was raised and put on wooden blocks to access the lower cowling and underside of wings and fuselage.

The lower cowling was removed, and inspection began.

The upper spark plugs leads were disconnected from the spark plugs and the plugs were removed for inspection. The lead on #1 upper plug and # 3 lower plug were found finger tight. All plugs were found to be new with normal coloring for limited operation.

Magneto to engine timing was checked and both mags are timed to 20 degrees BTDC as required by TCDS and engine dataplate.

Throttle, mixture and prop controls functioned normally and went to the stops.

Fuel selector valve operated normally and stopped in all detents.

The fuel injection nozzles were removed for inspection and flow check, nozzles were clean and clear. #4 injector nozzle was found finger tight in the cylinder. When the electric fuel pump was turned on no fuel flowed from the injectors and a fuel leak was observed at the fuel servo. (Video of leak was texted to Investigator Finne) The fuel pump was shut off and I found the B-Nut on the line from the fuel servo to the flow divider was loose at the fuel servo fitting. Hose part number LW-13175-4-340. It took 1 – 1.5 turns to tighten the connection. The fuel pump was turned back on, no leak was observed and fuel flowed from all 6 injector nozzles evenly. Fuel was collected in glass jars.

Inspection of the engine fuel system also found the part number 72377, 90-degree elbow in the engine driven fuel pump outlet could be rotated in the fuel pump with the hose attached, the jam nut was not tightened.

Fuel was drained from the strainer and a small amount of black colored contaminants was observed. Sample was saved. The strainer screen was removed, and the same black colored contaminants were present.

Fuel was observed in both main tanks and the left aux tank, blue in color and smelled like 100LL. The right aux tank ruptured in the accident.

Compression check was performed, the engine was cold (outside temperature was +42f). Engine operated less than 1 hour after IRAN and new rings were installed on all pistons. Cylinders are chromed.

- #1-cylinder 5/80, prop was pulled through several times and compression did not improve. Air leakage could not be heard and when pulling prop through to determine compression stroke with finger over upper plug hole, suction and compression could barely be felt.
- #2-cylinder 72/80
- #3-cylinder 72/80
- #4-cylinder 50/80 with air hear blowing out of exhaust system
- #5-cylinder 32/80 air leakage could not be heard.
- #6-cylinder 41/80 with air blowing out of exhaust system

Dipstick showed 10 quarts of clean oil in the engine. A sample of oil was drained from the oil sump drain valve and no contaminants observed. The oil filter was removed and cut open. The filter element had some contaminants in the pleats.

The muffler and tail pipes were crushed from the accident and could not be inspected internally.

The cylinders were inspected with a borescope, all showed crackling in chrome plating.

- #1-cylinder exhaust valve appears to be pitted on face and edge of valve. Seat shows signs of leakage.
- #2-cylinder and valve faces looked normal.
- #3-cylinder and valve faces looked normal.
- #4-cylinder exhaust valve shows signs of leakage at seat.
- #5-cylinder piston top was oil soaked; exhaust valve was reddish in color with oil stain on lower surface of valve face. Valve seat shows signs of leakage.
- #6-cylinder exhaust valve face was severely pitted and worn, valve seat showed evidence of leakage.





Engine Driven Fuel Pump Fitting with Loose Jam Nut



Fuel Nozzle Flow Check



Fuel Strainer Debris



Debris in Oil Filter Element



Crackling in Cylinder wall, found in all cylinders



#1 Cylinder Valves



#6 Cylinder Exhaust Valve



Tach Time