ERA23FA001

October 1, 2022

11:17 pm local CDT

Cessna 172

NTSB EXAM NOTES

NTSB IIC: McCarter, Aaron

Textron/Cessna: Gibson, Kurt

Lycoming: Harsanyi, David

History

On October 1, 2022, at 2317 central daylight time, a Cessna 172S, N262TA, was substantially damaged when it was involved in an accident near Hermantown, Minnesota. The commercial pilot and two passengers sustained fatal injuries and a married couple occupying a house sustained minor injuries The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The pilot (commercial instructor) and two passengers were all friends, and they were attending a wedding in Duluth. The flight departed 1015 am local time and landed about 11:30 am local. They departed South St Paul Municipal Airport-Richard E Fleming Field (SGS), South St Paul, Minnesota, about 1015 and flew about 130 nautical miles to Duluth International Airport (DLH), Duluth, Minnesota.

When the wedding/reception was over or when they choose to leave, they arrived back at the airplane and departed back to their home airport SGS, about a 1 hour and 15 minute flight.

Weather at the time was Mist, low ceiling, clouds and reduced visibility (LIFR) and nighttime conditions. Pilot had his instrument rating and was current.

Automatic Dependent Surveillance–Broadcast (ADS–B) data indicated the flight departed DLH runway 09 at 2312, then turned on a southerly track while climbing to about 1,750 ft mean sea level (msl) about 1 mile south of the departure runway. The airplane entered a tight teardrop turn to the left while climbing through 2,000 ft msl, then continued the turn 360° until it was on a track of about 270° at 2,800 ft msl, then began a descent that continued until powerline and house impact. ATC was communicating with the pilot throughout taxi, clearance and takeoff. The pilot was on an IFR flight plan. (Confirmed)

Personnel Information

Pilot: Tyler J. Fretland

Left front seat occupied; Comm/Flight Instructor/Instrument Airplane; ASEL) Per SPAS 0 hours since last medical (First Class) on April 2, 2019 but as of the accident he had about > 300 hours based on his hard cover logbook discovered at the accident site; the last entry was 3/1/2022 with a total of 296.3 total hours and a note "moved to electronic logbook" Unknown currently how much actual instrument time he has. Requesting his Foreflight logbook.

Airplane Info

According to FAA records, the airplane was manufactured in 2002, and was registered to SVETFUR AVIATION LLC. In addition, it was equipped with a Lycoming IO-360-L2A. It was a fuel injected 180 hp engine with a fixed pitch propeller.

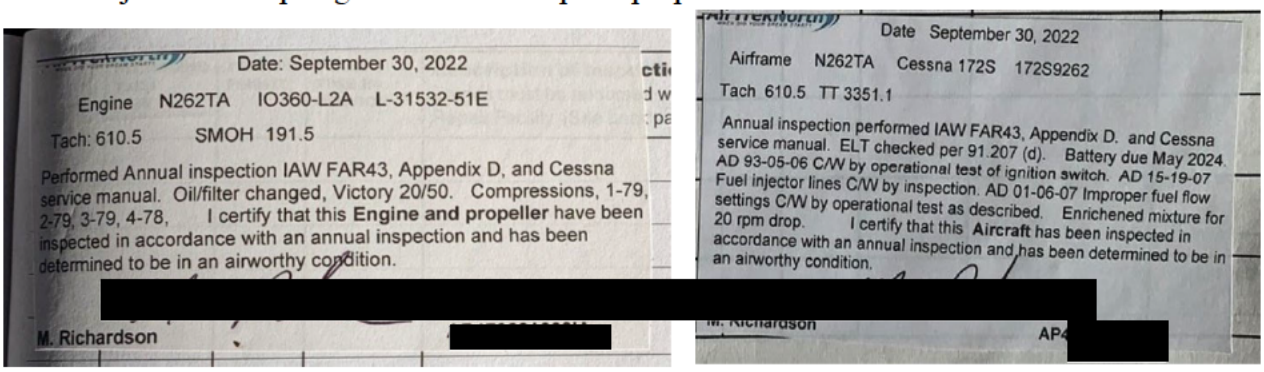


Figure 1 Airframe and Engine Records.

Maintenance records discovered at the operator in Duluth, MN. Brought up to accident site by FAA Inspectors. Last mx records. Note the day of last maintenance. It was the day before the accident. Check this out in a little more detail. Note to Lycoming and Textron.

Weather

Location.....: KDLH Day of month.....: 02 Time.....: 03:55 UTC Wind.....: true direction = 080 degrees; speed = 10 knots with gusts of 19 knots Visibility.....: 5 Statute Miles Weather.....: mist Cloud coverage.....: overcast (8 oktas) at 200 feet above aerodrome level Temperature.....: 09 degrees Celsius Dewpoint.....: 08 degrees Celsius QNH.....: 30.38 inHg Remarks site is automated and has a precipitation sensor Sea Level Pressure...: 1029.6 Mb Temperature.....: 9.4 degrees Celsius Dew Point.....: 8.3 degrees Celsius

Weather study requested from AS-30 (WX)

Wreckage and Impact

The aircraft's initial impact point was electrical power wires. There was a small electrical arc fire on the roof of the house that was extinguished by the time of arrival.

The airplane impacted the front facing roof of a two-story house at an elevation of about1,300 ft, and on a heading of about 208°. The airplane was in a 35° left bank as it impacted the structure based on the wing and left landing gear imprint on the house as it passed through. It passed through two upstairs bedrooms as the occupants of the house, a husband and wife slept, and then struck terrain before coming to rest inverted between a vehicle and a detached garage. There was no post-crash fire. The wreckage path was oriented on a magnetic heading of 205° and was about 200 ft in length. All major components of the airplane were located within the wreckage site. The left wing was found in the front of the house. The wife reported that she pulled red glass out of her hair. (Nav/Position Light) The occupants suffered minor injuries.

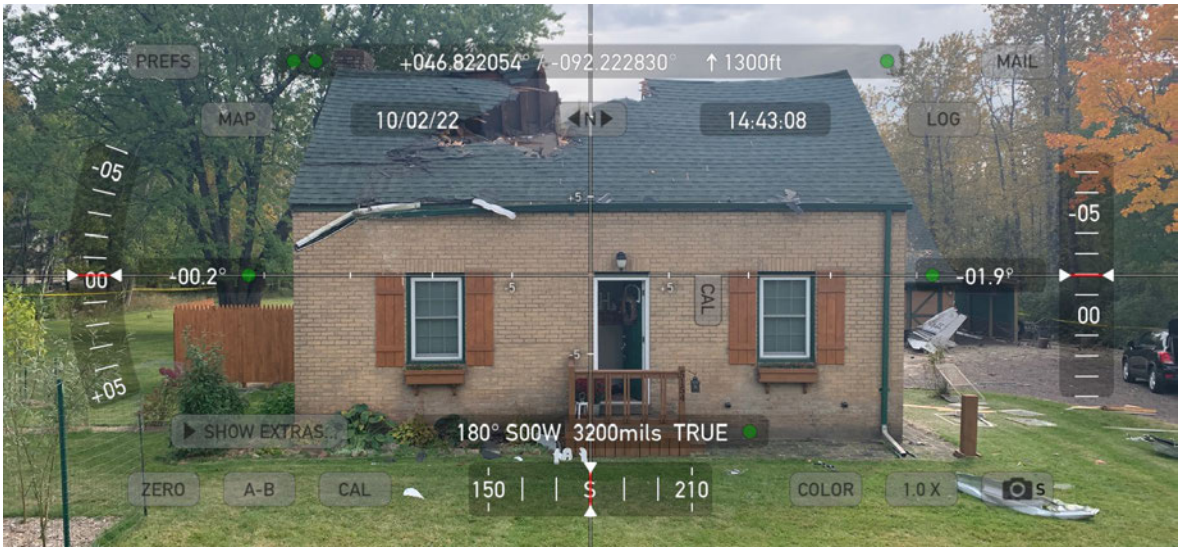


Figure 2 Front of house damage

Figure 3 Back yard of house damage with airplane model and approx. angle for reference.

The main wreckage including the fuselage and cockpit came to rest between a bard and a pickup truck. There was no occupiable living space in the cockpit. The entire wreckage was covered in a brown/tan paper like debris consisting of old blown insulation.
Safety brief to Cessna and Lycoming. There are hundreds of pieces of broken timber and wood with nails pointed up plus insulation debris (respirators)

Propeller

The two blade, fixed pitch propeller remained attached to the propeller flange; however, the propeller flange had broken free from the rest of the crankshaft. Both propeller blades were bent aft and had chordwise scratches, gouges, and some leading-edge gouging. Minor S-bend.

Engine

The engine separated during impact and was found lying next to the main wreckage in front of the truck. Engine impact damaged- No. 2 cyl. No holes in the case. Damaged rocker-box covers. Several 720 ° of rotation were conducted through the accessory drive and crankshaft control continuity was established. All rockers, valves and most pushrods appeared normal and were well lubricated. Each of the cylinder was tested for compression and suction. Several pushrods damaged. Champion Spark Plug Chart: All spark plugs normal wear.

Figure 4 Engine prior to internal examination

Figure 5 Spark Plugs

Figure 6 Engine with valve covers off.

Figure 7 Borescope of No. 4 Typical of all 4 pistons, valves, and cylinders.

Both wings had separated from the fuselage. The left landing gear strut had broken free from its attach point and was found with the main wreckage. The nose gear strut had impact separated from the aircraft and was located inside the impacted house.

Flight control continuity was established for all the flight controls through breaks that were consistent with tension overload.

The empennage separated from the fuselage and was found in front of the barn. It was in remarkably good condition. All the flight control surfaces remained attached and functioned normally when manually operated.

Figure 8 Tail/Empennage

The elevator cables were fracture separated with breaks consistent with tensile overload.

The rudder cables remained attached to the rudder bell crank and to the rudder pedal attach points. The elevator trim actuator had a measurement of approximately 1.28" which corresponds with a neutral trim setting.

The flap actuator had a measurement of about .375" which corresponds with the flaps being in the retracted position.

Fuel

The left and right fuel tanks were breached.
No fuel was recovered during examination and recovery. There was a faint smell of fuel consistent with aviation fuel.
Both fuel tank caps had broken free from their respective tanks and were not located.
examination.
Four of the fuel tank pickup screens had some debris consistent with the residential insulation that covered the entire scene.

The fuel selector was in the right position and air was blown through the selector and the valve was unrestricted.

ELT

The ELT was found and remained attached to the frame and antennae. It was in the auto position and was illuminated and sending out the "ping" Turned off unit.

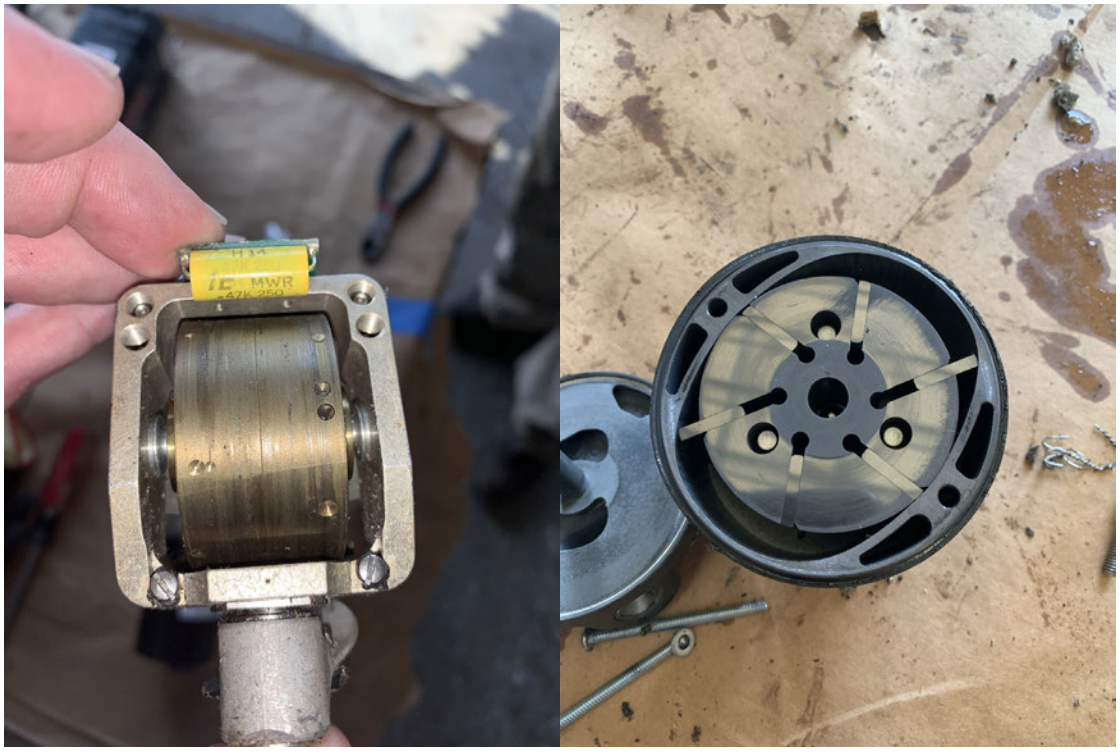
Cockpit documentation Instrument panel severely damaged

Airspeed indicator was pointed to 130 in the yellow.
Altimeter indicated 1,500 ft msl and 30.3 hg.
Vertical Speed indicated negative about 2,000 fpm.
RPM was fractured and the needle was pointing to 900 RPM and showed 0612.1 hours.
Master switch was indicating on.
Avionics master was indicating off.
Magnetos: the key was fractured, and it was indicating right mag.
Alternate air was off.
Throttle was at about 70% in, but the control wires were pulled out of the engine and breather.
Mixture full rich
Trim was indicating neutral.
EGT and Fuel flow off scale
Nav 1 and Nav 2 off scale broken needles. OBS was set to 050 degrees on #1 and 350 degrees on # 2
Heading indicator 016 degrees
COM and Radios off scale, broken and unknown.

Rotating beacon: Off
Landing Light: On
Taxi: On

Gyros and primary flight instruments

The attitude indicator, directional gyro, and turn coordinator: The gyros were capable of smooth rotation and rotational scoring was noted on the electrically powered turn coordinator gyro, there was no rotational scoring noted on the air powered attitude indicator gyro or directional gyro. The vacuum manifold was examined, and the diaphragms displayed normal operating signatures. All manifold and hose lines were free of breaks and leaks not impact related. Continuity was established and air flowed freely and operated the gyros.



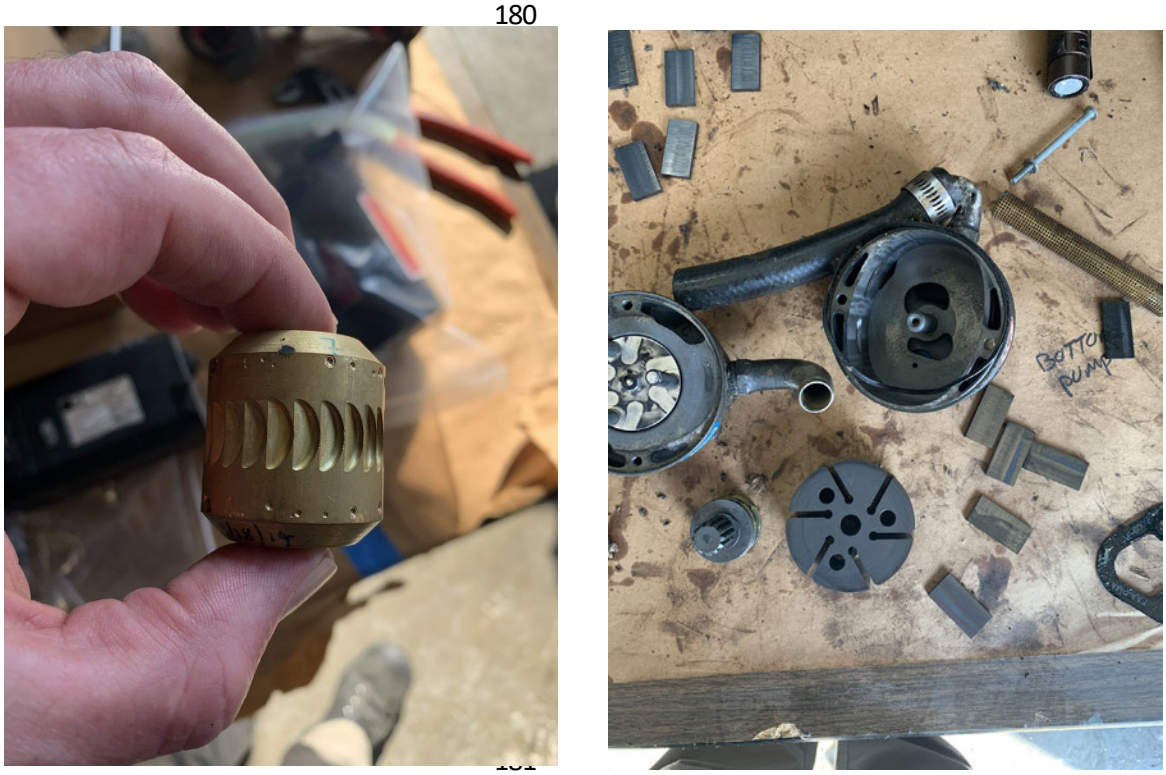


Figure 9 Vacuum pump and gyros. First photo at top prior to disassembly

Seat Belts

Each of the seats had a three (3) point safety belt system installed and each of them were cut by first responders for body extraction however, only the pilot's seatbelt was confirmed to being worn and buckled. The remaining seats, the buckles were found in the buckled position or had been damaged.

Muffler/Heat Exchanger/Shroud

Checked to ensure muffler was not pre impact compromised (CO) No pin holes or cracks or exposed seams observed. Muffler Assembly appears relatively new.

Figure 10 Muffler and heat shroud

Overall, View of Accident Site

Figure 11 View of accident site take from exit hole of second story of house.