

N619LD Accident

August 17, 2016, 0930 PDT, N619LD accident investigation

Aircraft: Zenith Zodiac 601XLB, S/N 66980 Amateur Built, 9/02/2015, certified May 20, 2016.

Rod Ziegler 's statement after examining the wreckage at the owner's hangar and garage.

Attending: Gaddie Orcullo, ASI (Accident IIC)

Rod Ziegler, ASI

Lonny Gunther, pilot/owner/aircraft builder

The aircraft log book shows the aircraft was given a condition inspection on 9/20/2015 by David Rowe A&P [REDACTED] and issued an Experimental AW certificate for the purpose of Amateur Built on May 20, 2016 by Charlie Cotton, DAR-F [REDACTED]

The aircraft and pilot accumulated 11.18 hours of flight in this newly constructed aircraft before the accident. The aircraft was in Phase 1 operations, test flight that was restricted to a 25 mile radius from Bowerman Airport (HQM), Hoquiam, WA.

The Mr. Gunther reported that he saw a decrease in the indicated voltage during the last few minutes of flight. He also said that all electrical systems quit working and then lost engine power at about 2500 AGL altitude. He also reported that he had ample fuel in the tanks.

At the crash site the team (son-in-law and friends) recovering the aircraft drained the tanks and kept the fuel for their own use. There was no fuel sample retained and the amount of fuel remaining in the tanks is unknown.

Mr. Gunther reported no aircraft controllability issues. Because of the poor power-off glide ratio for this model aircraft, approximately 4:1, the pilot had no airport landing options available within reach. To avoid congestion on the ground he opted for the bushes.

The FAA inspectors examined the wreckage without the benefit of the fuselage, engine, and other equipment in the same location. The fuselage was at Mr. Gunther's hangar at Bowerman Airport, Hoquiam, WA and the engine and accessories were at his son-in-law's garage in Montesano, WA.

The forward fuselage was substantially disassembled and wiring was cut and in disarray so it was not possible to inspect the wiring harness and connections, instrumentation, and aircraft systems as flown. Also not all instruments, interior components, damaged canopy pieces and other items were available because the owner had dismantled the aircraft and some items were disposed of or stored in other locations.

The owner said that he had previously replaced the voltmeter because of an indicating problem but was not sure of the exact malfunction. He did say that he found loose connectors on the first voltmeter.

When he installed the new voltmeter he used fingernail polish as "lock-tite" to prevent loosening of the meter connectors in the future.

The Odyssey Extreme Series PC-680 battery appeared to be new: CCA-170, reserve cap – 24 minutes, cyclic charging voltage 14.4 V. During our visit the battery was only showing a 10 volt charge.

Mr. Gunther showed us three wiring diagrams that he used as guidance for wiring this aircraft. His primary diagram included an alternator, and a starter solenoid. His actual aircraft electrical system used a mechanically activated Delco-Remy pull starter (no starter solenoid) and a 12V Delco-Remy DC generator. Therefore Mr. Gunther combined and adapted the example wiring diagrams to his airplane as equipped. He did not have an exact wiring diagram of the wiring he installed in the aircraft.

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The aircraft did not have a mechanical fuel pump. It depended on two Facet automotive electronic fuel pumps. Each pump had a dedicated switch on the instrument panel wired to the main bus. The fuel pumps were plumbed in series therefore all fuel to the engine must pass through both pumps. The Facet specification sheet states that pumps of this type are built with internal check valves, sealed electronics, corrosion resistant and pressure self-regulating. When 10 V battery voltage was applied to each pump they sounded to be functional although we had no fuel or fluid available to actually pump liquid. There was no hand pump, mechanical pump, or electrical power contingency on the aircraft to supply fuel pump energy in the event of an electrical failure. On the fuel selector valve panel there were placard provisions for left and right tank auxiliary pump switches. There were no auxiliary pumps installed.

The aircraft instrument panel was almost completely disassembled. Flight instruments and tachometer were not on site. The circuit breaker panel was missing labels for some of the CB's.

We removed the voltage regulator cover to examine the coils and points. All appeared normal.

The wire and connectors that remained in the fuselage were automotive type. No "popped" CB's were observed or reported and no overheated wiring or arcing was found.

The nose gear was bent to the right. The fuselage had compression wrinkles on the top skin between the empennage and the cabin. The right wing was removed and showed some outboard leading edge damage. The right elevator was significantly damaged. The skin below the horizontal stabilizer was wrinkled. The left aileron and wingtip sustained damage. The left main landing gear was partially folded under the fuselage. Mr. Gunther said that a significant amount of damage to the fuselage was caused by the recovery team.

The engine, Continental O-200-A, Serial number 72 JACH-A-48 was a used serviceable engine installed on N619LD with approximately 250 hours SMOH. When received the engine was equipped with an external oil filter and adapter on the oil cooler pad but Mr. Gunther removed the filter assembly and installed the cooler pad cover on the engine case. He said no compression check was done prior to flight. The engine contained used oil when received so he drained the oil and examined the oil and screen for metal or debris. No defects found.

The carburetor was a Marvel-Schebler MA3-SPA, S/N/ BE2422317, p/n 10-4894 and was separated from the engine by breakage of the intake manifold spider. The carburetor appeared to be in good condition. No fuel was in the bowl or squirted from the accelerator pump when we examined it.

Mr. Gunther claimed the left and right Slick 4201 magnetos were installed in an overhauled condition but there was no supporting paperwork.

The aluminum propeller was a McCauley MLM6656. The propeller appeared to sustain little or no damage from the accident.

Pilot's handbook and W&B data were available when viewing the wreckage.

Mr. Gunther, pilot certificate no. [REDACTED], provided his pilot logbook showing a current flight review, on 3/1/2016 and 719.96 total flight hours. Mr. Gunther stated that he is planning to quit flying. He feels fortunate that he survived this event. However he also owns another Amateur Built Zodiac 601 XLB, s/n 66989, N6698Z in Arizona.

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After reviewing with Mr. Gunther the sequence of events leading up to the accident, visually inspecting the aircraft and parts as available to us at the time of our visit, I believe the electrical system of the aircraft was not assembled using aviation standard practices and may have contained flaws in the wiring. Mr. Gunther did not exhibit a working knowledge of the aircraft's electrical system even though he takes credit for building it. An electrical harness flaw or failed connection(s) may have led to failure of the electrical system.

The pilot's description of a decreasing voltage indication during flight may have been indicative of charging system failure. He made no authoritative statement of what the ammeter indication was during the flight. Depletion of the battery by energized electrical equipment to a condition that would no longer provide enough electrical energy to operate the electronic fuel pumps may have resulted in fuel starvation and engine stoppage during the last flight.