

N36YR Narrative concerning the occurrence of an Off Airport Landing on June 2, 2022

This (June 2 2022) being a beautiful day for a pleasure flight and an opportunity to increase my time in the aircraft I prepared the aircraft for a one to two hour flight. Most flights of this nature have included time doing various maneuvers such as turns, stalls slow flight and landings at nearby airports. Preparation was accomplished in my hangar and included a complete pre-flight inspection of the airframe and engine. No discrepancies were noted and I approved the aircraft for the flight.

Included in the preparation were checks for fuel using a dipstick and sump drain, hydraulic oil in the retractable landing gear, engine oil and propeller speed reduction. These inspections along with those for control surfaces, tires, pitot and structure were found to be in excellent compliance. Also included were internal checks for the fire extinguisher, Owners Operating Handbook, Operating Checklist, condition of headphones and stowage of potential loose objects.

The aircraft was pulled from the hangar in a ready to fly state.

With Checklist in-hand the engine start was normal as was the avionics suite. This is a craft with two flat screen electronic displays. Instrumentation displayed all functions on board as normal. Engine rpm, temperatures/pressure, propeller oil pressure/ temperature quickly in the green. Voltage on both selectable battery circuits indicated in excess of 13 volts. Fuel pressure from both right and left pumps were as expected. Fuel flow was normal from both tanks. Fuel quantity at a total of 46 gallons (full capacity being 80 gallons) was being indicated and confirmed the dip stick check during pre-flight.

Aircraft was allowed to come to best operating conditions/temperature during taxi and pre-launch. Engine Run-up and Prop Check were normal with the engine running strong and the propeller responsive as on all previous flights.

Notes: The engine is a non-traditional one being normal to a Corvette. This stock GM-LS1 unit of 350 hp drives a Hartzell variable pitch propeller through a geared propeller speed reducer. This combination is a purchase unit.

The ignition system utilizes the stock components of the LS1 with few exceptions (addition of individual fuses for each spark coil). Starter, alternator, fuel distribution and relays are supplied as a package. This an automotive style system lacking a magneto.

Two individual battery circuits, a battery with each circuit, are separately controlled with solenoids and switches. Each circuit is independently fused. Either is capable of starting, running and being charged.

The fuel system: two tanks, one per wing, have a capacity of 40 gallons each. Using panel mounted switches either or both tanks may be selected. Fuel flows through a filter and valve to a collector manifold in the fuselage. Two independently operated electric fuel pumps (either/both option) push fuel through a final filter and up to the engine.

- 1:10 EDT Aircraft was flown off the departure end of Runway 28 into blue skies with light winds. Visibility in excess of 20 miles, temperatures normal for the season. Climbing westbound and turning left

to enter the runway pattern downwind leg nothing abnormal was noted. Climbing strongly to and slightly above pattern altitude on downwind I had just exited the pattern eastward and all was normal, engine running strongly.

Passing the point one would turn onto base the engine surged in a rapid manner 3 times, over a 10-15 second period prior to quitting.

I immediately initiated a turn toward Runway 28 and conducted a scan of the instruments which indicated "0" rpm but all other functions operating normal.

Fuel on board 46 gallons, Voltage 13+ volts. "Best Glide" airspeed was established and the turn toward the runway continued. Fuel options (dual pump and dual tanks) were checked and switched through the options without a change. Dual battery options were tested without change. Ignition switch was cycled but failed to turn over the engine. Operating/emergency checklist was consulted without finding additional suggestions.

Altitude and distance from the runway would probably have been sufficient to reach the runway in many other aircraft. However, the design of this amphibian craft (think Lake Renegade) includes features which came into play to defeat this opportunity. The structure is physically large in scope. It has a long wing span, a high vertical and broad horizontal stabilizer. An engine and cowl sticking above the fuselage and a feature not earlier recognized. This feature is a free-wheeling propeller when the engine is not running thus causing considerable air resistance which is not testable or trainable in the Phase I testing of a homebuilt. Considerable altitude was lost holding best glide airspeed.

Having aligned with the runway 28 and out of options I prepared the interior for possible impact and flew as far as my AOA instrument indicated possible, this being to ground level. Landing was inline but short of the threshold striking small trees. Damage to the aircraft was significant and will probably keep it from flying again.

Time estimate from initial problem to landing was approximately 2-3 minutes.

Aircraft was removed from the impact site using local resources and placed in owners hangar at Ray Airport.

Cause of engine failure is not known at this time. The usual two concerns of fuel starvation or electrical power lost do not fit. Engine surge frequently implies fuel problems. But with redundant fuel options this does not fit. Electrical issues are supported where the engine failed to turn over with the ignition switch but all other electrical functions were operational. Hopefully further analysis will indicate a probable cause.

In an e-mail from **Zachary P. Ortiz, FAA** Aviation Safety Inspector June 14, 2022 JMCD.

I have reviewed your statement and I have some follow up questions and requests for information. I will need the information so I can complete the FAA Form 8020-23, that the FAA will submit to the NTSB. I thank you in advance for your cooperation with this.

Regarding the Pilot in Command:

- What is the highest pilot rating you currently hold? Current ratings are Private SEL and SES
- What is your total pilot flight hours? Total Hours 3353.0
- What is the total flight hours in the aircraft type (TROJAN TA16)? 105.3 hours in Type
93.3 in TA16

Regarding the Aircraft Accident:

- If available, do you have pictures of the aircraft at the accident site? Photos attached
- If available, do you have pictures of the area where the crash occurred? No photos of the area currently available but the Site photos are generic of the area.
- Can you provide a picture of a map, with a drop pin or a shape (circle, square, or rectangle) showing the location of where the aircraft crashed short of runway 28? Or, can you provide a detailed statement that is specific to the location of where the aircraft crashed, short of runway 28?
A basic map is provided using the State of Michigan Airport Directory. The aircraft landed directly in-line with Runway 28, approximately 1000 feet east of the runway threshold.
- Can you please provide the specific hangar number at Ray Community Airport (57D), where the aircraft is located? Aircraft is currently stored in hangar 412
- Please provide current pictures of the aircraft in your hangar. Photos attached.

Regarding the Aircraft and Aircraft Records:

- Please send picture of logbook entry of completion of phase 1 flight testing.
Copy of Log page attached, shows for with/out sponson's
- Please send picture of logbook entry for last condition inspection.
Copy of Log page attached, Condition Inspection 9-1-2021
- Please provide current aircraft, engine, and prop total flight time.
Current time on Aircraft 83.6
Current Total Time on engine 83.6
Current time on propeller 83.6 SMOH
- Please provide as applicable information;
 - Aircraft make/model/series/serial number
Trojan TA16 / serial number 001 / Manufacturer James McDaniel

- Engine make/model/series/serial number
General Motors / LS1 / 5166IK765778
- Propeller make/model/series/serial number
Hartzell / HC-C2YK-1BF / S/N D76087,C97344
- Gearbox make/model/series/serial number
Geared Drives / bw350 / Serial Number not provided
- What is the source of the engine/gearbox/propeller combination?
Engine/Gearbox combination purchased from Geared Drives in Conroe TX
Propeller separately from H&S Propeller, Pontiac MI
- Was it a kit for the aircraft? This was not a kit, it was plans built
 - Or did you engineer and install engine/gearbox/propeller?
Original design specified a Lycoming O-540 engine. The Engine/Gearbox was engineered by Geared Drives for aircraft applications as an alternative to the Lycoming.
Propeller was specified by the aircraft designer of the plans.
- The statement provided says that it is a purchased unit. Just need some additional information.
 - Engine is still fuel injected? YES
 - Can the engine be turned by hand or is it seized? Engine appears to be seized
- From the statement, please provide clarification:
 - "This feature is a free-wheeling propeller when the engine is not running thus causing considerable air resistance..." Was the engine windmilling? No, the engine was not windmilling. The propeller was windmilling. There is a clutch between the engine and the gearbox which disengages the two components prior to starting. During start and subsequent rotation of the clutch the clutch locks the two together (propeller and engine) and remains locked until the engine stops.
 - "Ignition switch was cycled but failed to turn over the engine." Does this mean that the engine would not crank or that the windmilling engine would not start?
The engine would not crank over.
 - "Hopefully further analysis will indicate a probable cause." What additional analyses are going to be conducted? How soon will they be completed?
Analysis is probably overstating the case. As time permits the aircraft will be disassembled and the basic components will be reviewed for possible contribution to the problem. A formal engineering evaluation is not expected. There is no driving factor to complete the action except for recovering the hangar space for a more productive use, and the curiosity factor.

Other:

- Were the police called? If so, were they onsite, is there a police report, and which police department was involved?

No. There wasn't a need for civil services to be involved.