



U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

Cincinnati Flight Standards District Office
4358 Ferguson Drive
Cincinnati, OH 45245
Phone: [REDACTED]

September 21, 2021

Brian C. Rayner
Senior Air Safety Investigator
National Transportation Safety Board
AS-ERA
45065 Bles Park Dr.
Ashburn, Virginia 20147

Dear Mr. Rayner:

In regards to the accident of aircraft N101KL that occurred on 08/25/2021, and suspicion of fuel starvation (usable vs un-usable fuel) being the cause, the following field test was performed on 09/09/2021 to determine usable vs un-usable fuel in each wing tank.

The aircraft was placed on level ground in a hangar. Both wing tanks were emptied via the fuel drain sump. A sling was placed around the empennage of the aircraft and attached to the front end loader of a farm tractor. The fuel lines running from both wing fuel tanks were detached at the header tank, and the ends placed in a bucket. The aircraft was then put in different Pitch and roll situations, using the aircrafts EFIS as reference, which mimicked the data downloaded from the aircrafts EFIS during its final flight. Water was then measured and added to both wing tanks until it flowed into the bucket to determine the amount of un-usable fuel with the following results:

With the aircraft at 0° Pitch and Roll, 1.75 gallons of water was added to each tank before flow was noted into the bucket from both tanks. With the aircraft placed at -12.5° Pitch (nose down) and remaining at 0° Roll, 6 gallons of water was added to each tank before flow into the bucket was noted. With the aircraft remaining at -12.5° Pitch and a left roll of 8° applied, the right tank took 3.5 gallons of water and the left tank 6.5 gallons of water before flow into the bucket was noted.

Each fuel tank holds 13 gallons of fuel (26 total), and the header tank fuel capacity of 40 ounces (.31 Gallons). There is no secondary pickup in the fuel tanks due to the folding wing design of the aircraft.

Due to the adverse ratio of usable vs un-usable fuel, it is my view that this causes a very unsafe condition that can occur without warning leading to inflight engine shutdown. Please advise on

possible recourses that can be initiated to stem future accidents and notify aircraft operators of this condition. I may be reached by phone at [REDACTED].

Sincerely,

[REDACTED]

Rick Jara
Principal Maintenance Inspector

Just Highlander Fuel Capacities

	Pitch	Bank	Unusable Fuel	
			Left Tank	Right Tank
Level Flight	0	0	1.75 Gal.	1.75 Gal.
Descent	-12.5	0	6 Gal.	6 Gal.
Left banking decent	-12.5	Left 8-Deg.	6.5 Gal	3.5 Gal

Additional Notes:

- Header tank .31 Gal. total usable fuel
- Total Fuel tank capacity 26 Gal.
- No front fuel tank pickup due to folding wing design
- Right fuel tank empties at faster rate than the left due to distance of piping from the fuel tank to the header tank, Std left hand patterns, addition weight of pilot on left side of aircraft