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Date: 4/16/2025

Subject: ERA25LA003, Fuel Burn Calculation

A fuel burn calculation for the accident airplane flights performed by the accident pilot on the date of the accident consisted of 4 legs with the accident occurring on the 4th leg. These calculations were performed using the Piper Cherokee Archer II Pilot's Operating Handbook (POH) for take-off, climb, and descent fuel burn. The accident pilot reported that he did not lean the mixture at any point during the flights due to the low cruise altitude and as such the fuel consumption tables in the POH were not valid. The IIC reached out to Lycoming engines and requested fuel consumption data for the Lycoming O-360-A4A which was installed on the accident aircraft, and they reported the following: "engineering specification sheet for the O-360-A4A it lists the follow: Rated power ~15.6 gph: 75% rated power 9.7 gph: 65% rated power 8.3 gph: 60% rated power 7.7 gph." Based on true airspeed data retrieved from the Garmin G1000 avionics onboard it is likely that during cruise the engine was being operated at about 75% rated power and that is the consumption rate used for these calculations. The pilot reported that he switched fuel tanks when prompted by the avionics which were set to prompt the pilot every 30 minutes. These fuel calculations do not take into account the fuel burn with the engine running on the ground between landing and takeoff but do take this time into account for the annunciation to switch fuel tanks. The calculations also assume that the fuel selector was likely not switched during critical phases of flight.

Fuel Tank #1	Fuel Tank #2
Take-off and climb #1: 2 gallons	
25 minutes of cruise flight: 4.3 gallons	

	15 minutes of cruise flight: 2.5 gallons
	Descent and landing #1: 1.5 gallons
	Take-off and climb #2: 2 gallons
	5 minutes of cruise flight: 0.9 gallons
30 minutes of cruise flight: 5 gallons	
Descent and landing #2: 1.5 gallons	
	Take-off and climb #3: 2 gallons
	20 minutes cruise flight: 3.4 gallons
25 minutes of cruise flight: 4.3 gallons	
Descent and landing #3: 1.5 gallons	
Takeoff and climb #4: 2 gallons	
	22 minutes of cruise flight: 3.6 gallons
11 minutes of cruise flight: 1.8 gallons	
Total:	Total:
22.4 gallons	15.6 gallons

Based on the POH each wing tank for the accident airplane contained 24 gallons of usable fuel if the airplane was completely full. A review of fuel records found the airplane was fueled with 24.9 gallons of 100 LL aviation fuel the evening before the accident flight and did not fly again until the accident flight. The pilot reported the airplane departed with 50 gallons of fuel onboard.