



MEMORANDUM FOR RECORD

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Subject: ERA15FA330
Who: Brad Miller – Cirrus Aircraft representative

Below are the performance calculations performed by a Cirrus Aircraft engineer.

2,339 lbs	- Basic Empty Weight of N1116C
+160 lbs	- Pilot Weight
+275 lbs	- Starting Fuel Weight (47 gallons)
<u>-117 lbs</u>	<u>- Estimate Fuel Consumed (20 gallons)</u>
2657 lbs	- Estimated Accident Weight

With the flaps in the 100% position, the weight corrected stall speed would be;

$$V_{SO}|_{2,657\text{lbs}} = 59\text{KCAS} \sqrt{\frac{2,657\text{lbs}}{3,400\text{lbs}}} = 52.2\text{ KCAS}$$

This is below the lowest observed airspeed (66.2 KCAS) at the time of the accident, however, one must also consider load factor (normal acceleration). It influences stall speed similar to weight. For 52.2 KCAS, the load factor required to bring the stall speed up to 66.2 KCAS would be 1.61g;

$$52.2\text{ KCAS} \sqrt{N_z} = 66.2\text{ KCAS} \Rightarrow N_z = 1.61g$$

According to the downloaded data, normal acceleration/load factor at the time near the pitch down was ~1-1.1g.

Stall speed at other flap settings:

50% flaps;

$$V_{S1_50\%} \Big|_{2,657lbs} = 62 KCAS \sqrt{\frac{2,657lbs}{3,400lbs}} = 54.8 KCAS$$
$$54.8 KCAS \sqrt{N_{Z_50\%}} = 66.2 KCAS \Rightarrow \underline{\underline{N_{Z_50\%} = 1.46g}}$$

0% flaps;

$$V_{S1_0\%} \Big|_{2,657lbs} = 67 KCAS \sqrt{\frac{2,657lbs}{3,400lbs}} = 59.2 KCAS$$
$$59.2 KCAS \sqrt{N_{Z_0\%}} = 66.2 KCAS \Rightarrow \underline{\underline{N_{Z_0\%} = 1.25g}}$$