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Eastern Region Aviation

Date: 09/23/2025

Subject: ERA24FA371

Contact: Kris Wetherell - Air Safety Investigator for Piper Aircraft

Below is the fuel burn calculations as well as the weight and balance estimations performed by the Air Safety Investigator for Piper Aircraft for the accident involving N3757T:

Fuel burn from Windham Airport in CT (KIJJ) to Harbor Basin Airport (B06) in VT.

Distance 156 NM – using straight line navigation

Fuel burn estimated at 5,000 feet and 75% power equals 9.42 gallons per hour burned

Speed at 75% power at 5000 feet equals 135.5 knots true airspeed

156 NM at 135.5 knots = 1.15 hours flight time

1.15 hours at 9.42 gal./hour equals 10.8 gallons of fuel burned enroute.

With full tanks the airplane would have had 50 gallons minus 10.8 gallons equals 39.2 gallons or 235.2 lbs. remaining on arrival at Harbor Basin in VT.

With fuel filled only to tabs the airplane would have had 36 gallons minus 10.8 gallons equals 25.2 gallons or 151.2 lbs. remaining on arrival at Harbor Basin in VT.

Weight and Balance

The fuel loading upon departure from KIJJ could not be determined, therefore two weight and balance computations are performed below to approximate the airplane

loading at takeoff from B06. One chart using tabs fuel (36 gallons) and one using full fuel (50 gallons) at the beginning of the flight from KIJD to B06.

Addressing FORWARD CG **FUEL AT TABS**:

In the case of tabs fuel loading the airplane is at 2,401.6 pounds in our computation with a CG of 89.69 inches. The forward limit is 91.0 inches at 2500 lbs. and 81 inches at 1925 lbs., with straight line adjustments in between. There is 575 pounds difference on the weight and balance information in the AFM between max weight (2500 lbs.) forward CG and forward CG at 1925 lbs. 575 lbs. divided by 10 inches = 57.5 lbs, so for every 57.5 lbs. you go down in weight you can be an inch more forward in CG. In this case the airplane is 98.4 lbs. lighter than maximum (2500) so we look at the math:

98.4 lbs. divided by 57.5 lbs./inch = 1.69 inches of forward CG shift allowed.

In this case the airplane can have a forward CG limit of 91.0 (max weight forward CG) minus 1.69 inches = 89.31 CG allowed.

So if the airplane were loaded to tabs the CG of 89.69 would be **WITHIN** forward limits. The aft limits are 95.9 inches regardless of weight.

Addressing **FULL TANK** weight and balance.

The full fuel tank computation puts the airplane weight at 2,485.6 lbs. with a forward CG of 89.87 inches. The airplane is 14.4 lbs. lower than maximum weight in this case. 14.4 lbs. divided by 57.5 lbs./inch equals 0.250 or one quarter inch lower allowance for the forward CG.

90.11 inch forward CG limit at maximum weight minus 0.25 inches = 90.86 inches forward CG allowed, so our airplane starting with full fuel would be **OUT** of the forward CG limit.

GENERAL WEIGHT AND BALANCE CHART N3757T
For Reference see the aircraft POH and FAA -H-8083-1A

ITEM	WT. (LBS.)	ARM (IN.)	MOMENT (IN. LBS.)
BASIC AIRPLANE	1494.4	83.42	124662.84
PILOT'S SEAT	141.0	85.50	12055.50
COPILOT'S SEAT	237.0	85.50	20263.50
SEAT NO. 3	200.0	118.10	23620.00
SEAT NO. 4	133.0	118.10	15707.30
			0.00
			0.00
			0.00
Oil (2 gal.)	15.0	29.50	442.50
FUEL GAL. 39.2 (MAIN)	235.2	95.00	22344.00
			0.00
BAGGAGE AFT	30.0	142.80	4284.00
TOTAL WEIGHT <u>2485.6</u> CG <u>89.87</u> TOTAL MOMENT <u>223379.64</u>			

***Moment due to retracting gear is 819 not applied here**

Take off at B06 after burning off 10.8 gallons enroute from CT starting with full tan

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SEAT NO. 4	133.0	118.10	15707.30
			0.00
			0.00
			0.00
Oil (2 gal.)	15.0	29.50	442.50
FUEL 25.2 GAL. (MAIN)	151.2	95.00	14364.00
			0.00
BAGGAGE AFT	30.0	142.80	4284.00
TOTAL WEIGHT <u>2401.6</u> CG <u>89.69</u> TOTAL MOMENT <u>215399.64</u>			

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Take off from B06 after burning off 10.8 gallons enroute from CT starting with tabs fuel