

Takeoff Performance Calculations

Estimated Distance required to clear 50' obstacle on accident day:

938 ft for a level, dry grass runway

The runway had a 3% uphill gradient, rising about 30ft over a length of about 1000 ft.

Airplane Weight

Empty weight w/oil: 1094.6 lbs (weight and balance records found in airplane)

Pilot: 160 lbs (Pilot's License)

Fuel $\frac{3}{4}$ full

(0.75 x 35 gal capacity x 6 lb/gal): 157.5 lbs (Pilot reported fuel load on NTSB form 6120)

Total Takeoff Weight: **1412.1 lbs**

Max Gross Weight 1650 lbs

Takeoff weight is 237.9 lbs (14.4 %) below Max Gross

Weather:

Nearest Reporting Station (CVG), Elevation 883 ft, located 16 nm northeast of accident site:

Temperature 75F Dewpoint 68F, Altimeter 29.86

Wind 290 at 12 knots

Two unofficial weather stations located 4 nm east of accident site:

Location 1

Temperature 79F at elevation 817 ft

Wind 0

Location 2

Temperature 77.6F at elevation 417 ft

Wind WSW 1 mph

Accident Site Elevation 800 ft

Density Altitude using CVG temperature/Dewpoint/Altimeter and 800 ft field Elevation:

2389 ft

Wind Components:

Runway heading 006 deg

Using CVG wind 290 deg at 12 knots

headwind component = $12 \times \cos(360-290+6) = 2.9$ knots

Crosswind component = $12 \times \sin(360-290+6) =$ (left) 11.6 knots

Interpolation of the Take-off/Climb Performance chart in the POH:

Using Temperature 75F

Density Altitude 2389 ft

Distance to clear a 50 ft obstacle (trees of unmeasured height at end of runway):

1202 ft – Max gross weight of 1650 lbs., level dry pavement

Calculated Takeoff weight: 1412 lbs, (14.2% below Max gross)

Estimate reduction in takeoff distance of 30% due to lower than max gross weight (per FAA Pilot's Handbook of Aeronautical Knowledge – page 11-15)

$1202 - 361 = \mathbf{841 \text{ ft}}$

Estimate increase of 15% for level, dry, grass runway: (a typical value published for light GA airplanes)

$841 + 126 = \mathbf{967 \text{ ft}}$

Estimate decrease of 3% for 2.9 knot headwind component:

$967 - 29 = \mathbf{\underline{938 \text{ ft}}}$

Runway has about a 3% uphill gradient (elevations from Google Earth 35 ft rise over 1100 ft)

This would increase the distance required.

TAKE-OFF/CLIMB PERFORMANCE

MODEL		7ECA			7GCBC			7GCAA, 7KCAB	
Press Alt Ft.	Temp (°F)	T.O. Dist Ft.	50 Ft. Obst Ft.	R/C	T.O. Dist Ft.	50 Ft. Obst Ft.	R/C	T.O. Dist Ft.	50 Ft. Obst Ft.
S.L.	0	340	716	800	231	457	1240	289	535
	20	372	768	775	254	491	1210	317	574
	40	415	832	750	279	530	1170	350	618
	60	455	895	725	305	567	1145	382	663
	80	496	961	700	340	616	1110	417	713
	100	544	1034	675	363	649	1090	453	763
2000	0	407	860	685	272	536	1100	343	622
	20	444	929	660	294	573	1070	376	671
	40	492	1004	635	331	629	1030	414	727
	60	543	1086	610	374	684	1010	452	784
	80	597	1174	585	397	733	980	497	846
	100	655	1269	560	433	777	950	538	904
4000	0	482	1043	575	324	635	980	401	738
	20	538	1147	545	360	695	930	448	806
	40	589	1239	520	393	746	900	479	857
	60	640	1329	495	458	834	870	527	925
	80	690	1432	470	474	870	840	573	991
	100	788	1580	450	522	935	820	643	1086
6000	0	576	1301	465	385	763	840	479	886
	20	640	1432	435	421	827	800	529	962
	40	707	1562	410	472	905	770	582	1040
	60	789	1716	385	522	981	740	647	1133
	80	858	1858	365	568	1048	720	706	1226
	100	968	2058	340	626	1137	690	760	1304
8000	0			350			700		
	20			325			670		
	40			300			640		
	60			275			610		
	80			245			580		
	100			225			550		

PALT 2000 ft
Temp 75F
--> 1152 ft

PALT 4000 FT
Temp 75F
--> 1406 FT

Calculated
Density ALT:
2389 FT
Temp 75F
--> Distance of
1202 ft

- 1) All performance at maximum gross weight 1650 lbs.
- 2) Take-off performance on dry pavement.
- 3) 7GCBC with 14° flaps.

can be assumed for all flights. For ease of calculations, the new "Empty Weight and Moment" determined and entered in the Sample Loading "Airplane".

h, Figure 5-2, determine the weight and the items and enter these figures on the

Maximum Usable @ 6 Lbs./Gal.
Maximum (Normal Category Only)

t and Moment with Oil" and all the the "Gross Take-Off Weight and Moment".

res 5-3, 5-4, 5-5 for the model the gross take-off weight and

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in the approved flight reloaded. Under no craft be flown with particularly if ted.

SAMPLE LOADING PROBLEM 8698					
ITEM	ARM (in)	SAMPLE AIRPLANE		YOUR AIRPLANE	
		WEIGHT (lbs)	MOMENT (in-lbs)	WEIGHT (lbs)	MOMENT (in-lbs)
1) Licensed Empty Weight	12.2	1153	14067	1085.85	11985.6
Oil-8 qts @ 7.5 lbs/gals *7ECA--6 qts	-36.0	+15	-540	+15 (+11*)	-315 (-396*)
2) Licensed Empty Weight & Moment With Oil		1168	13527	1094.60	11670.6
3) Pilot	11.5	190	2185	180	2125
Rear Passenger	42.0	190	7980		
Wing Fuel - 35 Gals Max @ 6 lbs/gal	24.5	102	2499	150	3750
Baggage-100 lbs Max (Normal Category Only)	69.0	-0-	-0-	30	2100
4) Gross Take-Off Weight & Moment		1650	26191		

- NOTE: 1) * 7ECA only - 6 qts oil.
 2) To determine Take-Off Center of Gravity (inches aft of datum), divide the Gross Take-Off Moment by the Gross Take-Off Weight. Center of Gravity Limits are listed in Section I.
 3) The above sample problem is loaded for aerobatic flight conditions and assumes a 170 pound pilot and passenger with parachutes.

06/04/2018 12:39

FIGURE 5-1 SAMPLE LOADING PROBLEM

UNITED STATES OF AMERICA

XI

DEPARTMENT OF TRANSPORTATION • FEDERAL AVIATION ADMINISTRATION



IV NAME

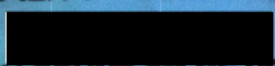
ROBERT DOW ASKINS

V ADDRESS



VI NATIONALITY USA

IVa D.O.B.

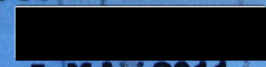


SEX HEIGHT WEIGHT HAIR EYES
M 67 160 BROWN HAZEL

IX HAS BEEN FOUND TO BE PROPERLY QUALIFIED TO EXERCISE THE PRIVILEGES OF

II AIRLINE TRANSPORT PILOT

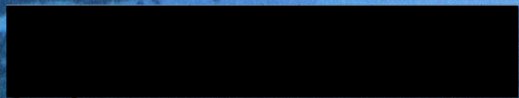
III CERTIFICATE NUMBER



X DATE OF ISSUE

5 MAY 2011

XIV



VIII

ADMINISTRATOR



06/04/2018 13:27



N8698

Elevation 835 ft

Elevation 800 ft

Google Earth

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1000 ft

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