

Angle of bank ϕ	Load factor n
0°	1.0
10°	1.015
30°	1.154
45°	1.414
60°	2.000
70°	2.923
80°	5.747
85°	11.473
90°	∞

Load factor chart

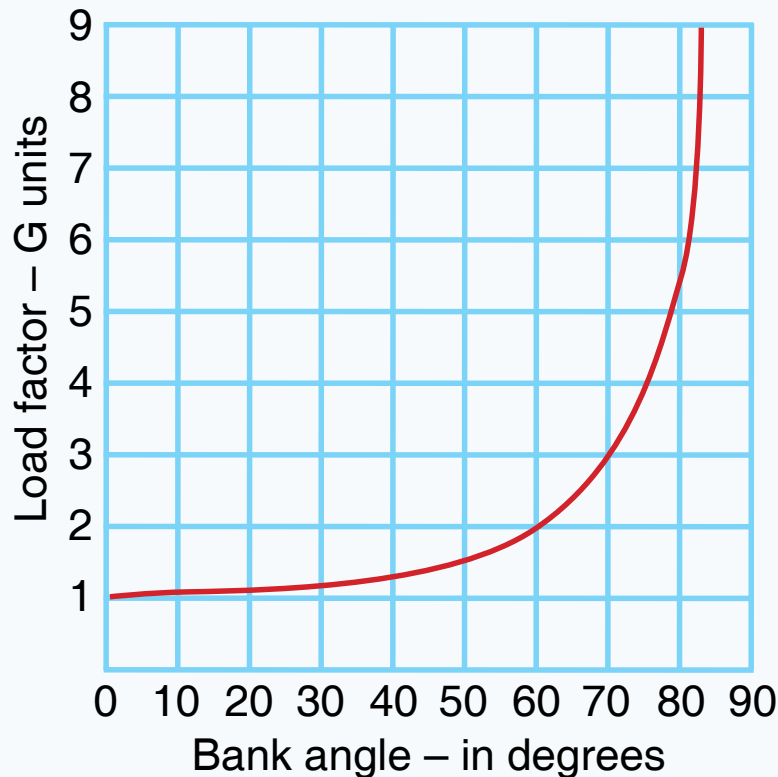
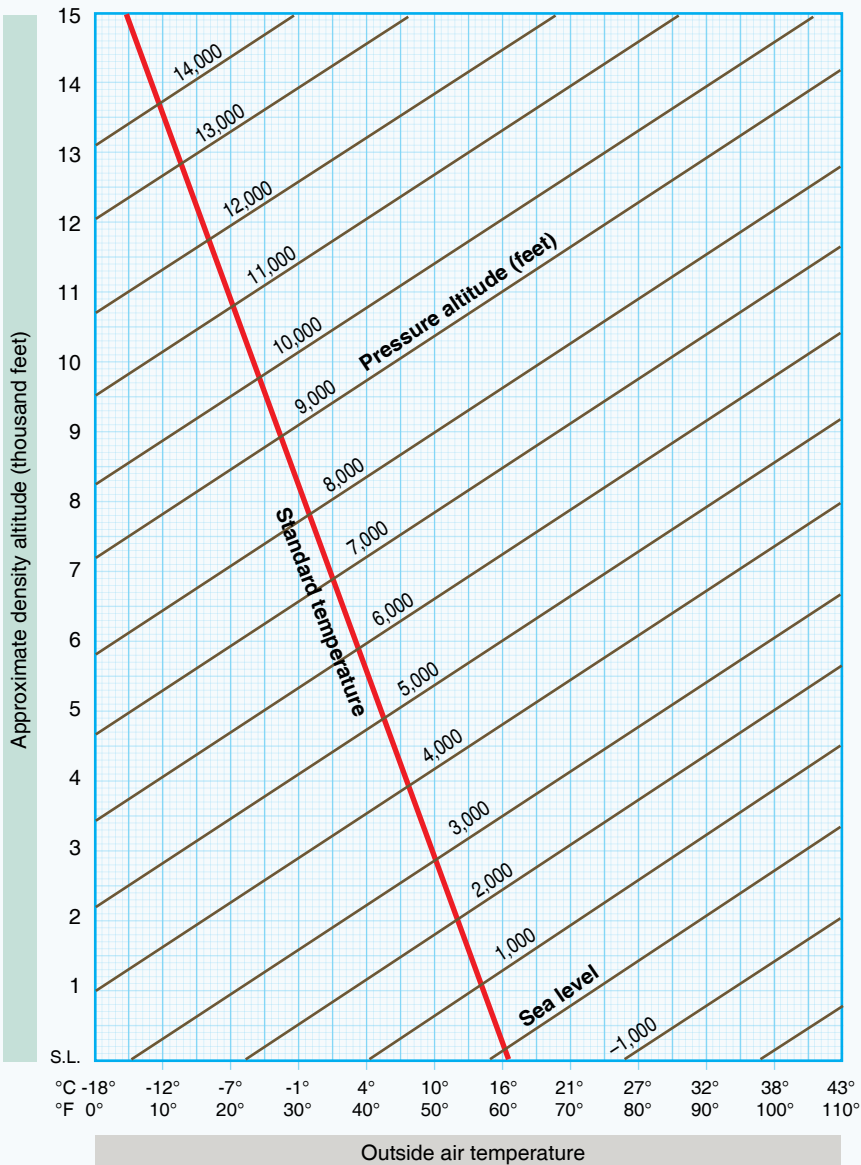


Figure 2. Load Factor Chart.

DENSITY ALTITUDE CHART



Altimeter setting ("Hg)	Pressure altitude conversion factor
28.0	1,824
28.1	1,727
28.2	1,630
28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	-73
30.1	-165
30.2	-257
30.3	-348
30.4	-440
30.5	-531
30.6	-622
30.7	-712
30.8	-803
30.9	-893
31.0	-983

Figure 8. Density Altitude Chart.

Useful load weights and moments

Baggage or 5th seat occupant

ARM 140	
Weight	$\frac{\text{Moment}}{100}$
10	14
20	28
30	42
40	56
50	70
60	84
70	98
80	112
90	126
100	140
110	154
120	168
130	182
140	196
150	210
160	224
170	238
180	252
190	266
200	280
210	294
220	308
230	322
240	336
250	350
260	364
270	378

Occupants

Front seats ARM 85		Rear seats ARM 121	
Weight	$\frac{\text{Moment}}{100}$	Weight	$\frac{\text{Moment}}{100}$
120	102	120	145
130	110	130	157
140	119	140	169
150	128	150	182
160	136	160	194
170	144	170	206
180	153	180	218
190	162	190	230
200	170	200	242

Usable fuel

Main wing tanks ARM 75		
Gallons	Weight	$\frac{\text{Moment}}{100}$
5	30	22
10	60	45
15	90	68
20	120	90
25	150	112
30	180	135
35	210	158
40	240	180
44	264	198

Auxiliary wing tanks ARM 94

Gallons	Weight	$\frac{\text{Moment}}{100}$
5	30	28
10	60	56
15	90	85
19	114	107

*Oil

Quarts	Weight	$\frac{\text{Moment}}{100}$
10	19	5

*Included in basic empty weight.

Empty weight~2,015

MOM/100~1,554

Moment limits vs weight

Moment limits are based on the following weight and center of gravity limit data (landing gear down).

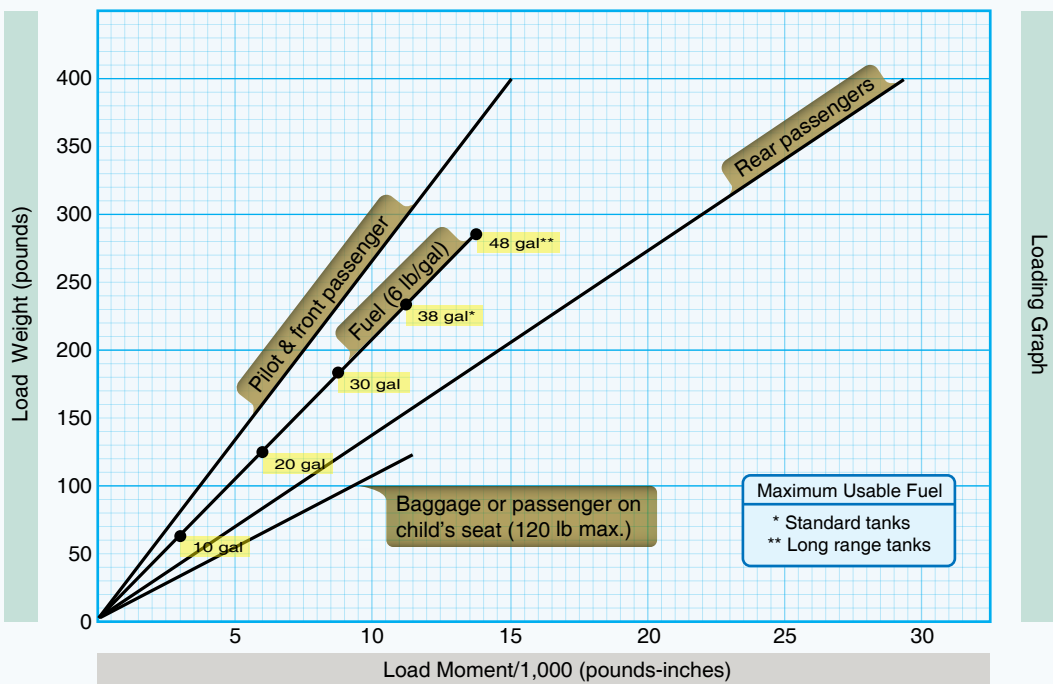
Weight condition	Forward CG limit	AFT CG limit
2,950 lb (takeoff or landing)	82.1	84.7
2,525 lb	77.5	85.7
2,475 lb or less	77.0	85.7

Figure 32. Airplane Weight and Balance Tables.

Moment limits vs weight (continued)

Weight	Minimum Moment 100	Maximum Moment 100	Weight	Minimum Moment 100	Maximum Moment 100
2,100	1,617	1,800	2,500	1,932	2,143
2,110	1,625	1,808	2,510	1,942	2,151
2,120	1,632	1,817	2,520	1,953	2,160
2,130	1,640	1,825	2,530	1,963	2,168
2,140	1,648	1,834	2,540	1,974	2,176
2,150	1,656	1,843	2,550	1,984	2,184
2,160	1,663	1,851	2,560	1,995	2,192
2,170	1,671	1,860	2,570	2,005	2,200
2,180	1,679	1,868	2,580	2,016	2,208
2,190	1,686	1,877	2,590	2,026	2,216
2,200	1,694	1,885	2,600	2,037	2,224
2,210	1,702	1,894	2,610	2,048	2,232
2,220	1,709	1,903	2,620	2,058	2,239
2,230	1,717	1,911	2,630	2,069	2,247
2,240	1,725	1,920	2,640	2,080	2,255
2,250	1,733	1,928	2,650	2,090	2,263
2,260	1,740	1,937	2,660	2,101	2,271
2,270	1,748	1,945	2,670	2,112	2,279
2,280	1,756	1,954	2,680	2,123	2,287
2,290	1,763	1,963	2,690	2,133	2,295
2,300	1,771	1,971	2,700	2,144	2,303
2,310	1,779	1,980	2,710	2,155	2,311
2,320	1,786	1,988	2,720	2,166	2,319
2,330	1,794	1,997	2,730	2,177	2,326
2,340	1,802	2,005	2,740	2,188	2,334
2,350	1,810	2,014	2,750	2,199	2,342
2,360	1,817	2,023	2,760	2,210	2,350
2,370	1,825	2,031	2,770	2,221	2,358
2,380	1,833	2,040	2,780	2,232	2,366
2,390	1,840	2,048	2,790	2,243	2,374
2,400	1,848	2,057	2,800	2,254	2,381
2,410	1,856	2,065	2,810	2,265	2,389
2,420	1,863	2,074	2,820	2,276	2,397
2,430	1,871	2,083	2,830	2,287	2,405
2,440	1,879	2,091	2,840	2,298	2,413
2,450	1,887	2,100	2,850	2,309	2,421
2,460	1,894	2,108	2,860	2,320	2,428
2,470	1,902	2,117	2,870	2,332	2,436
2,480	1,911	2,125	2,880	2,343	2,444
2,490	1,921	2,134	2,890	2,354	2,452
			2,900	2,365	2,460
			2,910	2,377	2,468
			2,920	2,388	2,475
			2,930	2,399	2,483
			2,940	2,411	2,491
			2,950	2,422	2,499

Figure 33. Airplane Weight and Balance Tables.



Notes: 1. Lines representing adjustable seats show the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant CG range.

2. Engine Oil: 8 qt = 15 lb at -0.2 Moment/1,000

Note: The empty weight of this airplane does not include the weight of the oil.

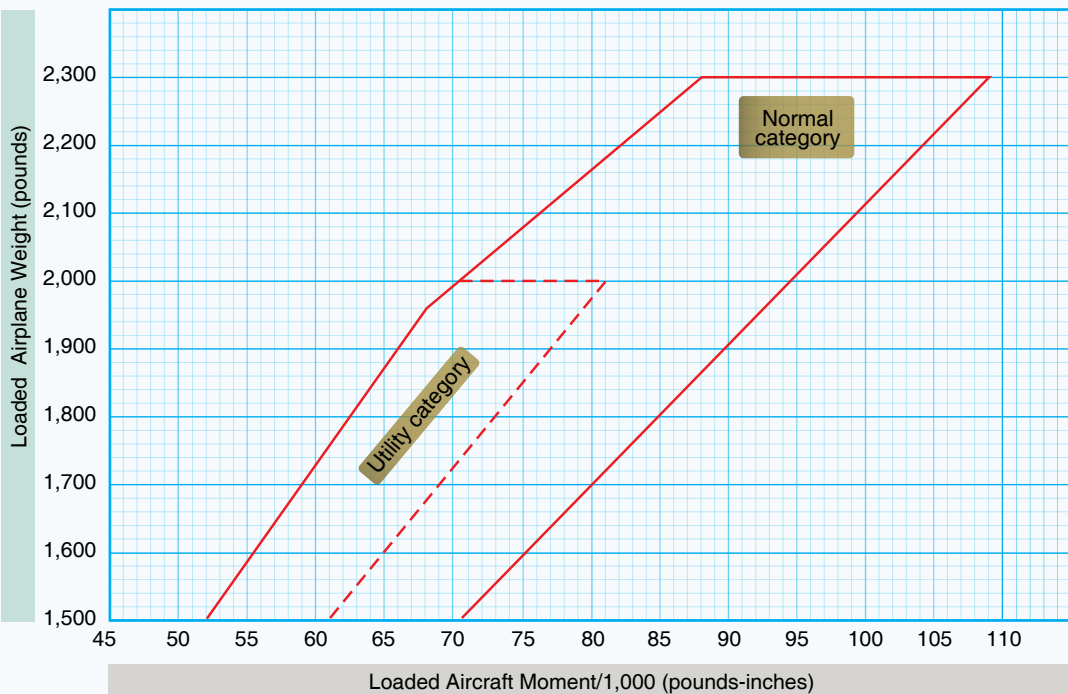


Figure 34. Airplane Weight and Balance Graphs.

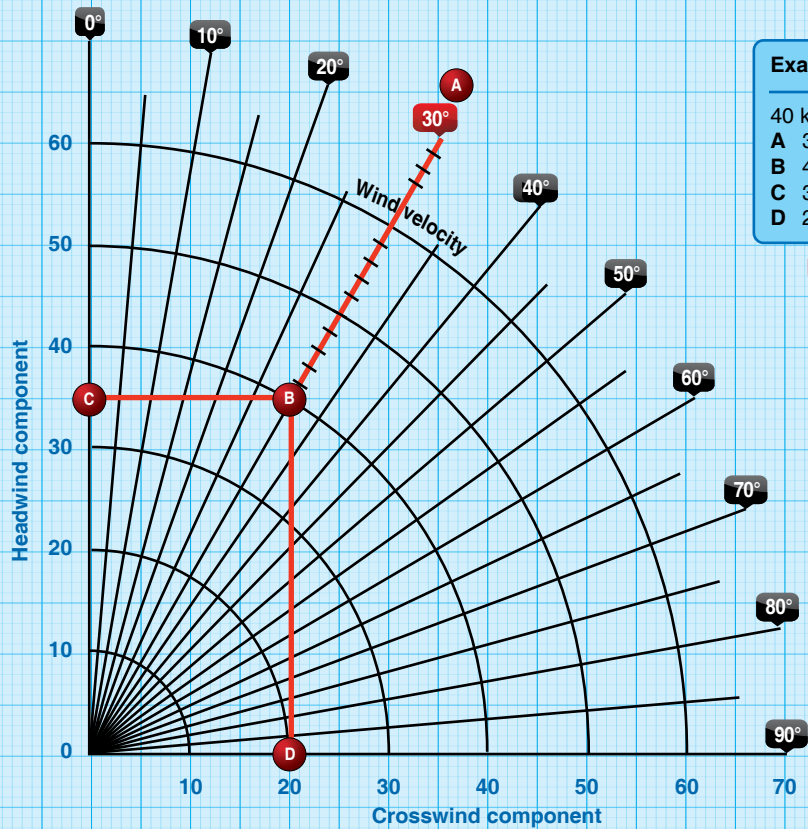
Figure 35. Airplane Power Setting Table.

Cruise power settings

65% Maximum continuous power (or full throttle 2,800 pounds)

Press ALT.	ISA -20 °C (-36 °F)								Standard day (ISA)								ISA +20 °C (+36 °F)							
	IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS	
	Feet	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS
SL	27	-3	2,450	20.7	6.6	11.5	147	169	63	17	2,450	21.2	6.6	11.5	150	173	99	37	2,450	21.8	6.6	11.5	153	176
2,000	19	-7	2,450	20.4	6.6	11.5	149	171	55	13	2,450	21.0	6.6	11.5	153	176	91	33	2,450	21.5	6.6	11.5	156	180
4,000	12	-11	2,450	20.1	6.6	11.5	152	175	48	9	2,450	20.7	6.6	11.5	156	180	84	29	2,450	21.3	6.6	11.5	159	183
6,000	5	-15	2,450	19.8	6.6	11.5	155	178	41	5	2,450	20.4	6.6	11.5	158	182	79	26	2,450	21.0	6.6	11.5	161	185
8,000	-2	-19	2,450	19.5	6.6	11.5	157	181	36	2	2,450	20.2	6.6	11.5	161	185	72	22	2,450	20.8	6.6	11.5	164	189
10,000	-8	-22	2,450	19.2	6.6	11.5	160	184	28	-2	2,450	19.9	6.6	11.5	163	188	64	18	2,450	20.3	6.5	11.4	166	191
12,000	-15	-26	2,450	18.8	6.4	11.5	162	186	21	-6	2,450	18.8	6.1	10.9	163	188	57	14	2,450	18.8	5.9	10.6	163	188
14,000	-22	-30	2,450	17.4	5.8	10.5	159	183	14	-10	2,450	17.4	5.6	10.1	160	184	50	10	2,450	17.4	5.4	9.8	160	184
16,000	-29	-34	2,450	16.1	5.3	9.7	156	180	7	-14	2,450	16.1	5.1	9.4	156	180	43	6	2,450	16.1	4.9	9.1	155	178

- Note: 1. Full throttle manifold pressure settings are approximate.
 2. Shaded area represents operation with full throttle.



Example:

- 40 knots wind at 30° angle
- A 30° angle between wind and runway
- B 40 knots total wind velocity
- C 35 knots headwind component
- D 20 knots crosswind component

Use plastic overlay

Figure 36. Crosswind Component Graph.

Figure 37. Airplane Landing Distance Graph.

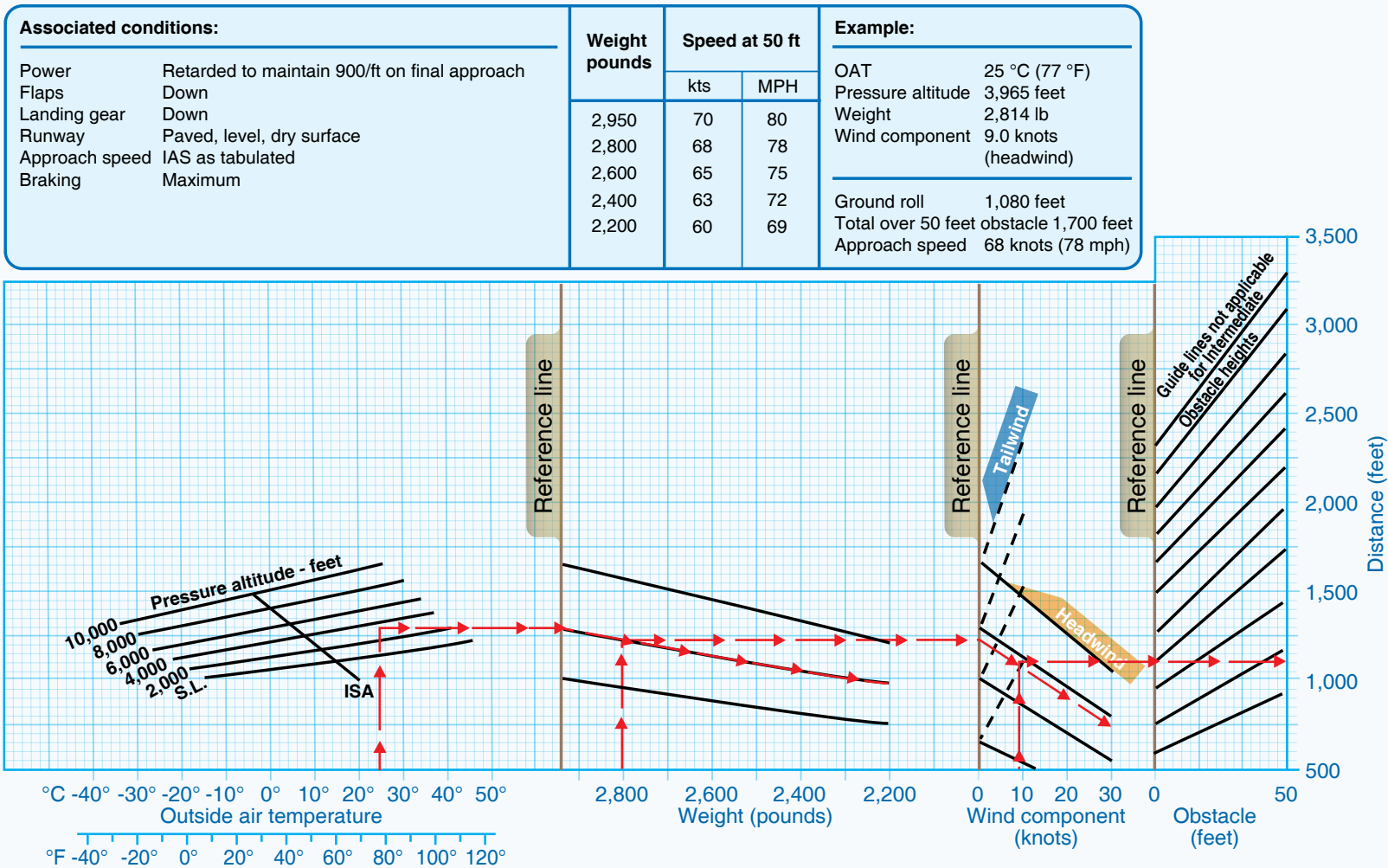


Figure 38. Airplane Landing Distance Table.

Landing distance									
Flaps lowered to 40° – Power off Hard surface runway – Zero wind									
Gross weight lb	Approach speed, IAS, MPH	At sea level & 59 °F		At 2,500 feet & 50 °F		At 5,000 feet & 41 °F		At 7,500 feet & 32 °F	
		Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS	Ground roll	Total to clear 50 feet OBS
1,600	60	445	1,075	470	1,135	495	1,195	520	1,255

NOTE:

1. Decrease the distances shown by 10% for each 4 knots of headwind.
2. Increase the distance by 10% for each 60 °F temperature increase above standard.
3. For operation on a dry, grass runway, increase distance (both “ground roll” and “total to clear 50 feet obstacle”) by 20% of the “total to clear 50 feet obstacle” figure.

Figure 40. Airplane Takeoff Distance Graph.

Example:

OAT	15 °C (59 °F)
Pressure altitude	5,650 feet
Takeoff weight	2,950 lb
Headwind comp.	9.0 knots

Ground roll	1,375 feet
Total distance over a 50 feet obstacle	2,300 feet
Takeoff speed at Lift-off	66 knots (76 mph)
50 feet	72 knots (83 mph)

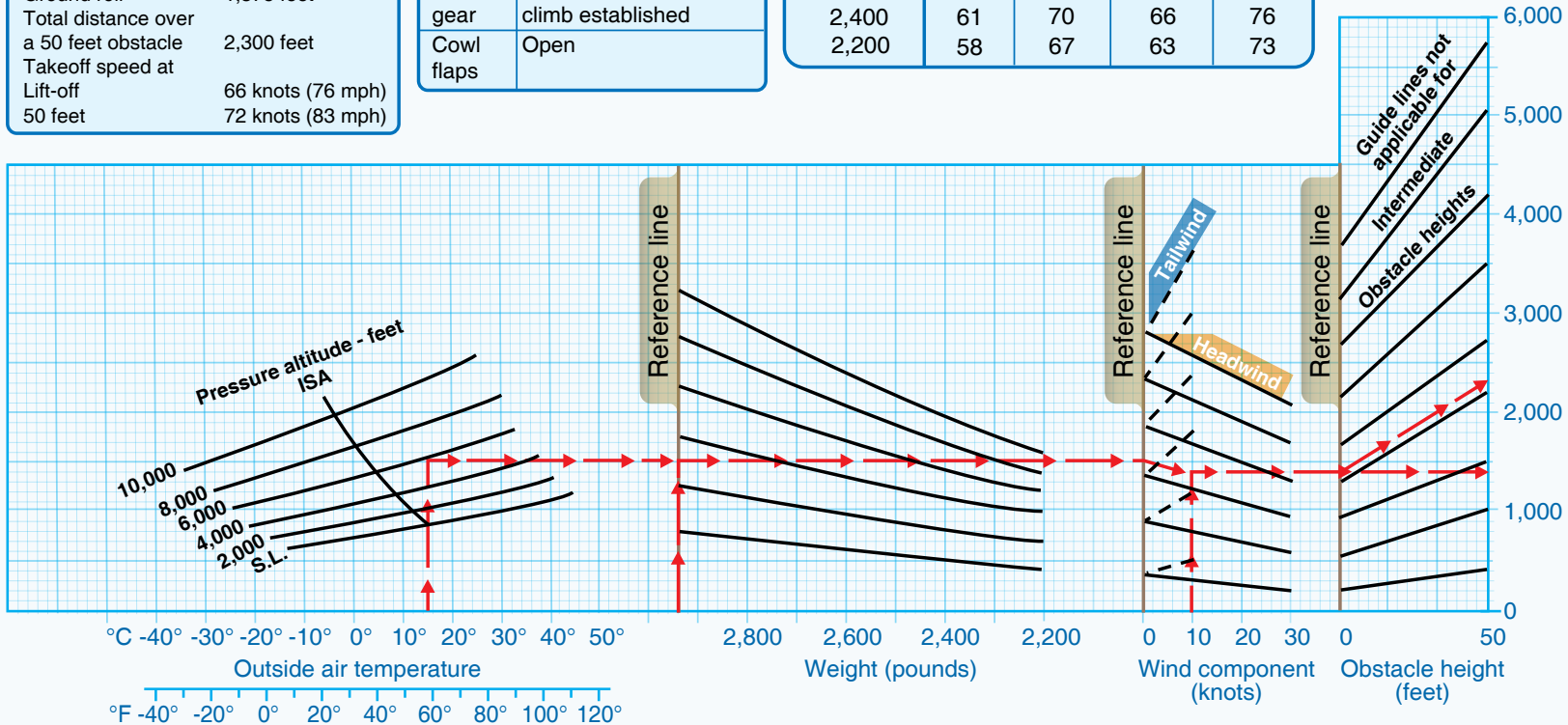
Associated conditions

Power	Full throttle 2,600 rpm
Mixture	Lean to appropriate fuel pressure
Flaps	Up
Landing gear	Retract after positive climb established
Cowl flaps	Open

Weight pounds

Takeoff speed

Weight pounds	Lift-off		50 ft	
	kts	MPH	kts	MPH
2,950	66	76	72	83
2,800	64	74	70	81
2,600	63	72	68	78
2,400	61	70	66	76
2,200	58	67	63	73



6,000
5,000
4,000
3,000
2,000
1,000
0

Guide lines not applicable for
Intermediate
Obstacle heights

Reference line

Reference line

Reference line

Tailwind
Headwind

Weight (pounds)

Wind component (knots)

Obstacle height (feet)

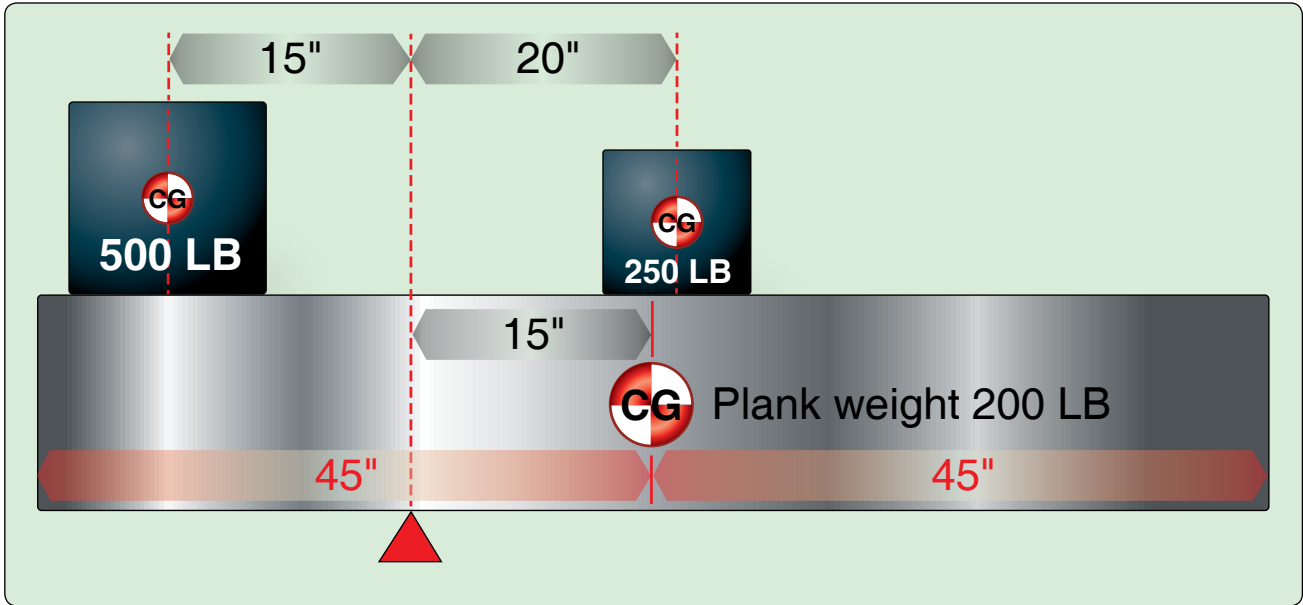


Figure 60. Weight and Balance Diagram.

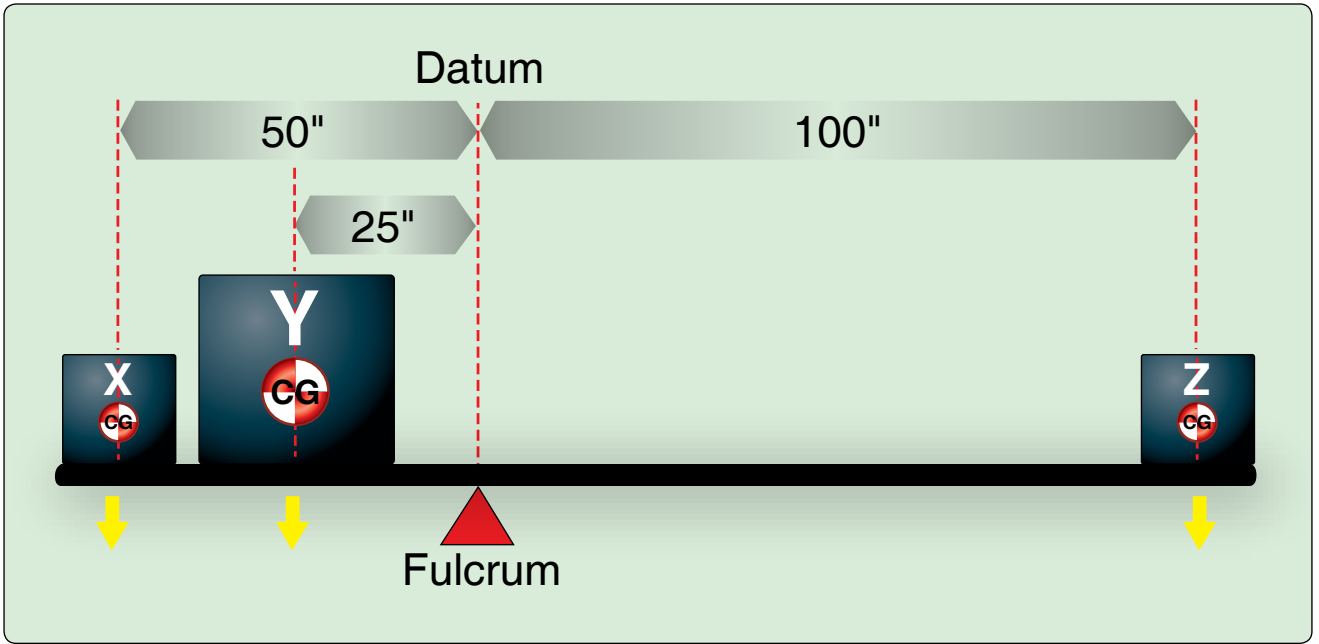


Figure 61. Weight and Balance Diagram.

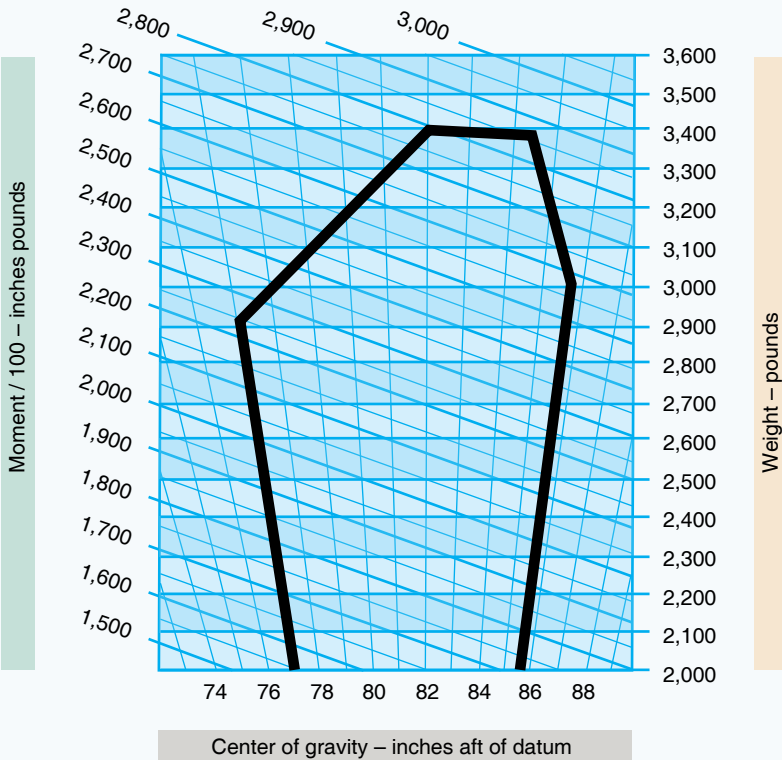
Empty Weight Data		
*Oil is included in empty weight	Empty Weight (pounds)	Empty Weight Moment (/100)
	Certificated Weight	2,110

Fuel					
ARM 75 inches					
Gallons	Weight (pounds)	Moment (in-lb)	Gallons	Weight (pounds)	Moment (in-lb)
5	30	23	45	270	203
10	60	45	49	294	221
15	90	68	55	330	248
20	120	90	60	360	270
25	150	113	65	390	293
30	180	135	70	420	315
35	210	158	75	450	338
40	240	180	80	480	360

Occupants				
Front seats		Rear seats		
ARM 85 inches		Fwd Position ARM 111 inches		Alt Position ARM 136 inches
Weight (pounds)	Moment (in-lb)	Weight (pounds)	Moment (in-lb)	Moment (in-lb)
120	102	120	133	163
130	111	130	144	177
140	119	140	155	190
150	128	150	167	204
160	136	160	178	218
170	145	170	189	231
180	153	180	200	245
190	162	190	211	258
200	170	200	222	273

Baggage	
ARM 150	
Weight (pounds)	Moment (in-lb)
10	15
20	30
30	45
40	60
50	75
60	90
70	105
80	120
90	135
100	150
110	165
120	180
130	195
140	210
150	225
160	240
170	255
180	270
190	285
200	300
210	315
220	330
230	345
240	360
250	375
260	390
270	405

Gross Weight Moment Limits



NOTE: All moments are equal to

$$\frac{\text{weight} \times \text{arm}}{100}$$

Figure 67. Weight and Balance Chart.

Figure 72. Velocity vs. G-Loads.

