

N6211E Accident

Take off Distance

For takeoff the following assumptions were used: 2810 lbs, Temp = 15C; headwind/tailwind = 0; grass, short, firm (increases ground roll 15%); Runway flat; Flaps at 20 degrees; Power set properly before brake release; Takeoff roll began at or before reference point; Proper speeds and technique were used; Engine operated within specifications.

The preliminary calculations;

Gnd roll @ 10 C = 670 ft; @20 C = 720 ft.

Gnd roll @ 15 C = $670 + 1/2(720 - 670) = 695$ ft.

Gnd roll on grass (+ 15%) = $695 + 0.15(695) = 799$ ft.

Distance to climb to 50 ft AGL:

Dist. @ 10 C = $(1260 - 670) = 590$ ft.

Dist. @20 C = $(1350 - 720) = 630$ ft.

Dist. @ 15 C = $590 + 1/2(630 - 590) = 610$ ft.

Takeoff distance to 50 ft. @ 15 C = $799 + 610 = 1409$ ft.

Takeoff distance to 35 ft. @ 15 C = $799 + 35/50(610) = 1226$ ft.

TAKEOFF DISTANCE
2800 LBS AND 2600 LBS
SHORT FIELD

REFER TO SHEET 1 FOR APPROPRIATE CONDITIONS AND NOTES.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	5°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS
2800	48	36	S.L.	675	1060	615	1155	680	1235	710	1320	780	1410
			1000	625	1175	670	1260	720	1350	770	1440	825	1500
			2000	680	1285	730	1375	780	1475	840	1560	900	1590
			3000	740	1405	800	1505	850	1615	920	1700	965	1660
			4000	810	1540	870	1655	925	1780	1005	1870	1075	2050
			5000	885	1695	955	1825	1025	1965	1100	2115	1160	2200
			6000	970	1875	1045	2025	1125	2185	1210	2355	1295	2545
			7000	1070	2085	1160	2255	1235	2440	1330	2640	1425	2865
			8000	1175	2340	1285	2525	1380	2745	1485	2990	1570	3265
			2600	46	52	S.L.	445	645	475	600	510	660	545
1000	485	615				520	575	555	1040	595	1110	635	1135
2000	525	685				565	635	605	1135	650	1210	695	1230
3000	570	765				615	705	660	1235	705	1320	765	1410
4000	625	865				675	785	720	1350	770	1445	825	1545
5000	690	985				755	885	795	1485	845	1590	905	1700
6000	765	1135				845	1020	880	1630	925	1760	990	1875
7000	845	1315				945	1175	985	1805	1015	1935	1085	2090
8000	930	1525				1065	1365	1095	2005	1115	2165	1185	2330

Figure 3-5. Takeoff Distance (Sheet 2 of 2)

5-13

TAKEOFF DISTANCE

MAXIMUM WEIGHT 3100 LBS

SECTION 5
PERFORMANCE

CONDITIONS:
 Flaps 20°
 2400 RPM, Full Throttle and Mixture Set Prior to
 Brake Release
 Cool Flaps Open
 Level, Dry Runway
 Zero Wind

SHORT FIELD

- NOTES:**
1. Short field technique as specified in Section 4.
 2. Prior to takeoff from fields above 5000-foot elevation, the mixture should be leaned to give maximum power in a full throttle, steady run-up.
 3. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
 4. Where distance value has been deleted, climb performance after lift-off is less than 150 fpm at takeoff speed.
 5. For operation on a dry, grass runway, increase distances by 10% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND	TOTAL FT	GRND	TOTAL FT	GRND	TOTAL FT	GRND	TOTAL FT	GRND	TOTAL FT
				ROLL FT	TO CLEAR 50 FT OBS	ROLL FT	TO CLEAR 50 FT OBS	ROLL FT	TO CLEAR 50 FT OBS	ROLL FT	TO CLEAR 50 FT OBS	ROLL FT	TO CLEAR 50 FT OBS
3100	60	50	S.L.	720	1365	775	1485	836	1570	896	1680	956	1800
			1000	785	1490	845	1600	910	1720	975	1845	1045	1980
			2000	860	1625	925	1760	995	1880	1065	2035	1140	2185
			3000	940	1800	1015	1940	1085	2090	1165	2255	1250	2430
			4000	1025	1950	1105	2180	1190	2320	1275	2510	1370	2715
			5000	1125	2150	1215	2395	1305	2565	1400	2815	1505	3080
			6000	1235	2470	1330	2685	1435	2825	1540	3180	1650	3490
			7000	1380	2780	1485	3040	1560	3330	1700	3695	---	---
8000	1500	3170	1615	3485	1740	3855	---	---	---	---			

30 August 1995

Figure 5-5. Takeoff Distance (Sheet 1 of 2)

ORBITAL
MODEL 1000

INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in Section 9.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum takeoff weight or maximum landing weight, and may be used for any lesser weight. However, to achieve the performance specified in Section 5 for takeoff distance, the speed appropriate to the particular weight must be used.

Takeoff:	
Normal Climb Out	70-80 KIAS
Short Field Takeoff, Flaps 20°, Speed at 50 Feet	59 KIAS
Enroute Climb, Flaps Up:	
Normal	85-95 KIAS
Best Rate of Climb, Sea Level	81 KIAS
Best Rate of Climb, 10,000 Feet	75 KIAS
Best Angle of Climb, Sea Level	59 KIAS
Best Angle of Climb, 10,000 Feet	86 KIAS
Landing Approach (2950 Lbs):	
Normal Approach, Flaps Up	70-80 KIAS
Normal Approach, Flaps FULL	60-70 KIAS
Short Field Approach, Flaps FULL	81 KIAS
Balked Landing (2950 Lbs):	
Maximum Power, Flaps 20°	55 KIAS
Maximum Recommended Turbulent Air Penetration Speed:	
3100 Lbs	111 KIAS
2600 Lbs	102 KIAS
2000 Lbs	86 KIAS
Maximum Demonstrated Crosswind Velocity:	
Takeoff or Landing	15 KNOTS

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- 0° - 20°.
2. Carburetor Heat -- COLD.
3. Power -- FULL THROTTLE and 2400 RPM.
4. Mixture -- FULL RICH (mixture may be leaned above 5000 feet for smooth operation).
5. Elevator Control -- LIFT NOSE WHEEL at 50 KIAS.
6. Climb Speed -- 70 KIAS (flaps 20°).
80 KIAS (flaps UP).
7. Wing Flaps -- RETRACT.

SHORT FIELD TAKEOFF

1. Wing Flaps -- 20°.
2. Carburetor Heat -- COLD.
3. Brakes -- APPLY.
4. Power -- FULL THROTTLE and 2400 RPM.
5. Mixture -- FULL RICH (mixture may be leaned above 5000 feet for smooth operation).
6. Brakes -- RELEASE.
7. Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
8. Climb Speed -- 59 KIAS (until all obstacles are cleared).
9. Wing Flaps -- RETRACT slowly after reaching 70 KIAS.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 85-95 KIAS.
2. Power -- 23 INCHES Hg or FULL THROTTLE (whichever is less) and 2400 RPM.
3. Fuel Selector Valve -- BOTH.
4. Mixture -- FULL RICH (mixture may be leaned above 5000 feet for smooth engine operation).
5. Cowl Flaps -- OPEN as required.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 81 KIAS at sea level to 75 KIAS at 10,000 feet.
2. Power -- FULL THROTTLE and 2400 RPM.
3. Fuel Selector Valve -- BOTH.

TAKEOFF DISTANCE MAXIMUM WEIGHT 3100 LBS

SECTION 5
PERFORMANCE

CONDITIONS:
Flaps 20°
2400 RPM, Full Throttle and Mixture Set Prior to
Brake Release
Cowl Flaps Open
Paved, Level, Dry Runway
Zero Wind

SHORT FIELD

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 5000 feet elevation, the mixture should be leaned to give maximum power in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
4. Where distance value has been deleted, climb performance after lift-off is less than 150 fpm at takeoff speed.
5. For operation on a dry, grass runway, increase distances by 15% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
				GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS
				LIFT OFF	AT 50 FT								
3100	50	59	S.L.	720	1365	775	1465	835	1570	895	1680	955	1800
			1000	785	1490	845	1600	910	1720	975	1845	1045	1980
			2000	860	1635	925	1760	995	1890	1065	2035	1140	2185
			3000	940	1800	1010	1940	1085	2090	1165	2255	1250	2430
			4000	1025	1990	1105	2150	1190	2320	1275	2510	1370	2715
			5000	1125	2210	1215	2395	1305	2595	1400	2815	1505	3060
			6000	1235	2470	1330	2685	1435	2925	1540	3190	1655	3490
			7000	1360	2780	1465	3040	1580	3330	1700	3665	---	---
			8000	1500	3170	1615	3485	1740	3855	---	---	---	---

Figure 5-5. Takeoff Distance (Sheet 1 of 2)

CESSNA
MODEL 182R

TAKEOFF DISTANCE 2800 LBS AND 2500 LBS

SHORT FIELD

REFER TO SHEET 1 FOR APPROPRIATE CONDITIONS AND NOTES.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
				GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS	GRND ROLL FT	TOTAL FT TO CLEAR 50 FT OBS
				LIFT OFF	AT 50 FT								
2800	48	56	S.L.	575	1080	615	1155	660	1235	710	1320	760	1410
			1000	625	1175	670	1260	720	1350	770	1440	825	1540
			2000	680	1285	730	1375	785	1475	840	1580	900	1690
			3000	740	1405	800	1505	855	1615	920	1735	985	1860
			4000	810	1540	870	1655	935	1780	1005	1910	1075	2050
			5000	885	1695	955	1825	1025	1965	1100	2115	1180	2280
			6000	970	1875	1045	2025	1125	2185	1210	2355	1295	2545
			7000	1070	2085	1150	2255	1235	2440	1330	2640	1425	2865
			8000	1175	2330	1265	2525	1360	2745	1465	2990	1570	3265
2500	45	53	S.L.	445	845	475	900	510	960	545	1020	585	1085
			1000	485	915	520	975	555	1040	595	1110	635	1185
			2000	525	995	565	1060	605	1135	650	1210	695	1290
			3000	570	1080	615	1155	660	1235	705	1320	755	1410
			4000	625	1180	670	1265	720	1350	770	1445	825	1545
			5000	680	1290	735	1385	790	1480	845	1590	905	1700
			6000	745	1415	805	1520	860	1630	925	1750	990	1875
			7000	820	1560	880	1675	945	1800	1015	1935	1085	2080
			8000	900	1725	965	1855	1040	2000	1115	2155	1195	2320

Figure 5-5. Takeoff Distance (Sheet 2 of 2)

CESSNA
MODEL 182R

SECTION 5
PERFORMANCE