

Pilot's Operating Handbook and FAA Approved Flight Manual Supplement for Cessna 172R

STALL SPEEDS AT 2550 POUNDS

Conditions:
Power Off

MOST REARWARD CENTER OF GRAVITY

| FLAP SETTING | ANGLE OF BANK | | | | | | | |
|--------------|---------------|------|------|------|------|------|------|------|
| | 0° | | 30° | | 45° | | 60° | |
| | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| UP | 48 | 53 | 52 | 57 | 57 | 63 | 68 | 75 |
| 10° | 42 | 50 | 45 | 54 | 50 | 59 | 59 | 71 |
| 30° | 40 | 48 | 43 | 52 | 48 | 57 | 57 | 68 |

MOST FORWARD CENTER OF GRAVITY

| FLAP SETTING | ANGLE OF BANK | | | | | | | |
|--------------|---------------|------|------|------|------|------|------|------|
| | 0° | | 30° | | 45° | | 60° | |
| | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| UP | 48 | 53 | 52 | 57 | 57 | 63 | 68 | 75 |
| 10° | 43 | 51 | 46 | 55 | 51 | 61 | 61 | 72 |
| 30° | 40 | 48 | 43 | 52 | 48 | 57 | 57 | 68 |

NOTES:

1. Altitude loss during a stall recovery may be as much as 230 feet.
2. KIAS values are approximate.

Figure 8
Stall Speeds

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**SHORT FIELD TAKEOFF DISTANCE
 AT 2550 POUNDS**

CONDITIONS:

Flaps 10°
 Full Throttle Prior to Brake Release
 Paved, level, dry runway
 Zero Wind
 Lift Off: 51 KIAS
 Speed at 50 Ft: 56 KIAS

| Press Alt In Feet | 0°C | | 10°C | | 20°C | | 30°C | | 40°C | |
|-------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|
| | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst |
| S. L. | 860 | 1465 | 925 | 1575 | 995 | 1690 | 1070 | 1810 | 1150 | 1945 |
| 1000 | 940 | 1600 | 1010 | 1720 | 1090 | 1850 | 1170 | 1990 | 1260 | 2135 |
| 2000 | 1025 | 1755 | 1110 | 1890 | 1195 | 2035 | 1285 | 2190 | 1380 | 2355 |
| 3000 | 1125 | 1925 | 1215 | 2080 | 1310 | 2240 | 1410 | 2420 | 1515 | 2605 |
| 4000 | 1235 | 2120 | 1335 | 2295 | 1440 | 2480 | 1550 | 2685 | 1660 | 2880 |
| 5000 | 1355 | 2345 | 1465 | 2545 | 1585 | 2755 | 1705 | 2975 | 1825 | 3205 |
| 6000 | 1495 | 2605 | 1615 | 2830 | 1745 | 3075 | 1875 | 3320 | 2010 | 3585 |
| 7000 | 1645 | 2910 | 1785 | 3170 | 1920 | 3440 | 2065 | 3730 | 2215 | 4045 |
| 8000 | 1820 | 3265 | 1970 | 3575 | 2120 | 3880 | 2280 | 4225 | 2450 | 4615 |

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 9
Short Field Takeoff Distance – 2550 lbs.

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 DATE: May 6, 2005

Pilot's Operating Handbook and FAA Approved Flight Manual Supplement for Cessna 172R

**SHORT FIELD TAKEOFF DISTANCE
 AT 2400 POUNDS**

CONDITIONS:

Flaps 10°
 Full Throttle Prior to Brake Release
 Paved, level, dry runway
 Zero Wind
 Lift Off: 48 KIAS
 Speed at 50 Ft: 54 KIAS

| Press Alt In Feet | 0°C | | 10°C | | 20°C | | 30°C | | 40°C | |
|-------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|
| | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst |
| S. L. | 745 | 1275 | 800 | 1370 | 860 | 1470 | 925 | 1570 | 995 | 1685 |
| 1000 | 810 | 1390 | 875 | 1495 | 940 | 1605 | 1010 | 1720 | 1085 | 1845 |
| 2000 | 885 | 1520 | 955 | 1635 | 1030 | 1760 | 1110 | 1890 | 1190 | 2030 |
| 3000 | 970 | 1665 | 1050 | 1795 | 1130 | 1930 | 1215 | 2080 | 1305 | 2230 |
| 4000 | 1065 | 1830 | 1150 | 1975 | 1240 | 2130 | 1335 | 2295 | 1430 | 2455 |
| 5000 | 1170 | 2015 | 1265 | 2180 | 1360 | 2355 | 1465 | 2530 | 1570 | 2715 |
| 6000 | 1285 | 2230 | 1390 | 2410 | 1500 | 2610 | 1610 | 2805 | 1725 | 3015 |
| 7000 | 1415 | 2470 | 1530 | 2685 | 1650 | 2900 | 1770 | 3125 | 1900 | 3370 |
| 8000 | 1560 | 2755 | 1690 | 3000 | 1815 | 3240 | 1950 | 3500 | 2095 | 3790 |

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 10
Short Field Takeoff Distance – 2400 lbs.

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DATE: May 6, 2005

Pilot's Operating Handbook and FAA Approved Flight Manual Supplement for Cessna 172R

**SHORT FIELD TAKEOFF DISTANCE
 AT 2200 POUNDS**

CONDITIONS:

Flaps 10°
 Full Throttle Prior to Brake Release
 Paved, level, dry runway
 Zero Wind
 Lift Off: 44 KIAS
 Speed at 50 Ft: 50 KIAS

| Press Alt In Feet | 0°C | | 10°C | | 20°C | | 30°C | | 40°C | |
|-------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|
| | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst |
| S. L. | 610 | 1055 | 655 | 1130 | 705 | 1205 | 760 | 1290 | 815 | 1380 |
| 1000 | 665 | 1145 | 720 | 1230 | 770 | 1315 | 830 | 1410 | 890 | 1505 |
| 2000 | 725 | 1250 | 785 | 1340 | 845 | 1435 | 905 | 1540 | 975 | 1650 |
| 3000 | 795 | 1365 | 860 | 1465 | 925 | 1570 | 995 | 1685 | 1065 | 1805 |
| 4000 | 870 | 1490 | 940 | 1605 | 1010 | 1725 | 1090 | 1855 | 1165 | 1975 |
| 5000 | 955 | 1635 | 1030 | 1765 | 1110 | 1900 | 1195 | 2035 | 1275 | 2175 |
| 6000 | 1050 | 1800 | 1130 | 1940 | 1220 | 2090 | 1310 | 2240 | 1400 | 2395 |
| 7000 | 1150 | 1985 | 1245 | 2145 | 1340 | 2305 | 1435 | 2475 | 1540 | 2650 |
| 8000 | 1270 | 2195 | 1370 | 2375 | 1475 | 2555 | 1580 | 2745 | 1695 | 2950 |

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 11
Short Field Takeoff Distance – 2200 lbs.

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MAXIMUM RATE-OF-CLIMB AT 2550 POUNDS

CONDITIONS:

Flaps Up
 Full Throttle

| PRESS ALT FT | CLIMB SPEED KIAS | RATE OF CLIMB - FPM | | | |
|--------------------|------------------------|---------------------|-----|------|------|
| | | -20°C | 0°C | 20°C | 40°C |
| S.L. | 74 | 855 | 785 | 710 | 645 |
| 2000 | 73 | 760 | 695 | 625 | 560 |
| 4000 | 73 | 685 | 620 | 555 | 495 |
| 6000 | 73 | 575 | 515 | 450 | 390 |
| 8000 | 72 | 465 | 405 | 345 | 285 |
| 10,000 | 72 | 360 | 300 | 240 | 180 |
| 12,000 | 72 | 255 | 195 | 135 | --- |

NOTE:

1. Mixture leaned above 3,000 feet for maximum RPM.

Figure 12
Maximum Rate of Climb

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**TIME, FUEL AND DISTANCE TO CLIMB
 AT 2550 POUNDS**

CONDITIONS:

Flaps Up
 Full Throttle
 Standard Temperature

| PRESS ALT FT | CLIMB SPEED KIAS | RATE OF CLIMB FPM | FROM SEA LEVEL | | |
|--------------------|------------------------|----------------------------|-------------------|---------------------|------------|
| | | | TIME IN MIN | FUEL USED GAL | DIST NM |
| S.L. | 74 | 730 | 0 | 0.0 | 0 |
| 1000 | 73 | 695 | 1 | 0.4 | 2 |
| 2000 | 73 | 655 | 3 | 0.8 | 4 |
| 3000 | 73 | 620 | 4 | 1.2 | 6 |
| 4000 | 73 | 600 | 6 | 1.5 | 8 |
| 5000 | 73 | 550 | 8 | 1.9 | 10 |
| 6000 | 73 | 505 | 10 | 2.2 | 13 |
| 7000 | 73 | 455 | 12 | 2.6 | 16 |
| 8000 | 72 | 410 | 14 | 3.0 | 19 |
| 9000 | 72 | 360 | 17 | 3.4 | 22 |
| 10,000 | 72 | 315 | 20 | 3.9 | 27 |
| 11,000 | 72 | 265 | 24 | 4.4 | 32 |
| 12,000 | 72 | 220 | 28 | 5.0 | 38 |

NOTES:

1. Add 1.4 gallons of fuel for engine start, taxi and takeoff allowance.
2. Mixture leaned above 3,000 feet for maximum RPM.
3. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
4. Distances shown are based on zero wind.

Figure 13
Time, Fuel and Distance to Climb

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 DATE: May 6, 2005

Pilot's Operating Handbook and FAA Approved Flight Manual Supplement for Cessna 172R

CRUISE PERFORMANCE

CONDITIONS:
 2550 Pounds
 Recommended Lean Mixture At All Altitudes (Refer to Section 4, Cruise)

| PRESS ALT FT | RPM | 20°C BELOW STANDARD TEMP | | | STANDARD TEMPERATURE | | | 20°C ABOVE STANDARD TEMP | | |
|--------------|------|--------------------------|------|------|----------------------|------|------|--------------------------|------|-----|
| | | % BHP | KTAS | GPH | % BHP | KTAS | GPH | % BHP | KTAS | GPH |
| 2000 | 2550 | 83 | 117 | 11.1 | 77 | 118 | 10.5 | 72 | 117 | 9.9 |
| | 2500 | 78 | 115 | 10.6 | 73 | 115 | 9.9 | 68 | 115 | 9.4 |
| | 2400 | 69 | 111 | 9.6 | 64 | 110 | 9.0 | 60 | 109 | 8.5 |
| | 2300 | 61 | 105 | 8.6 | 57 | 104 | 8.1 | 53 | 102 | 7.7 |
| | 2200 | 53 | 99 | 7.7 | 50 | 97 | 7.3 | 47 | 95 | 6.9 |
| | 2100 | 47 | 92 | 6.9 | 44 | 90 | 6.6 | 42 | 89 | 6.3 |
| 4000 | 2600 | 83 | 120 | 11.1 | 77 | 120 | 10.4 | 72 | 119 | 9.8 |
| | 2550 | 79 | 118 | 10.6 | 73 | 117 | 9.9 | 68 | 117 | 9.4 |
| | 2500 | 74 | 115 | 10.1 | 69 | 115 | 9.5 | 64 | 114 | 8.9 |
| | 2400 | 65 | 110 | 9.1 | 61 | 109 | 8.5 | 57 | 107 | 8.1 |
| | 2300 | 58 | 104 | 8.2 | 54 | 102 | 7.7 | 51 | 101 | 7.3 |
| | 2200 | 51 | 98 | 7.4 | 48 | 96 | 7.0 | 45 | 94 | 6.7 |
| 6000 | 2650 | 83 | 122 | 11.1 | 77 | 122 | 10.4 | 72 | 121 | 9.8 |
| | 2600 | 78 | 120 | 10.6 | 73 | 119 | 9.9 | 68 | 118 | 9.4 |
| | 2500 | 70 | 115 | 9.6 | 65 | 114 | 9.0 | 60 | 112 | 8.5 |
| | 2400 | 62 | 109 | 8.6 | 57 | 108 | 8.2 | 54 | 106 | 7.7 |
| | 2300 | 54 | 103 | 7.8 | 51 | 101 | 7.4 | 48 | 99 | 7.0 |
| | 2200 | 48 | 96 | 7.1 | 45 | 94 | 6.7 | 43 | 92 | 6.4 |

NOTE:

1. Cruise speeds are shown for an airplane equipped with speed fairings. Without speed fairings, decrease speeds shown by 2 knots.

Figure 14
Cruise Performance

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Pilot's Operating Handbook and FAA Approved Flight Manual Supplement for Cessna 172R

CRUISE PERFORMANCE

CONDITIONS:
2550 Pounds
Recommended Lean Mixture At All Altitudes (Refer to Section 4, Cruise)

| PRESS ALT FT | RPM | 20°C BELOW STANDARD TEMP | | | STANDARD TEMPERATURE | | | 20°C ABOVE STANDARD TEMP | | |
|--------------|------|--------------------------|------|------|----------------------|------|------|--------------------------|------|-----|
| | | % BHP | KTAS | GPH | % BHP | KTAS | GPH | % BHP | KTAS | GPH |
| 8000 | 2700 | 83 | 125 | 11.1 | 77 | 124 | 10.4 | 71 | 123 | 9.7 |
| | 2650 | 78 | 122 | 10.5 | 72 | 122 | 9.9 | 67 | 120 | 9.3 |
| | 2600 | 74 | 120 | 10.0 | 68 | 119 | 9.4 | 64 | 117 | 8.9 |
| | 2500 | 65 | 114 | 9.1 | 61 | 112 | 8.6 | 57 | 111 | 8.1 |
| | 2400 | 58 | 108 | 8.2 | 54 | 106 | 7.8 | 51 | 104 | 7.4 |
| | 2300 | 52 | 101 | 7.5 | 48 | 99 | 7.1 | 46 | 97 | 6.8 |
| | 2200 | 46 | 94 | 6.8 | 43 | 92 | 6.5 | 41 | 90 | 6.2 |
| 10,000 | 2700 | 78 | 124 | 10.5 | 72 | 123 | 9.8 | 67 | 122 | 9.3 |
| | 2650 | 73 | 122 | 10.0 | 68 | 120 | 9.4 | 63 | 119 | 8.9 |
| | 2600 | 69 | 119 | 9.5 | 64 | 117 | 9.0 | 60 | 115 | 8.5 |
| | 2500 | 62 | 113 | 8.7 | 57 | 111 | 8.2 | 54 | 109 | 7.8 |
| | 2400 | 55 | 106 | 7.9 | 51 | 104 | 7.5 | 49 | 102 | 7.1 |
| | 2300 | 49 | 100 | 7.2 | 46 | 97 | 6.8 | 44 | 95 | 6.5 |
| 12,000 | 2650 | 69 | 121 | 9.5 | 64 | 119 | 8.9 | 60 | 117 | 8.5 |
| | 2600 | 65 | 118 | 9.1 | 61 | 116 | 8.5 | 57 | 114 | 8.1 |
| | 2500 | 58 | 111 | 8.3 | 54 | 109 | 7.8 | 51 | 107 | 7.4 |
| | 2400 | 52 | 105 | 7.5 | 49 | 102 | 7.1 | 46 | 100 | 6.8 |
| | 2300 | 47 | 98 | 6.9 | 44 | 95 | 6.6 | 41 | 92 | 6.3 |

NOTE:

1. Cruise speeds are shown for an airplane equipped with speed fairings. Without speed fairings, decrease speeds shown by 2 knots.

Figure 15
Cruise Performance

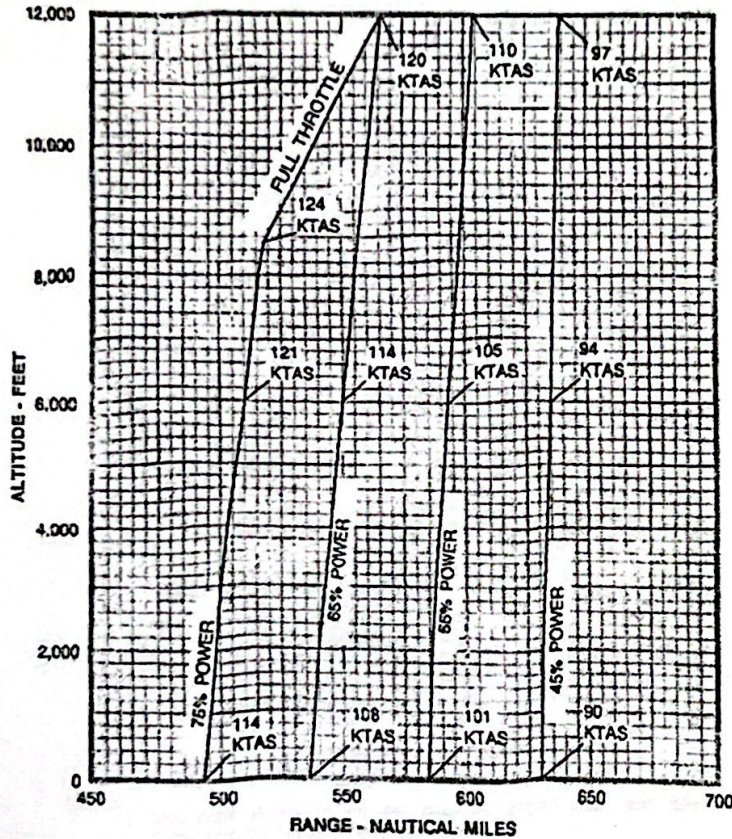
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RANGE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature
Zero Wind



- NOTE:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb.
 2. Performance is shown for an airplane equipped with speed fairings, which increase the cruise speeds by approximately 2 knots.

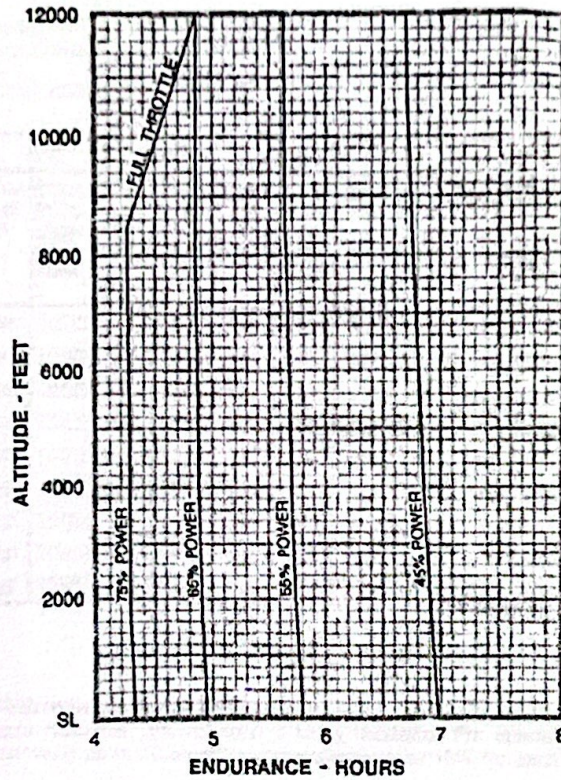
Figure 16
Range Profile

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ENDURANCE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature



NOTE:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb.

Figure 17
Endurance Profile

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**SHORT FIELD LANDING DISTANCE
 AT 2550 POUNDS**

CONDITIONS:

Flaps 30°
 Power Off
 Maximum Braking
 Paved, level, dry runway
 Zero Wind
 Speed at 50 Ft: 61 KIAS

| Press Alt In Feet | 0°C | | 10°C | | 20°C | | 30°C | | 40°C | |
|-------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|
| | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst | Grnd Roll Ft | Total Ft To Clear 50 Ft Obst |
| S. L. | 545 | 1290 | 565 | 1320 | 585 | 1350 | 605 | 1380 | 625 | 1415 |
| 1000 | 565 | 1320 | 585 | 1350 | 605 | 1385 | 625 | 1420 | 650 | 1450 |
| 2000 | 585 | 1355 | 610 | 1385 | 630 | 1420 | 650 | 1455 | 670 | 1490 |
| 3000 | 610 | 1385 | 630 | 1425 | 655 | 1460 | 675 | 1495 | 695 | 1530 |
| 4000 | 630 | 1425 | 655 | 1460 | 675 | 1495 | 700 | 1535 | 725 | 1570 |
| 5000 | 655 | 1460 | 680 | 1500 | 705 | 1535 | 725 | 1575 | 750 | 1615 |
| 6000 | 680 | 1500 | 705 | 1540 | 730 | 1580 | 755 | 1620 | 780 | 1660 |
| 7000 | 705 | 1545 | 730 | 1585 | 760 | 1625 | 785 | 1665 | 810 | 1705 |
| 8000 | 735 | 1585 | 760 | 1630 | 790 | 1670 | 815 | 1715 | 840 | 1755 |

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 8 KIAS and allow for 35% longer distances.

Figure 18
Short Field Landing Distance

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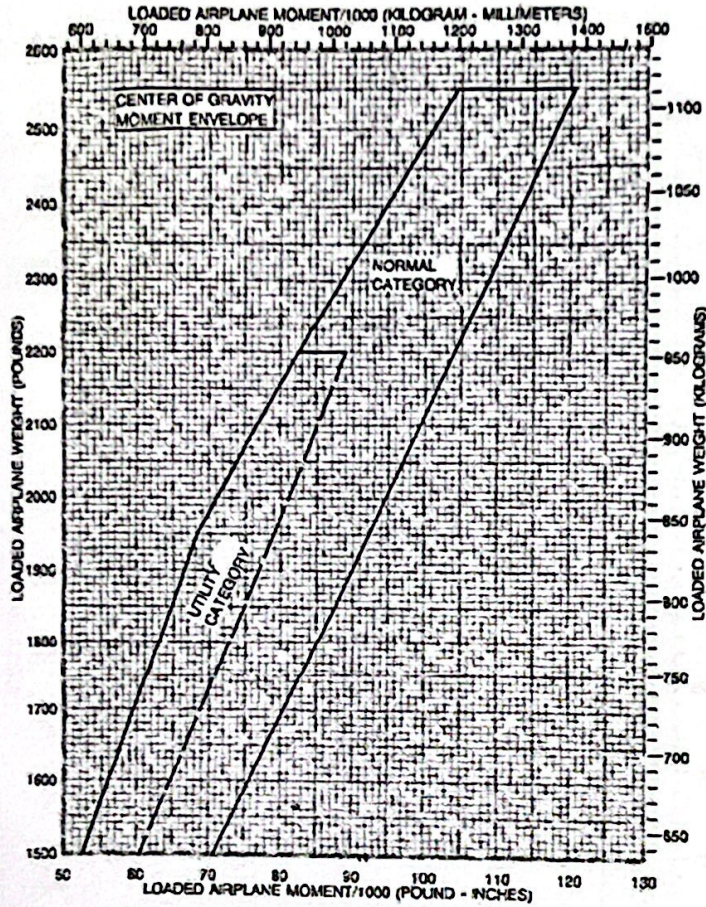


Figure 19
Center of Gravity Moment Envelope

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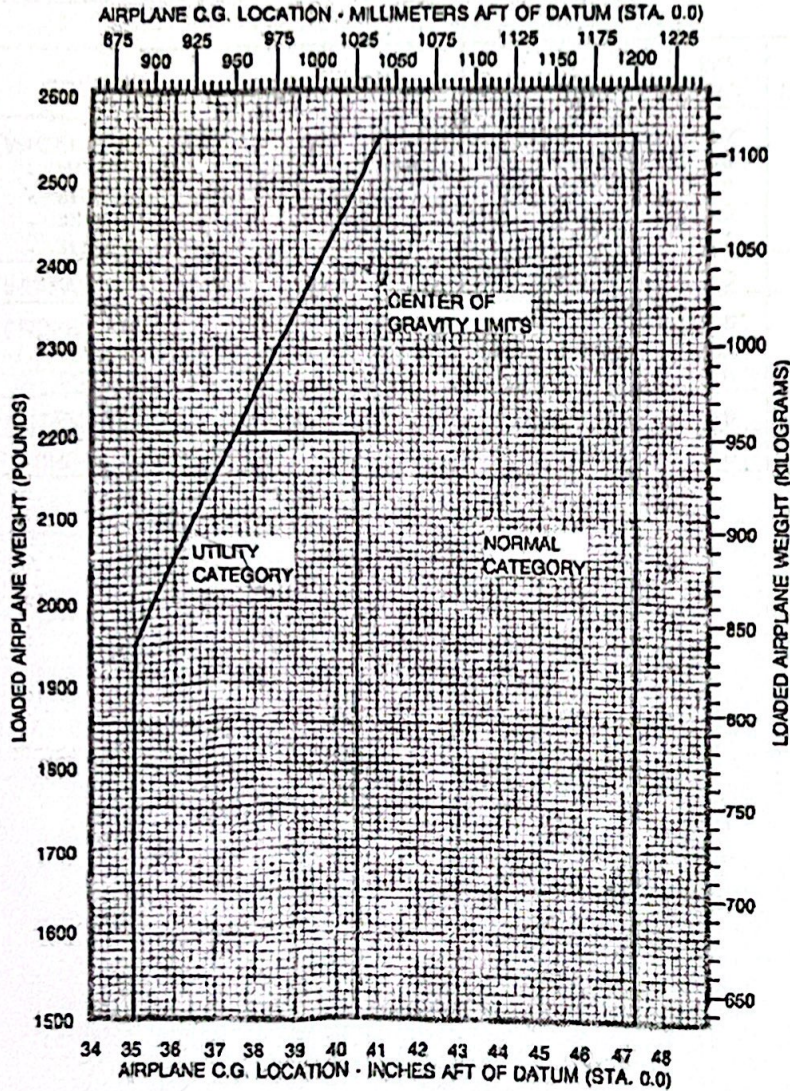


Figure 20
Center of Gravity Limits

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