

N5288J

1976 Cessna 421C

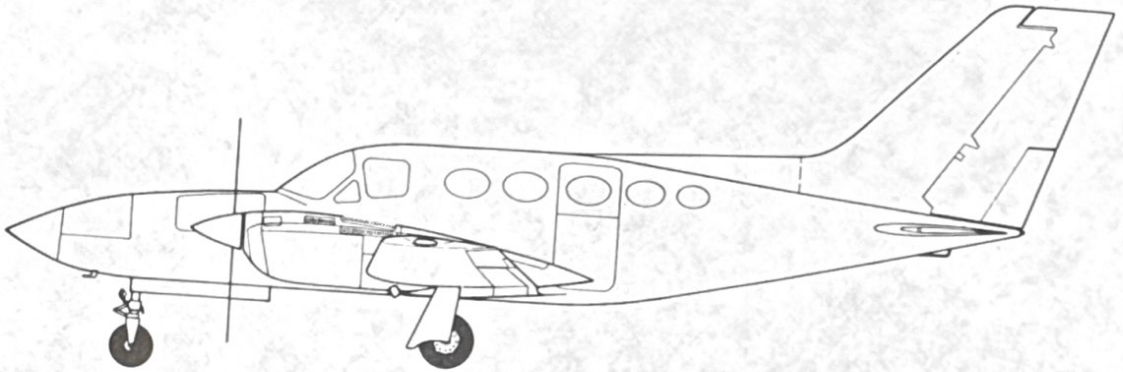
Performance Data

MSN: 421C-0158



Prepared by the worldwide aviation specialists at RidgeAire, Inc.

PILOT'S OPERATING HANDBOOK



CESSNA AIRCRAFT COMPANY

1976 MODEL 421C

Serial Number 421C-0158

Registration Number N5288J

IT IS RECOMMENDED THIS DOCUMENT BE
CARRIED IN THE AIRPLANE AT ALL TIMES

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED
TO BE FURNISHED TO THE PILOT BY CAR PART 3.

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WICHITA, KANSAS, USA

CESSNA AIRCRAFT COMPANY

Aircraft Division

Wichita, Kansas

1 NOVEMBER 1975

REVISION 5 - 1 MARCH 1985

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INTRODUCTION

Section 5 of the Pilot's Operating Handbook contains all the performance information required to operate the airplane safely and to help you plan your flights in detail with reasonable accuracy. Safe and precise operation of the airplane requires the pilot to be thoroughly familiar with and understand the data and calculations of this section.

The data on these graphical and tabular charts have been compiled from actual flight tests, with the airplane and engines in good condition, using average pilot techniques. Note that the cruise performance data makes no allowance for wind and/or navigational errors. Allowances for start, taxi, takeoff, climb, descent and 45 minutes reserve are provided in the range profile chart.

To determine pressure altitude at origin and destination airports, add 100 feet to field elevation for each .1 inch Hg. below 29.92 or subtract 100 feet from field elevation for each .1 inch Hg. above 29.92.

INTRODUCTION TO TABULATED PERFORMANCE

The performance tables are presented in increments of temperature, altitude and any other variables involved. Performance for a given set of conditions can be approximated as follows:

- (1) Takeoff, Accelerate Stop, Accelerate Go, Landing - Enter tables at the next higher increment of weight, altitude and temperature.
- (2) Cruise - Enter tables at next lower increment of temperature and altitude.

To obtain exact performance values from the tables, it is necessary to interpolate between the increment values. The following is an example of approximation and interpolation, using an excerpt from the Normal Takeoff Distance Chart.

EXAMPLE

Given:

Weight 7100 Pounds
 Temperature (16°C) 61°F
 Pressure Altitude 2400 Feet
 Headwind 19 Knots

Find:

Takeoff Speed _____ KIAS
 Ground Roll _____ Feet
 Total Distance to Clear 50-Foot Obstacle _____ Feet

| Weight Pounds | Takeoff and Climb Speed KIAS | Pressure Altitude Feet | 10°C (50°F) | | 20°C (68°F) | |
|---------------|------------------------------|------------------------|--------------------|--------------------------------------|--------------------|--------------------------------------|
| | | | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet |
| 7450 | 100 | 2000 | 1930 | 2490 | 2130 | 2810 |
| | | 3000 | 2050 | 2650 | 2270 | 3000 |
| 6800 | 96 | 2000 | 1550 | 1970 | 1700 | 2190 |
| | | 3000 | 1650 | 2090 | 1810 | 2340 |

Approximation Method

Extract from the chart the next increment of weight, altitude and temperature which is more conservative than the actual conditions [i.e.: 7450 pounds, 3000 feet and 20°C (68°F)].

Takeoff and Climb Speed 100 KIAS
 Ground Roll 2270 Feet
 Total Distance to Clear 50-Foot Obstacle 3000 Feet

Interpolation Method

If the approximation method yields a value larger than can be tolerated, a more exact value should be determined using the interpolation method.

7100
- 6800

300 / 280
650

7450
- 7000

450 / 350

*The example weight (7100 pounds) is 6800 pounds plus $\frac{300}{650}$ or .46 times the difference between 6800 pounds and 7450 pounds [i.e.: 6800-pound value + .46 (7450-pound value - 6800-pound value)].

The example pressure altitude (2400 feet) is 2000 feet plus $\frac{400}{1000}$ or .4 times the difference between 2000 feet and 3000 feet [i.e.: 2000-foot value + .4 (3000-foot value - 2000-foot value)].

The example temperature of 16°C (61°F) is 10°C plus $\frac{6}{10}$ or .6 times the difference between 10°C and 20°C [i.e.: 10°C value + .6 (20°C value - 10°C value)].

Interpolating Values for Normal Takeoff Distance:

Takeoff and Climb Speed = 6800-pound value + [.46 (7450-pound value - 6800-pound value)]

= 96 KIAS + [.46 (100 KIAS - 96 KIAS)]

= 96 KIAS + [1.8 KIAS]

= 98 KIAS

100
- 96

4 x .46

Ground Roll (7 interpolations required)

Altitude interpolation at 10°C (50°F) and 7450 pounds = 2000-foot value + [.4 (3000-foot value - 2000-foot value)]

= 1930 feet + [.4 (2050 feet - 1930 feet)]

= 1930 feet + [48 feet]

= 1978 feet

Altitude interpolation at 20°C (68°F) and 7450 pounds = 2000-foot value + [.4 (3000-foot value - 2000-foot value)]

= 2130 feet + [.4 (2270 feet - 2130 feet)]

= 2130 feet + [56 feet]

= 2186 feet

Altitude interpolation at 10°C (50°F) and 6800 pounds = 2000-foot value + [.4 (3000-foot value - 2000-foot value)]

= 1550 feet + [.4 (1650 feet - 1550 feet)]

= 1550 feet + [40 feet]

= 1590 feet

SECTION 5
PERFORMANCE

Cessna
MODEL **421C**

Altitude interpolation at 20°C (68°F) and 6800 pounds

$$= 2000\text{-foot value} + [.4 (3000\text{-foot value} - 2000\text{-foot value})]$$

$$= 1700 \text{ feet} + [.4 (1810 \text{ feet} - 1700 \text{ feet})]$$

$$= 1700 \text{ feet} + [44 \text{ feet}]$$

$$= \underline{1744 \text{ feet}}$$

The Normal Takeoff Distance chart, with altitude interpolation, looks as follows:

| Weight Pounds | Takeoff and Climb Speed KIAS | Pressure Altitude Feet | 10°C (50°F) | | 20°C (68°F) | |
|---------------|------------------------------|------------------------|--------------------|--------------------------------------|--------------------|--------------------------------------|
| | | | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet |
| 7450 | 100 | 2400 | 1978 | ---- | 2186 | ---- |
| 6800 | 96 | 2400 | 1590 | ---- | 1744 | ---- |

Weight interpolation at 10°C (50°F) and 2400 feet

$$= 6800\text{-pound value} + [.46 (7450\text{-pound value} - 6800\text{-pound value})]$$

$$= 1590 \text{ feet} + [.46 (1978 \text{ feet} - 1590 \text{ feet})]$$

$$= 1590 \text{ feet} + [178 \text{ feet}]$$

$$= \underline{1768 \text{ feet}}$$

Weight interpolation at 20°C (68°F) and 2400 feet

$$= 6800\text{-pound value} + [.46 (7450\text{-pound value} - 6800\text{-pound value})]$$

$$= 1744 \text{ feet} + [.46 (2186 \text{ feet} - 1744 \text{ feet})]$$

$$= 1744 \text{ feet} + [203 \text{ feet}]$$

$$= \underline{1947 \text{ feet}}$$

The Normal Takeoff Distance chart, with altitude and weight interpolation, looks as follows:

| Weight Pounds | Takeoff and Climb Speed KIAS | Pressure Altitude Feet | 10°C (50°F) | | 20°C (68°F) | |
|---------------|------------------------------|------------------------|--------------------|--------------------------------------|--------------------|--------------------------------------|
| | | | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet | Ground Roll - Feet | Total Distance to Clear 50-Ft - Feet |
| 7100 | 98 | 2400 | 1768 | ---- | 1947 | ---- |

CRUISE CONDITIONS

| | |
|---------------------------|---|
| Distance | 600 Nautical Miles |
| Cruise Altitude | 17,500 Feet |
| Temperature | -10°C (14°F) |
| Wind | 15-Knot Tailwind |
| Power | Maximum Recommended Cruise Power at Recommended Lean Mixture |

LANDING AIRPORT CONDITIONS

| | |
|-----------------------------------|-----------------------|
| Field Length | 3500 Feet (Runway 19) |
| Temperature | 7°C (45°F) |
| Field Pressure Altitude | 1700 Feet |
| Wind | 210° at 17 Knots |
| Landing Weight | To be Calculated |
| Obstacles | 50-Foot Trees |

SAMPLE CALCULATIONS

Wind Component Chart (Figure 5-9)

- (1) The angle between the runway and the prevailing wind is 40°.
- (2) Enter Figure 5-9 on the 40° wind line and proceed out to the intersection with the 25-knot arc.
- (3) Read horizontally left from this intersection; the headwind component is 19 knots.

Normal Takeoff Distance (Figure 5-10)

- (1) Enter Figure 5-10 at 7450 pounds weight; the takeoff and climb speed is 100 KIAS.
- (2) Proceed horizontally right from 3000-foot pressure altitude to the vertical columns for 20°C (68°F). The takeoff ground run is 2270 feet and the total distance required to clear a 50-foot obstacle is 3000 feet without wind correction. With a 19-knot headwind component, the corrected takeoff ground run is 1968 feet and the corrected total distance required is 2601 feet.

$$\frac{19 \text{ Knots Headwind}}{10 \text{ Knots Headwind}} (7\%) = 13.3\%$$

Corrected Takeoff Ground Run = 2270 feet - [13.3% (2270 feet)]
 = 2270 feet - [302 feet]
 = 1968 feet

Corrected Total Distance Required = 3000 feet - [13.3% (3000 feet)]
 = 3000 feet - [399 feet]
 = 2601 feet

Handwritten calculation:

$$\begin{array}{r} 2270 \\ \times 13.3 \\ \hline 3011.9 \end{array}$$

PA

over 50'

Accelerate Stop Distance (Figure 5-11)

- (1) Enter Figure 5-11 at 7450 pounds weight; engine failure speed is 100 KIAS.

- (2) Proceed horizontally right from 3000-foot pressure altitude to the vertical columns for 20°C (68°F). The distance required to accelerate to 100 KIAS and stop is 4350 feet without wind correction. With a 19-knot headwind component, the accelerate stop distance can be reduced by:

$$\frac{19 \text{ Knots Headwind}}{4 \text{ Knots Headwind}} (3\%) = 14.25\%$$

$$\begin{aligned} \text{Corrected Accelerate} &= 4350 \text{ feet} - [14.25\% (4350 \text{ feet})] \\ \text{Stop Distance} &= 4350 \text{ feet} - [620 \text{ feet}] \\ &= 3730 \text{ feet} \end{aligned}$$

Accelerate Go Distance (Figure 5-12)

- (1) Enter Figure 5-12 at 7450 pounds weight; engine failure speed is 100 KIAS.
 (2) Proceed horizontally right from 3000-foot pressure altitude to the vertical columns for 20°C (68°F). The distance required to clear a 50-foot obstacle, after losing an engine at 100 KIAS, is 13,540 feet without wind correction. With a 19-knot headwind component, the distance can be reduced by:

$$\frac{19 \text{ Knots Headwind}}{10 \text{ Knots Headwind}} (6\%) = 11.4\%$$

$$\begin{aligned} \text{Corrected Accelerate} &= 13,540 \text{ feet} - [11.4\% (13,540 \text{ feet})] \\ \text{Go Distance} &= 13,540 \text{ feet} - [1544 \text{ feet}] \\ &= 11,996 \text{ feet} \end{aligned}$$

13,540 x 11.4%

*~~17753~~
154336 OR - 1544*

NOTE

- The distance required to accelerate go using the approximation method is so great, in view of the 6000-foot runway available, that a more exact value should be obtained using the interpolation method.
- The interpolation method gives an accelerate go distance of 6025 feet without wind or 5338 feet with 19 knots of headwind.

Rate-Of-Climb — Maximum Climb (Figure 5-13)

- (1) Enter Figure 5-13 at 16°C (61°F).
 (2) Proceed vertically up to the 2400-foot pressure altitude line.
 (3) Proceed horizontally right to the reference line. Follow the slope of the adjacent rate-of-climb lines until intersecting the vertical 7100-pound line.
 (4) Proceed horizontally right to obtain rate-of-climb. (1880 Feet per minute)
 (5) Enter the climb speed data to determine the climb speed corrected for 7100 pounds and 2400 feet. (108 KIAS)

Rate-Of-Climb — Cruise Climb (Figure 5-14)

- (1) Enter Figure 5-14 at 16°C (61°F).
- (2) Proceed vertically up to the 2400-foot pressure altitude line.
- (3) Proceed horizontally right to the reference line. Follow the slope of the adjacent rate-of-climb lines until intersecting the vertical 7100-pound line.
- (4) Proceed horizontally right to obtain rate-of-climb. (1210 Feet per minute)
- (5) Climb speed is 120 KIAS for all conditions.

Rate-Of-Climb — One Engine Inoperative (Figure 5-15)

- (1) Enter Figure 5-15 at 16°C (61°F).
- (2) Proceed vertically up to the 2400-foot pressure altitude line.
- (3) Proceed horizontally right to the reference line. Follow the slope of the adjacent rate-of-climb lines until intersecting the vertical 7100-pound line.
- (4) Proceed horizontally right to obtain rate-of-climb. (320 Feet per minute)
- (5) Enter the climb speed data to determine the climb speed corrected for 7100 pounds and 2400 feet. (109 KIAS)

Time, Fuel And Distance To Climb — Cruise Climb (Figure 5-19)

Time, fuel and distance to climb are determined by finding the difference between the airport and the cruise conditions; thus, two calculations are required, one for the airport condition and the second for the cruise condition.

Airport Condition:

- (1) Enter Figure 5-19 at 16°C (61°F).
- (2) Proceed vertically up to 2400-foot pressure altitude line.
- (3) Proceed horizontally right to the 7100-pound line.
- (4) Proceed vertically down to obtain time to climb (2.2 minutes), fuel to climb (11 pounds) and distance to climb (5 nautical miles).

Cruise Condition:

- (5) Enter Figure 5-19 at -10°C (14°F).
- (6) Proceed vertically up to 17,500-foot pressure altitude line.
- (7) Proceed horizontally right to the 7100-pound line.
- (8) Proceed vertically down to obtain time to climb (17.4 minutes), fuel to climb (81 pounds) and distance to climb (40 nautical miles).

Final Calculations:

$$\begin{aligned} \text{Time to Climb} &= \text{Cruise time to climb} - \text{Airport time to climb} \\ &= 17.4 \text{ minutes} - 2.2 \text{ minutes} \\ &= \underline{15.2 \text{ minutes}} \end{aligned}$$

Fuel to Climb = Cruise fuel to climb - Airport fuel to climb

= 81 pounds - 11 Pounds

= 70 pounds (add 46 pounds for start, taxi and runup) (116 pounds total)

Distance to Climb = Cruise distance to climb - Airport distance to climb

= 40 nautical miles - 5 nautical miles

= 35 nautical miles

Adjusted for wind (use 60% of the wind at altitude for climb wind),

= 35 nautical miles + wind contribution

= 35 + [$\frac{15.2 \text{ minutes}}{60 \text{ minutes}}$ (.6 x 15 knots)]

= 35 nautical miles + 2.3 nautical miles

= 37.3 nautical miles

Time, Fuel And Distance To Descend (Figure 5-24)

Time, fuel and distance to descend are determined by finding the difference between the cruise and the landing airport conditions; thus two calculations are required, one for the cruise condition and the second for the landing airport condition.

Cruise Condition:

- (1) Enter Figure 5-24 at the cruise altitude of 17,500 feet.
- (2) Proceed horizontally right to the guideline.
- (3) Proceed vertically down to obtain time to descend (16.3 minutes), fuel to descend (52 pounds) and distance to descend (55.5 nautical miles).

Landing Airport Condition:

- (4) Enter Figure 5-24 at the airport altitude of 1700 feet.
- (5) Proceed horizontally right to the guideline.
- (6) Proceed vertically down to obtain time to descend (2.1 minutes), fuel to descend (6 pounds) and distance to descend (6.5 nautical miles).

Final Calculations:

Time to Descend = Cruise time to descend - Airport time to descend

= 16.3 minutes - 2.1 minutes

= 14.2 minutes

| | |
|---------------------|---|
| Fuel to Descend | = Cruise fuel to descend - Airport fuel to descend |
| | = 52 pounds - 6 pounds |
| | = <u>46 pounds</u> |
| Distance to Descend | = Cruise distance to descend - Airport distance to descend. |
| | = 55.5 nautical miles - 6.5 nautical miles |
| | = 49.0 nautical miles |
| | Adjusted for wind (use 40% of the wind at altitude for descent wind), |
| | = 49.0 ± wind contribution |
| | = 49.0 + [$\frac{14.2 \text{ minutes}}{60 \text{ minutes}}$ (.4 x 15 knots)] |
| | = 49.0 nautical miles + 1.4 nautical miles |
| | = <u>50.4 nautical miles</u> |

Cruise Performance With Recommended Lean Mixture (Figure 5-20)

Maximum recommended cruise may be obtained with 1900 RPM and 32.5 Inches Hg. manifold pressure.

The approximation method for extracting data from the cruise tables is to select the next lower temperature and altitude values, which are generally conservative with respect to fuel economy.

- (1) Enter the 15,000-foot data at 1900 RPM and 32.5 Inches Hg. manifold pressure.
- (2) Use -15°C (5°F) data for a power of 73.5%, airspeed of 214 KTAS and a total fuel flow of 257 pounds per hour.
- (3) Correcting for a weight of 7100 pounds, the airspeed increases to:

$$214 \text{ KTAS} + \frac{(7450 \text{ pounds} - 7100 \text{ pounds})}{1000 \text{ pounds}} (6 \text{ KTAS}) =$$

$$214 \text{ KTAS} + 2.1 \text{ KTAS} = \underline{216 \text{ KTAS}}$$

Using the interpolation method, interpolating altitude, temperature and weight, the actual performance is 71.2% power, 221 KTAS and total fuel flow of 250 pounds per hour.

In the above calculations, for convenience, the weight was assumed to be equal to the takeoff weight of 7100 pounds. More realistic data can be determined if the average cruise weight is used. This average cruise weight is determined as follows:

$$\text{Cruise Fuel} = \frac{\text{Total distance} - \text{climb distance} - \text{descent distance}}{\frac{\text{True airspeed} + \text{wind correction}}{2}} \times [\text{Total fuel flow per hour}]$$

$$= \frac{600 \text{ Nautical Miles} - 37.3 \text{ Nautical Miles} - 50.4 \text{ Nautical Miles}}{221 \text{ KTAS} + 15 \text{ Knot Tailwind}} \times [250 \text{ pounds per hour}]$$

$$= \frac{512.3 \text{ Nautical miles}}{236} \times 250 \text{ pounds per hour}$$

$$= 2.17 \text{ hours} \times 250 \text{ pounds per hour}$$

$$= \underline{543 \text{ pounds}}$$

$$\text{Average Cruise Weight} = \text{Takeoff weight} - \text{start, taxi and climb fuel} - \frac{\text{Cruise fuel}}{2}$$

$$= 7100 \text{ pounds} - 116 \text{ pounds} - \frac{543 \text{ pounds}}{2}$$

$$= \underline{6713 \text{ pounds}}$$

$$\text{Average Cruise Speed} = \text{True airspeed from Figure 5-20} + \text{weight correction}$$

$$= 221 \text{ KTAS} + 6 \left(\frac{387}{1000} \right)$$

$$= \underline{223 \text{ KTAS}}$$

$$\text{Average Ground Speed} = 223 \text{ KTAS} + \text{tailwind}$$

$$= 223 \text{ KTAS} + 15 \text{ knots}$$

$$= \underline{238 \text{ knots}}$$

$$\text{Distance During Cruise} = \text{Total distance} - \text{Climb distance} - \text{Descent distance}$$

$$= 600 - 37.3 - 50.4$$

$$= \underline{512.3 \text{ Nautical Miles}}$$

$$\text{Time During Cruise} = \frac{\text{Cruise distance}}{\text{ground speed}}$$

$$= \frac{512.3}{238}$$

$$= \underline{2.15 \text{ hours}}$$

Normal Landing Distance (Figure 5-25)

$$\text{Landing Weight} = \text{Takeoff weight} - \text{climb fuel} - \text{cruise fuel} - \text{descent fuel}$$

$$= 7100 \text{ pounds} - 116 \text{ pounds} - 543 \text{ pounds} - 46 \text{ pounds}$$

$$= \underline{6395 \text{ pounds}}$$

Wind = 210° at 17 knots. Determine headwind component from Figure 5-9. (16 knots headwind)

Enter Figure 5-25 at 6600 pounds; the approach speed is 96 KIAS. Proceed horizontally right from 2000-foot pressure altitude to the vertical column for 10°C (50°F). The landing distance ground roll is 630 feet and the total distance required to clear a 50-foot obstacle is 2210 feet without wind correction. With a 16-knot headwind component, the corrected ground roll distance is 554 feet and the corrected total distance required is 1945 feet.

$$\frac{16 \text{ Knots Headwind}}{4 \text{ Knots Headwind}} (3\%) = 12\%$$

Corrected Landing Ground Roll = 630 feet - [12% (630)]
= 630 feet - 76 feet
= 554 feet

Corrected Total Distance Required = 2210 - [12% (2210)]
= 2210 feet - 265 feet
= 1945 feet

Rate-Of-Climb — Balked Landing Climb (Figure 5-16)

- (1) Enter Figure 5-16 at 7°C (45°F).
- (2) Proceed vertically up to the 1700-foot pressure altitude line.
- (3) Proceed horizontally right to the weight reference line. Follow the guidelines up and to the right until intersecting the vertical 6395-pound weight line.
- (4) Proceed horizontally right to determine the rate-of-climb. (1510 Feet per minute)

Total Fuel Required = Start, taxi and climb fuel + cruise fuel + descent fuel
= 116 pounds + 543 pounds + 46 pounds = 705 pounds (Without Holding Fuel)
or 705 pounds + 125 pounds = 830 pounds (With 45 Minutes Holding Fuel)

Holding Time (Figure 5-23)

To determine holding time, the fuel available for holding must be determined.

Fuel Available for Holding = Initial fuel - [start, taxi and climb fuel + cruise fuel + descent fuel]
= 1236 pounds - [116 pounds + 543 pounds + 46 pounds]
= 531 pounds

- (1) Enter Figure 5-23 at 531 pounds of fuel available.
- (2) Proceed vertically up to the intersection with the guideline.
- (3) Proceed horizontally left to obtain holding time available. (3.2 hours)

AIRSPEED CALIBRATION NORMAL STATIC SOURCE

NOTE:

1. Indicated airspeed assumes zero instrument error.
2. The following calibrations are not valid in the prestall buffet.
3. The following calibrations are valid for the pilot's and copilot's airspeed indicators when the standard or optional dual static system is installed.

| Gear Up Flaps 0° | | Gear Down Flaps 15° | | Gear Down Flaps 45° | |
|---------------------|------|------------------------|------|------------------------|-------|
| KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| --- | --- | 70 | 73 | 70 | 72 |
| 80 | 82 | 80 | 82 | 80 | 81 |
| 90 | 91 | 90 | 92 | 90 | 91 |
| 100 | 101 | 100 | 101 | 100 * | 100 * |
| 110 | 110 | 110 | 110 | 110 | 110 |
| 120 | 120 | 120 | 120 | 120 | 119 |
| 140 | 139 | 130 | 129 | 130 | 129 |
| 160 | 159 | 140 | 139 | 140 | 139 |
| 180 | 179 | 150 | 149 | 146 | 145 |
| 200 | 198 | 160 | 159 | --- | --- |
| 220 | 218 | 170 | 169 | --- | --- |
| 240 | 238 | 176 | 175 | --- | --- |

*Recommended Minimum All Engines Approach Speed With 45° Flaps.

Figure 5-1

AIRSPEED CALIBRATION ALTERNATE STATIC SOURCE

NOTE:

1. Indicated airspeed assumes zero instrument error.
2. The following calibrations are not valid in the prestall buffet.
3. The following calibrations are valid for pilot's and copilot's airspeed indicators when the standard static system is installed.
4. An alternate static source is not available for copilot's instruments when optional dual static system is installed.

| Gear Up Flaps 0° | | Gear Down Flaps 15° | | Gear Down Flaps 45° | |
|---------------------|------|------------------------|------|------------------------|-------|
| IAS | KCAS | IAS | KCAS | IAS | KCAS |
| --- | --- | --- | --- | 70 | 75 |
| 80 | 89 | 80 | 85 | 80 | 83 |
| 90 | 98 | 90 | 94 | 90 | 92 |
| 100 | 108 | 100 | 102 | 100 * | 100 * |
| 110 | 117 | 110 | 111 | 110 | 109 |
| 120 | 126 | 120 | 119 | 120 | 117 |
| 140 | 144 | 130 | 128 | 130 | 126 |
| 160 | 163 | 140 | 136 | 140 | 134 |
| 180 | 181 | 150 | 145 | 150 | 143 |
| 200 | 199 | 160 | 153 | --- | --- |
| 220 | 218 | 180 | 170 | --- | --- |
| 240 | 236 | --- | --- | --- | --- |

*Recommended Minimum All Engines Approach Speed With 45° Flaps.

Figure 5-2

ALTIMETER CORRECTION NORMAL STATIC SOURCE

NOTE:

1. Add correction to indicated altimeter reading.
2. The following calibrations are valid for the pilot's and copilot's altimeters when the standard or optional dual static system is installed.

| Altitude | Sea Level | | | 10,000 Feet | | | 20,000 Feet | | |
|----------|-----------|------|------|-------------|------|------|-------------|------|------|
| | Gear | Up | Down | Down | Up | Down | Down | Up | Down |
| Flaps | 0° | 15° | 45° | 0° | 15° | 45° | 0° | 15° | 45° |
| KIAS | Feet | Feet | Feet | Feet | Feet | Feet | Feet | Feet | Feet |
| 80 | 14 | 16 | 6 | 19 | 22 | 9 | 27 | 31 | 12 |
| 90 | 10 | 10 | 7 | 13 | 14 | 10 | 18 | 20 | 14 |
| 100 * | 9 | 9 | 0 | 12 | 12 | 0 | 17 | 17 | 0 |
| 120 | -3 | 0 | -6 | -4 | 0 | -9 | -6 | 0 | -12 |
| 140 | -11 | -8 | -15 | -15 | -10 | -21 | -21 | -14 | -29 |
| 160 | -15 | -18 | --- | -20 | -24 | --- | -27 | -33 | --- |
| 180 | -20 | --- | --- | -27 | --- | --- | -37 | --- | --- |
| 200 | -33 | --- | --- | -45 | --- | --- | -63 | --- | --- |
| 220 | -39 | --- | --- | -53 | --- | --- | -73 | --- | --- |
| 240 | -43 | --- | --- | -58 | --- | --- | -80 | --- | --- |

*Recommended Minimum All Engines Approach Speed With 45° Flaps

ALTITUDE CORRECTION PROCEDURE

$$\left[\begin{array}{c} \text{INDICATED ALTITUDE} \\ \text{TO FLY} \end{array} \right] = \left[\begin{array}{c} \text{DESIRED ALTITUDE} \\ \text{(MSL)} \end{array} \right] - \left[\begin{array}{c} \text{ALTIMETER} \\ \text{CORRECTION} \end{array} \right]$$

Figure 5-3

ALTIMETER CORRECTION ALTERNATE STATIC SOURCE

NOTE:

1. Add correction to indicated altimeter reading.
2. The following calibrations are valid for pilot's and copilot's altimeters when the standard static system is installed.
3. An alternate static source is not available for copilot's instruments when the optional dual static system is installed.

| Altitude | Sea Level | | | 10,000 Feet | | | 20,000 Feet | | |
|----------|-----------|------|------|-------------|------|------|-------------|------|------|
| | Up | Down | Down | Up | Down | Down | Up | Down | Down |
| Flaps | 0° | 15° | 45° | 0° | 15° | 45° | 0° | 15° | 45° |
| KIAS | Feet | Feet | Feet | Feet | Feet | Feet | Feet | Feet | Feet |
| 80 | 64 | 36 | 24 | 87 | 48 | 32 | 120 | 67 | 44 |
| 90 | 68 | 28 | 16 | 91 | 38 | 22 | 127 | 53 | 30 |
| 100 * | 68 | 18 | 5 | 92 | 24 | 6 | 128 | 34 | 8 |
| 120 | 63 | -11 | -30 | 85 | -15 | -41 | 122 | -20 | -57 |
| 140 | 51 | -48 | -76 | 69 | -65 | -103 | 95 | -90 | -143 |
| 160 | 36 | -102 | ---- | 49 | -138 | ---- | 68 | -191 | ---- |
| 180 | 12 | -174 | ---- | 16 | -235 | ---- | 22 | -326 | ---- |
| 200 | -13 | ---- | ---- | -18 | ---- | ---- | -24 | ---- | ---- |
| 220 | -51 | ---- | ---- | -70 | ---- | ---- | -96 | ---- | ---- |
| 240 | -90 | ---- | ---- | -123 | ---- | ---- | -170 | ---- | ---- |

*Recommended Minimum All Engines Approach Speed With 45° Flaps

ALTITUDE CORRECTION PROCEDURE

$$\left[\begin{array}{c} \text{INDICATED ALTITUDE} \\ \text{TO FLY} \end{array} \right] = \left[\begin{array}{c} \text{DESIRED ALTITUDE} \\ \text{(MSL)} \end{array} \right] - \left[\begin{array}{c} \text{ALTIMETER} \\ \text{CORRECTION} \end{array} \right]$$

Figure 5-4

TEMPERATURE RISE DUE TO RAM RECOVERY



NOTE:
1. Subtract temperature rise from indicated outside air temperature to obtain true outside air temperature

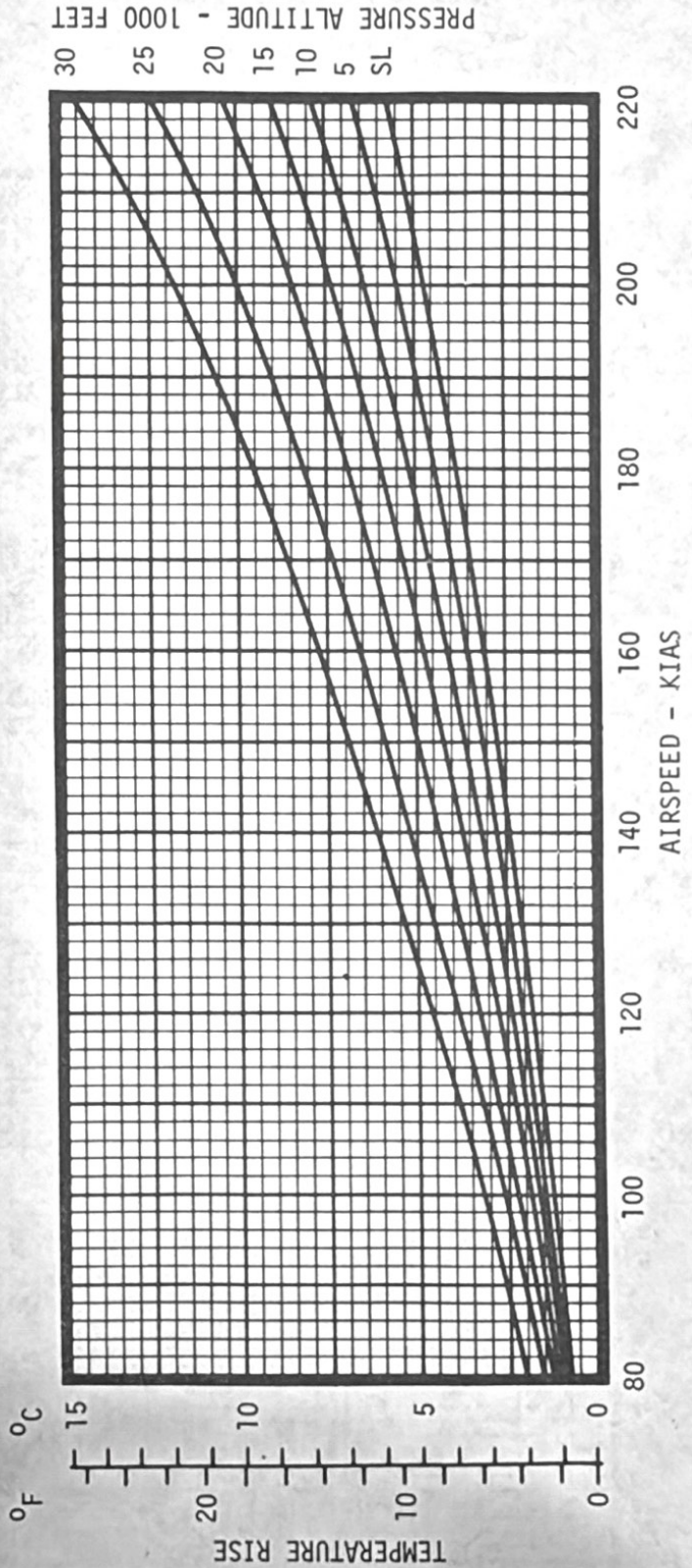
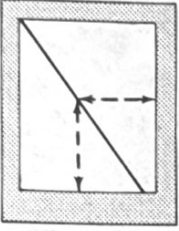


Figure 5-5



TEMPERATURE CONVERSION FROM FAHRENHEIT TO CELSIUS

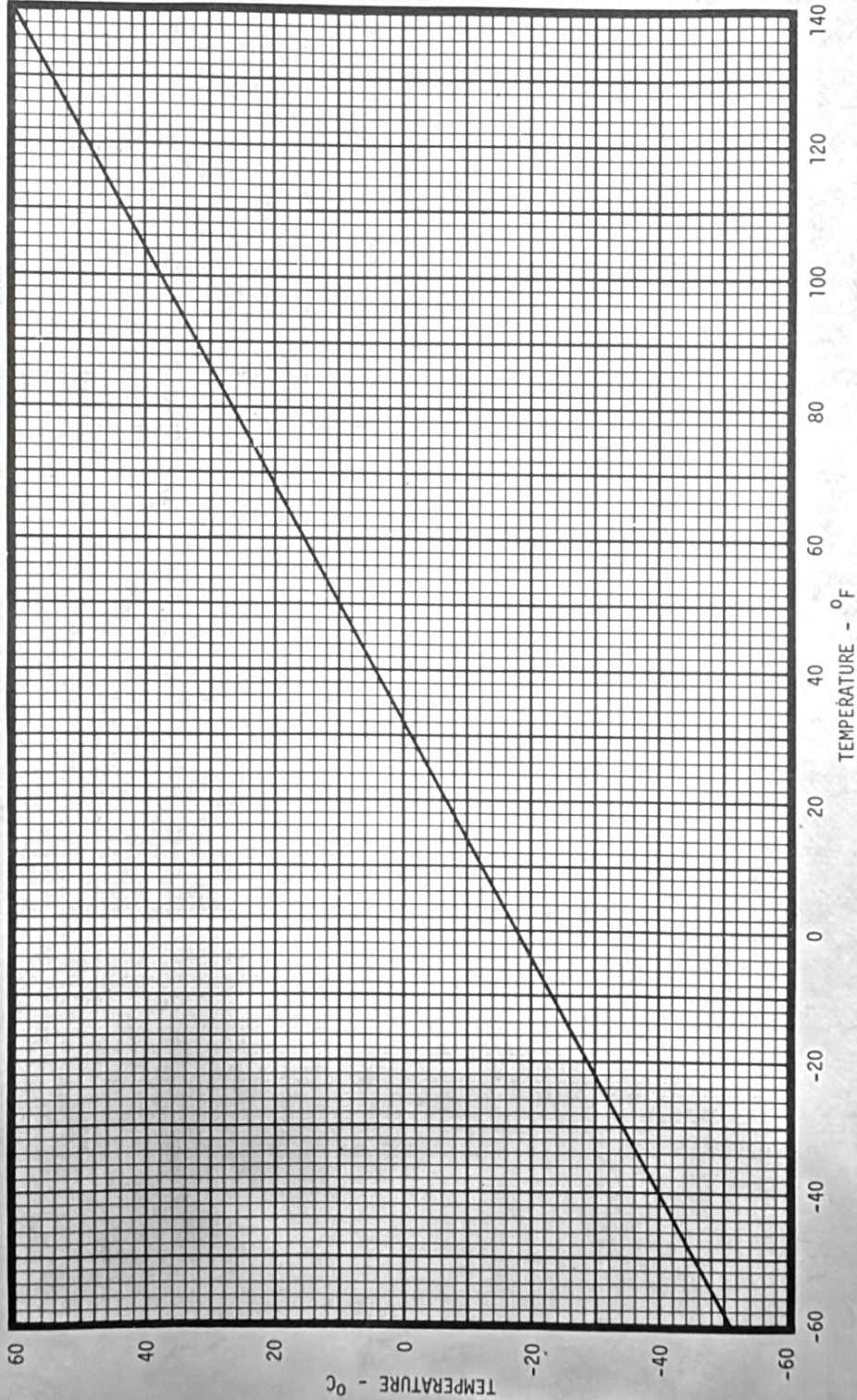


Figure 5-6

PRESSURE CONVERSION INCHES OF MERCURY TO MILLIBARS

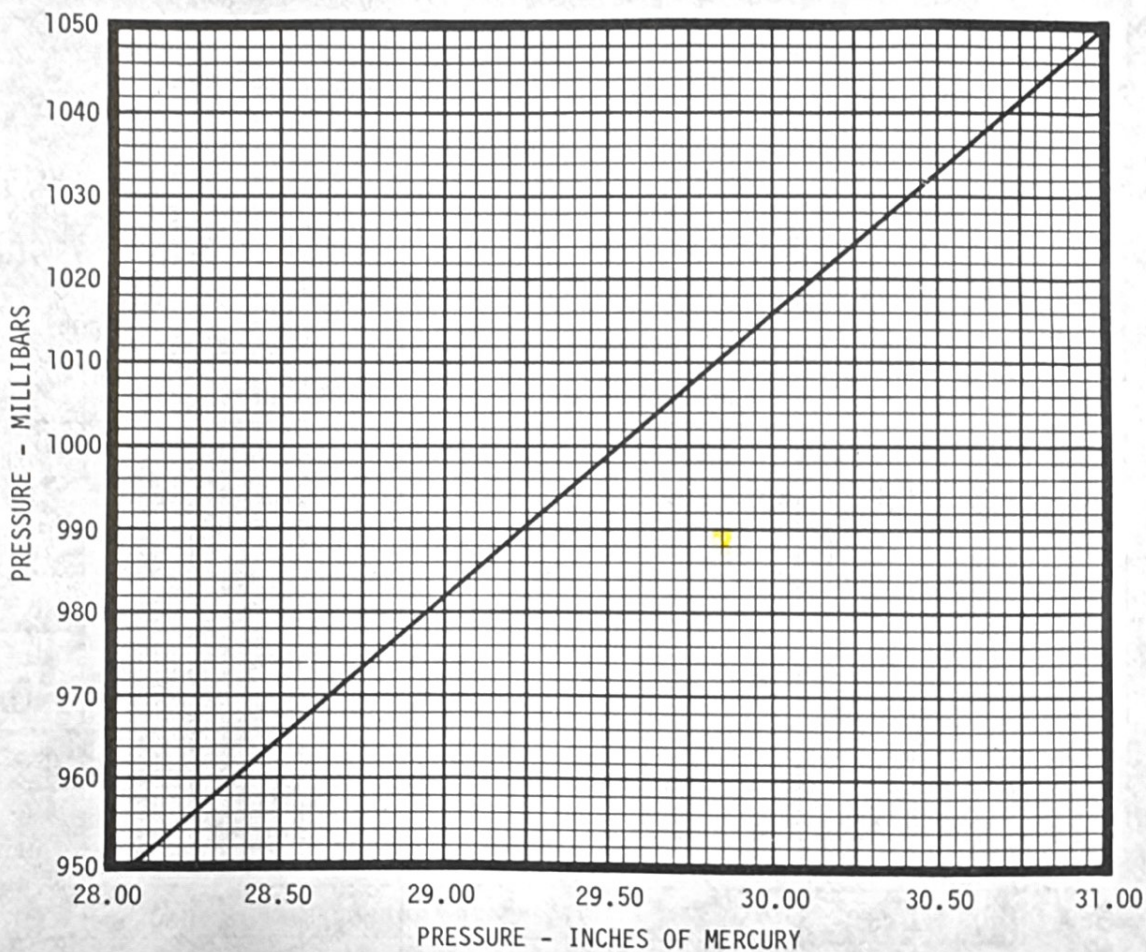
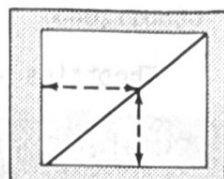


Figure 5-7

STALL SPEEDS

NOTE:

1. Maximum altitude lost during a conventional stall is approximately 800 feet.
2. Maximum nose down pitch attitude and altitude loss during recovery from an engine inoperative stall is approximately 25° below the horizon and 550 feet, respectively.

| WEIGHT Pounds | Configuration | | ANGLE OF BANK | | | | | | | |
|------------------|---------------|------|---------------|------|------|------|------|------|------|------|
| | | | 0° | | 20° | | 40° | | 60° | |
| | | | Flaps | Gear | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| 7450 | 0° | Up | 86 | 83 | 89 | 85 | 98 | 94 | 122 | 117 |
| | 15° | Down | 82 | 80 | 85 | 82 | 95 | 91 | 118 | 113 |
| | 45° | Down | 77 | 74 | 80 | 76 | 89 | 85 | 110 | 105 |
| 6800 | 0° | Up | 82 | 79 | 85 | 81 | 94 | 90 | 117 | 112 |
| | 15° | Down | 78 | 76 | 81 | 78 | 90 | 87 | 113 | 107 |
| | 45° | Down | 74 | 71 | 76 | 73 | 85 | 81 | 105 | 100 |
| 6200 | 0° | Up | 78 | 75 | 81 | 78 | 90 | 86 | 112 | 107 |
| | 15° | Down | 75 | 73 | 77 | 75 | 86 | 83 | 107 | 103 |
| | 45° | Down | 71 | 68 | 73 | 70 | 81 | 77 | 100 | 95 |
| 5600 | 0° | Up | 74 | 72 | 77 | 74 | 85 | 82 | 106 | 101 |
| | 15° | Down | 71 | 69 | 73 | 71 | 81 | 79 | 102 | 98 |
| | 45° | Down | 67 | 64 | 69 | 66 | 77 | 73 | 95 | 91 |

Figure 5-8

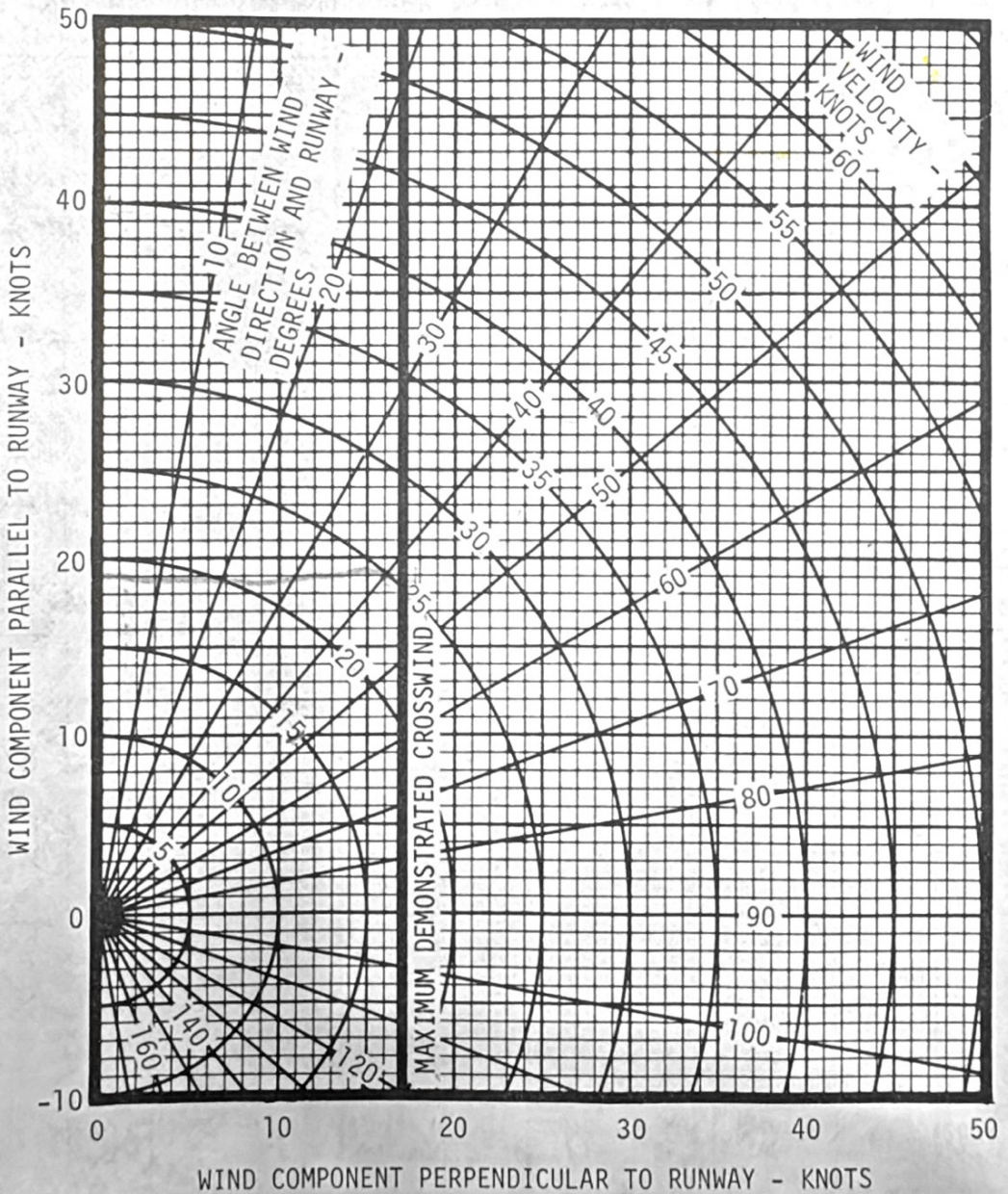
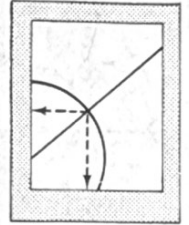
U₅₀ - stall speed in LAMP config

$$77 \times 1.3 = 100$$

WIND COMPONENT

NOTE

Maximum Demonstrated Crosswind Velocity is 17 Knots
(not a limitation).



55847021

Figure 5-9

NORMAL TAKEOFF DISTANCE

CONDITIONS:

1. 2235 RPM and 39.0 Inches Hg. Manifold Pressure Before Brake Release.
2. Mixtures - CHECK Fuel Flows In the White Arc.
3. Wing Flaps - UP.
4. Cowl Flaps - OPEN (If Installed).
5. Level, Hard Surface, Dry Runway.

NOTES:

1. If full power is applied without brakes set, distances apply from point where full power is applied.
2. Decrease distance 7% for each 10 knots headwind.
3. Increase distance 4% for each 2 knots tailwind.

| WEIGHT-POUNDS | TAKEOFF TO 50-FOOT OBSTACLE SPEED-KIAS | PRESSURE ALTITUDE- FEET | -20°C (-4°F) | | -10°C (14°F) | | 0°C (32°F) | | 10°C (50°F) | |
|---------------|--|-------------------------|--------------------|---------------------------------|--------------------|---------------------------------|--------------------|---------------------------------|--------------------|---------------------------------|
| | | | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET |
| 7450 | 100 | Sea Level | 1280 | 1610 | 1410 | 1780 | 1550 | 1980 | 1710 | 2200 |
| | | 1000 | 1360 | 1710 | 1500 | 1890 | 1650 | 2100 | 1810 | 2340 |
| | | 2000 | 1450 | 1810 | 1590 | 2000 | 1750 | 2220 | 1930 | 2490 |
| | | 3000 | 1540 | 1920 | 1690 | 2120 | 1860 | 2360 | 2050 | 2650 |
| | | 4000 | 1630 | 2030 | 1800 | 2260 | 1980 | 2520 | 2190 | 2830 |
| | | 5000 | 1740 | 2160 | 1920 | 2400 | 2110 | 2680 | 2330 | 3020 |
| | | 6000 | 1850 | 2300 | 2040 | 2560 | 2250 | 2860 | 2490 | 3230 |
| | | 7000 | 1970 | 2440 | 2180 | 2720 | 2400 | 3060 | 2650 | 3460 |
| | | 8000 | 2110 | 2610 | 2320 | 2910 | 2570 | 3270 | 2840 | 3720 |
| | | 9000 | 2250 | 2780 | 2480 | 3110 | 2740 | 3510 | 3030 | 4010 |
| | | 10,000 | 2410 | 2970 | 2660 | 3330 | 2930 | 3770 | 3250 | 4330 |
| 6800 | 96 | Sea Level | 1010 | 1280 | 1110 | 1410 | 1220 | 1550 | 1370 | 1750 |
| | | 1000 | 1070 | 1350 | 1180 | 1490 | 1330 | 1670 | 1460 | 1850 |
| | | 2000 | 1140 | 1430 | 1280 | 1610 | 1410 | 1770 | 1550 | 1970 |
| | | 3000 | 1240 | 1540 | 1360 | 1700 | 1500 | 1880 | 1650 | 2090 |
| | | 4000 | 1320 | 1630 | 1450 | 1800 | 1590 | 2000 | 1750 | 2220 |
| | | 5000 | 1400 | 1730 | 1540 | 1910 | 1690 | 2120 | 1870 | 2360 |
| | | 6000 | 1490 | 1840 | 1640 | 2030 | 1800 | 2260 | 1990 | 2520 |
| | | 7000 | 1590 | 1950 | 1750 | 2160 | 1920 | 2400 | 2120 | 2690 |
| | | 8000 | 1700 | 2080 | 1870 | 2300 | 2050 | 2560 | 2270 | 2880 |
| | | 9000 | 1810 | 2210 | 1990 | 2460 | 2190 | 2740 | 2420 | 3080 |
| | | 10,000 | 1930 | 2360 | 2130 | 2620 | 2350 | 2930 | 2590 | 3300 |
| 6200 | 91 | Sea Level | 810 | 1030 | 890 | 1130 | 980 | 1240 | 1070 | 1370 |
| | | 1000 | 860 | 1090 | 950 | 1200 | 1040 | 1320 | 1140 | 1450 |
| | | 2000 | 920 | 1150 | 1010 | 1270 | 1100 | 1390 | 1240 | 1570 |
| | | 3000 | 980 | 1220 | 1070 | 1340 | 1200 | 1500 | 1320 | 1660 |
| | | 4000 | 1040 | 1290 | 1160 | 1450 | 1280 | 1590 | 1400 | 1760 |
| | | 5000 | 1130 | 1390 | 1240 | 1530 | 1360 | 1690 | 1490 | 1870 |
| | | 6000 | 1200 | 1480 | 1320 | 1630 | 1450 | 1800 | 1590 | 1990 |
| | | 7000 | 1280 | 1570 | 1400 | 1730 | 1540 | 1910 | 1690 | 2120 |
| | | 8000 | 1360 | 1670 | 1500 | 1840 | 1640 | 2030 | 1810 | 2260 |
| | | 9000 | 1450 | 1770 | 1600 | 1960 | 1750 | 2170 | 1930 | 2410 |
| | | 10,000 | 1550 | 1890 | 1700 | 2080 | 1870 | 2310 | 2060 | 2570 |
| 5600 | 86 | Sea Level | 640 | 820 | 700 | 900 | 770 | 980 | 840 | 1080 |
| | | 1000 | 680 | 860 | 750 | 950 | 820 | 1040 | 890 | 1140 |
| | | 2000 | 720 | 910 | 790 | 1000 | 870 | 1100 | 950 | 1210 |
| | | 3000 | 770 | 970 | 840 | 1060 | 920 | 1160 | 1010 | 1280 |
| | | 4000 | 820 | 1020 | 900 | 1120 | 980 | 1230 | 1070 | 1360 |
| | | 5000 | 870 | 1080 | 950 | 1190 | 1040 | 1310 | 1170 | 1460 |
| | | 6000 | 930 | 1150 | 1020 | 1260 | 1130 | 1410 | 1240 | 1550 |
| | | 7000 | 990 | 1220 | 1100 | 1360 | 1210 | 1500 | 1320 | 1650 |
| | | 8000 | 1070 | 1310 | 1170 | 1440 | 1290 | 1590 | 1410 | 1750 |
| | | 9000 | 1140 | 1400 | 1250 | 1530 | 1370 | 1690 | 1510 | 1870 |
| | | 10,000 | 1220 | 1480 | 1340 | 1630 | 1470 | 1800 | 1610 | 1990 |

Figure 5-10 (Sheet 1 of 2)

NORMAL TAKEOFF DISTANCE

CONDITIONS:

1. 2235 RPM and 39.0 Inches Hg. Manifold Pressure Before Brake Release.
2. Mixtures - CHECK Fuel Flows In the White Arc.
3. Wing Flaps - UP.
4. Cowl Flaps - OPEN (If Installed) .
5. Level, Hard Surface, Dry Runway.

NOTES:

1. If full power is applied without brakes set, distances apply from point where full power is applied.
2. Decrease distance 7% for each 10 knots headwind.
3. Increase distance 4% for each 2 knots tailwind.

| WEIGHT-POUNDS | TAKEOFF TO 50-FOOT OBSTACLE SPEED-KIAS | PRESSURE ALTITUDE- FEET | 20°C (68°F) | | 30°C (86°F) | | 40°C (104°F) | |
|---------------|--|-------------------------|--------------------|---------------------------------|--------------------|---------------------------------|--------------------|---------------------------------|
| | | | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50 FEET |
| 7450 | 100 | Sea Level | 1880 | 2470 | 2080 | 2800 | 2300 | 3230 |
| | | 1000 | 2000 | 2630 | 2210 | 3000 | 2450 | 3490 |
| | | 2000 | 2130 | 2810 | 2360 | 3210 | 2620 | 3780 |
| | | 3000 | 2270 | 3000 | 2510 | 3450 | 2790 | 4110 |
| | | 4000 | 2420 | 3210 | 2680 | 3720 | 2980 | 4500 |
| | | 5000 | 2580 | 3450 | 2860 | 4030 | 3190 | 4970 |
| | | 6000 | 2750 | 3710 | 3060 | 4380 | 3410 | 5570 |
| | | 7000 | 2940 | 4000 | 3270 | 4800 | 3650 | 6380 |
| | | 8000 | 3150 | 4330 | 3500 | 5290 | 3910 | 7570 |
| | | 9000 | 3370 | 4710 | 3750 | 5910 | 4200 | 9690 |
| | | 10,000 | 3610 | 5160 | 4020 | 6730 | 4510 | 15,290 |
| 6800 | 96 | Sea Level | 1510 | 1940 | 1660 | 2180 | 1840 | 2460 |
| | | 1000 | 1600 | 2060 | 1770 | 2320 | 1950 | 2630 |
| | | 2000 | 1700 | 2190 | 1880 | 2470 | 2080 | 2820 |
| | | 3000 | 1810 | 2340 | 2000 | 2640 | 2220 | 3020 |
| | | 4000 | 1930 | 2490 | 2130 | 2820 | 2370 | 3250 |
| | | 5000 | 2060 | 2660 | 2280 | 3020 | 2530 | 3500 |
| | | 6000 | 2190 | 2840 | 2430 | 3240 | 2700 | 3790 |
| | | 7000 | 2340 | 3040 | 2600 | 3490 | 2890 | 4130 |
| | | 8000 | 2500 | 3260 | 2780 | 3760 | 3090 | 4520 |
| | | 9000 | 2680 | 3500 | 2970 | 4080 | 3310 | 4990 |
| | | 10,000 | 2870 | 3770 | 3180 | 4430 | 3550 | 5570 |
| 6200 | 91 | Sea Level | 1180 | 1520 | 1300 | 1690 | 1460 | 1920 |
| | | 1000 | 1280 | 1640 | 1410 | 1820 | 1550 | 2040 |
| | | 2000 | 1360 | 1740 | 1500 | 1930 | 1650 | 2170 |
| | | 3000 | 1450 | 1840 | 1590 | 2060 | 1760 | 2320 |
| | | 4000 | 1540 | 1960 | 1700 | 2190 | 1880 | 2480 |
| | | 5000 | 1640 | 2080 | 1810 | 2340 | 2000 | 2650 |
| | | 6000 | 1750 | 2220 | 1930 | 2490 | 2140 | 2840 |
| | | 7000 | 1860 | 2370 | 2060 | 2670 | 2280 | 3050 |
| | | 8000 | 1990 | 2530 | 2200 | 2860 | 2440 | 3290 |
| | | 9000 | 2130 | 2700 | 2350 | 3060 | 2610 | 3550 |
| | | 10,000 | 2270 | 2890 | 2510 | 3300 | 2790 | 3850 |
| 5600 | 86 | Sea Level | 920 | 1190 | 1010 | 1310 | 1110 | 1460 |
| | | 1000 | 980 | 1260 | 1080 | 1390 | 1190 | 1550 |
| | | 2000 | 1040 | 1330 | 1140 | 1470 | 1290 | 1670 |
| | | 3000 | 1110 | 1410 | 1240 | 1590 | 1370 | 1780 |
| | | 4000 | 1210 | 1520 | 1320 | 1690 | 1460 | 1890 |
| | | 5000 | 1280 | 1620 | 1410 | 1800 | 1550 | 2010 |
| | | 6000 | 1360 | 1720 | 1500 | 1910 | 1660 | 2150 |
| | | 7000 | 1450 | 1830 | 1600 | 2040 | 1770 | 2290 |
| | | 8000 | 1550 | 1950 | 1710 | 2170 | 1890 | 2450 |
| | | 9000 | 1650 | 2070 | 1820 | 2320 | 2010 | 2630 |
| | | 10,000 | 1770 | 2210 | 1950 | 2480 | 2150 | 2820 |

Figure 5-10 (Sheet 2 of 2)

ACCELERATE STOP DISTANCE

CONDITIONS:

1. 2235 RPM and 39.0 Inches Hg. Manifold Pressure Before Brake Release.
2. Mixtures - CHECK Fuel Flows In the White Arc.
3. Wing Flaps - UP.
4. Cowl Flaps - OPEN (If Installed).
5. Level, Hard Surface, Dry Runway.
6. Engine Failure at Engine Failure Speed.
7. Idle Power and Maximum Effective Braking After Engine Failure.

NOTE:

1. If full power is applied without brakes set, distances apply from point where full power is applied.
2. Decrease distance 3% for each 4 knots headwind.
3. Increase distance 5% for each 2 knots tailwind.

| WEIGHT - POUNDS | ENGINE FAILURE SPEED - KIAS | PRESSURE ALTITUDE - FEET | TOTAL DISTANCE - FEET | | | | | | |
|-----------------|-----------------------------|--------------------------|-----------------------|----------------|-------------|----------------|----------------|----------------|-----------------|
| | | | -20°C -4°F | -10°C +14°F | 0°C 32°F | +10°C +50°F | +20°C +68°F | +30°C +86°F | +40°C +104°F |
| 7450 | 100 | Sea Level | 2900 | 3090 | 3290 | 3510 | 3750 | 4010 | 4300 |
| | | 1000 | 3030 | 3240 | 3450 | 3680 | 3940 | 4210 | 4520 |
| | | 2000 | 3180 | 3390 | 3620 | 3870 | 4140 | 4430 | 4760 |
| | | 3000 | 3340 | 3560 | 3800 | 4060 | 4350 | 4670 | 5020 |
| | | 4000 | 3500 | 3740 | 4000 | 4270 | 4580 | 4910 | 5290 |
| | | 5000 | 3680 | 3930 | 4200 | 4500 | 4820 | 5180 | 5580 |
| | | 6000 | 3860 | 4130 | 4420 | 4740 | 5080 | 5470 | 5900 |
| | | 7000 | 4060 | 4350 | 4660 | 4990 | 5360 | 5770 | 6240 |
| | | 8000 | 4280 | 4580 | 4910 | 5260 | 5660 | 6100 | 6600 |
| | | 9000 | 4510 | 4830 | 5180 | 5560 | 5980 | 6450 | 6990 |
| 10,000 | 4750 | 5090 | 5460 | 5870 | 6320 | 6830 | 7410 | | |
| 6800 | 96 | Sea Level | 2330 | 2480 | 2640 | 2850 | 3040 | 3240 | 3470 |
| | | 1000 | 2440 | 2600 | 2800 | 2990 | 3190 | 3400 | 3650 |
| | | 2000 | 2560 | 2760 | 2940 | 3130 | 3350 | 3580 | 3840 |
| | | 3000 | 2710 | 2890 | 3080 | 3290 | 3520 | 3760 | 4040 |
| | | 4000 | 2850 | 3040 | 3240 | 3460 | 3700 | 3960 | 4260 |
| | | 5000 | 2990 | 3190 | 3400 | 3640 | 3890 | 4170 | 4490 |
| | | 6000 | 3140 | 3350 | 3580 | 3830 | 4100 | 4400 | 4730 |
| | | 7000 | 3300 | 3530 | 3770 | 4030 | 4320 | 4640 | 5000 |
| | | 8000 | 3470 | 3710 | 3970 | 4250 | 4560 | 4900 | 5290 |
| | | 9000 | 3650 | 3910 | 4180 | 4480 | 4810 | 5180 | 5590 |
| 10,000 | 3850 | 4120 | 4420 | 4730 | 5090 | 5480 | 5920 | | |
| 6200 | 91 | Sea Level | 1890 | 2010 | 2140 | 2280 | 2430 | 2590 | 2790 |
| | | 1000 | 1980 | 2110 | 2240 | 2390 | 2570 | 2750 | 2930 |
| | | 2000 | 2080 | 2210 | 2350 | 2530 | 2700 | 2880 | 3090 |
| | | 3000 | 2180 | 2320 | 2500 | 2660 | 2840 | 3030 | 3250 |
| | | 4000 | 2280 | 2460 | 2620 | 2800 | 2980 | 3190 | 3420 |
| | | 5000 | 2420 | 2580 | 2750 | 2940 | 3140 | 3360 | 3600 |
| | | 6000 | 2540 | 2710 | 2890 | 3090 | 3300 | 3540 | 3800 |
| | | 7000 | 2670 | 2850 | 3050 | 3250 | 3480 | 3730 | 4010 |
| | | 8000 | 2810 | 3000 | 3210 | 3430 | 3670 | 3930 | 4230 |
| | | 9000 | 2960 | 3160 | 3380 | 3610 | 3870 | 4150 | 4470 |
| 10,000 | 3120 | 3330 | 3560 | 3810 | 4090 | 4390 | 4730 | | |
| 5600 | 86 | Sea Level | 1500 | 1600 | 1700 | 1800 | 1920 | 2040 | 2180 |
| | | 1000 | 1570 | 1670 | 1780 | 1890 | 2010 | 2140 | 2290 |
| | | 2000 | 1650 | 1750 | 1870 | 1980 | 2110 | 2250 | 2430 |
| | | 3000 | 1730 | 1840 | 1960 | 2080 | 2220 | 2390 | 2560 |
| | | 4000 | 1810 | 1930 | 2060 | 2190 | 2360 | 2520 | 2690 |
| | | 5000 | 1900 | 2030 | 2160 | 2330 | 2480 | 2650 | 2830 |
| | | 6000 | 2000 | 2130 | 2290 | 2440 | 2610 | 2790 | 2980 |
| | | 7000 | 2100 | 2260 | 2410 | 2570 | 2750 | 2940 | 3150 |
| | | 8000 | 2230 | 2380 | 2540 | 2710 | 2890 | 3090 | 3320 |
| | | 9000 | 2350 | 2500 | 2670 | 2850 | 3050 | 3260 | 3500 |
| 10,000 | 2470 | 2640 | 2820 | 3010 | 3220 | 3450 | 3700 | | |

Figure 5-11

ACCELERATION

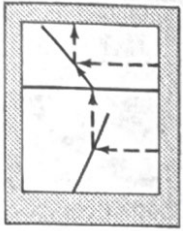
5 PAX @ 170# = 850
 EW - 5296
 WAO 850
 150 me 6296
 Kuel 1236 7450
 7532
 197 -

CONDITIONS:

- 2235 RPM and 39.0 Inches Before Brake Release.
 - Mixtures - CHECK Fuel F
 - Wing Flaps - UP.
 - Cowl Flaps - OPEN (If Installed).
 - Level Hard Surface Dry Runway.
 - Engine Failure At Engine Failure Speed.
 - Propeller Feathered and Landing Gear Retracted During Climb.
 - Maintain Engine Failure Speed Until Clear of Obstacle.
- power is applied without brakes set, distances apply from point where full power is applied.
- Decrease distance 6% for each 10 knots headwind.
 - Increase distance 2% for each 1 knot of tailwind.
 - Distance in boxes represent rates of climb less than 50 ft/min.

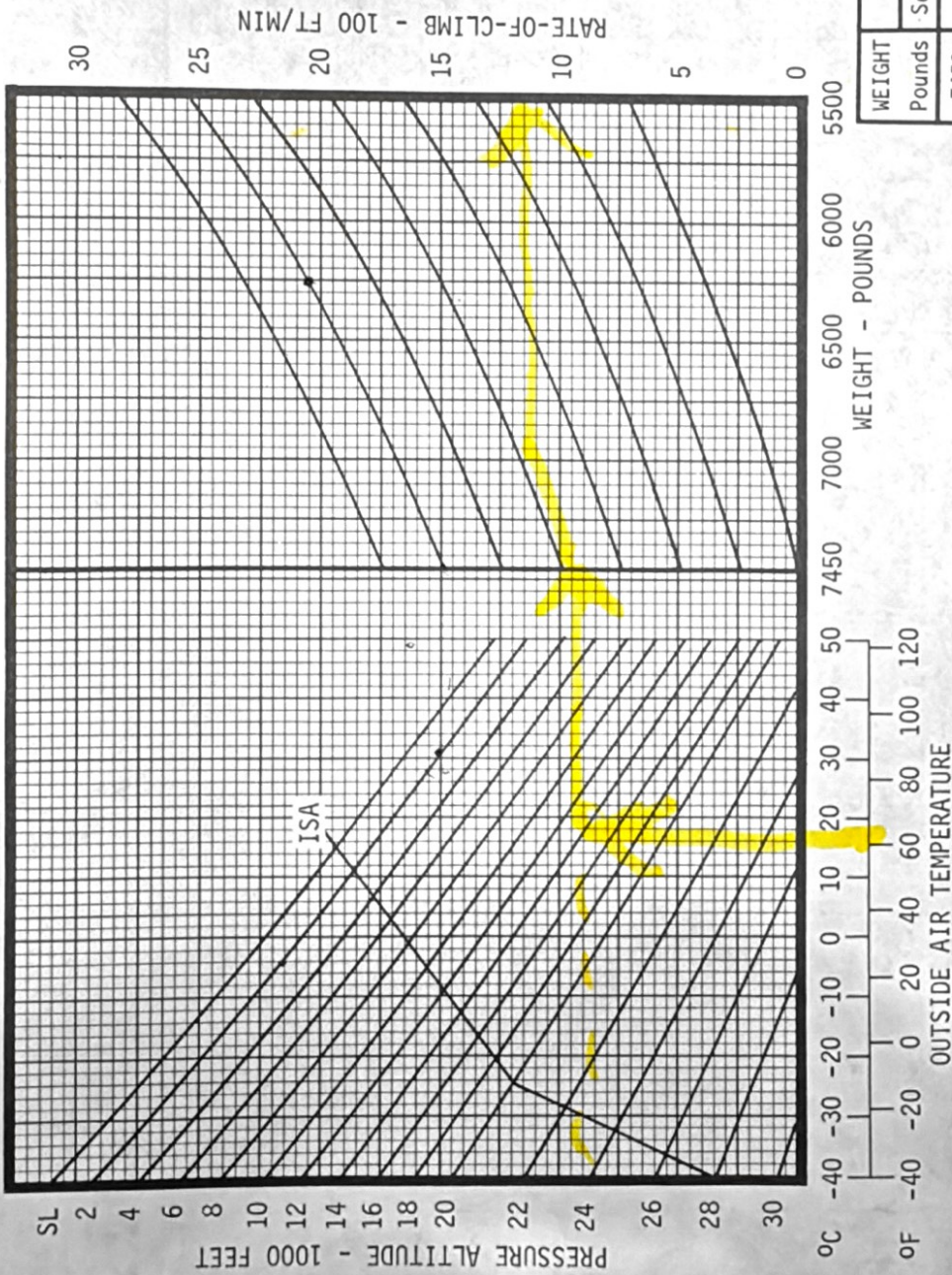
| WEIGHT - POUNDS | ENGINE FAILURE SPEED - KIAS | PRESSURE ALTITUDE FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE - FEET | | | | | | |
|-----------------|-----------------------------|------------------------|---|----------------|-------------|----------------|----------------|----------------|-----------------|
| | | | -20°C -4°F | -10°C +14°F | 0°C 32°F | +10°C +50°F | +20°C +68°F | +30°C +86°F | +40°C +104°F |
| 7450 | 100 | Sea Level | 2390 | 2770 | 3290 | 4120 | 5800 | 12,210 | ----- |
| | | 1000 | 2550 | 2980 | 3590 | 4630 | 7020 | ----- | ----- |
| | | 2000 | 2740 | 3220 | 3950 | 5280 | 9100 | ----- | ----- |
| | | 3000 | 2940 | 3500 | 4390 | 6190 | 13,540 | ----- | ----- |
| | | 4000 | 3170 | 3830 | 4940 | 7570 | ----- | ----- | ----- |
| | | 5000 | 3440 | 4220 | 5670 | 9990 | ----- | ----- | ----- |
| | | 6000 | 3750 | 4710 | 6710 | 15,590 | ----- | ----- | ----- |
| | | 7000 | 4120 | 5340 | 8330 | ----- | ----- | ----- | ----- |
| | | 8000 | 4570 | 6190 | 11,350 | ----- | ----- | ----- | ----- |
| | | 9000 | 5130 | 7430 | ----- | ----- | ----- | ----- | ----- |
| | | 10,000 | 5870 | 9480 | ----- | ----- | ----- | ----- | ----- |
| 6800 | 96 | Sea Level | 1770 | 2000 | 2270 | 2670 | 3180 | 4010 | 5770 |
| | | 1000 | 1880 | 2120 | 2460 | 2870 | 3470 | 4510 | 7070 |
| | | 2000 | 2000 | 2290 | 2640 | 3100 | 3620 | 5170 | 9360 |
| | | 3000 | 2150 | 2450 | 2830 | 3370 | 4240 | 6080 | 14,690 |
| | | 4000 | 2290 | 2620 | 3050 | 3690 | 4780 | 7480 | ----- |
| | | 5000 | 2450 | 2810 | 3310 | 4060 | 5490 | 9990 | ----- |
| | | 6000 | 2620 | 3030 | 3600 | 4530 | 6480 | 16,070 | ----- |
| | | 7000 | 2810 | 3270 | 3950 | 5120 | 8040 | ----- | ----- |
| | | 8000 | 3020 | 3560 | 4370 | 5900 | 10,930 | ----- | ----- |
| | | 9000 | 3270 | 3890 | 4890 | 7040 | ----- | ----- | ----- |
| | | 10,000 | 3550 | 4280 | 5560 | 8880 | ----- | ----- | ----- |
| 6200 | 91 | Sea Level | 1380 | 1530 | 1710 | 1930 | 2200 | 2570 | 3120 |
| | | 1000 | 1460 | 1620 | 1810 | 2050 | 2380 | 2800 | 3420 |
| | | 2000 | 1540 | 1720 | 1930 | 2210 | 2550 | 3030 | 3780 |
| | | 3000 | 1630 | 1820 | 2080 | 2360 | 2740 | 3290 | 4220 |
| | | 4000 | 1730 | 1960 | 2210 | 2530 | 2960 | 3610 | 4780 |
| | | 5000 | 1860 | 2080 | 2360 | 2720 | 3210 | 3980 | 5540 |
| | | 6000 | 1970 | 2220 | 2520 | 2920 | 3500 | 4450 | 6650 |
| | | 7000 | 2100 | 2370 | 2710 | 3160 | 3840 | 5050 | 8470 |
| | | 8000 | 2240 | 2540 | 2910 | 3430 | 4250 | 5860 | 12,200 |
| | | 9000 | 2390 | 2720 | 3150 | 3750 | 4760 | 7060 | ----- |
| | | 10,000 | 2560 | 2930 | 3410 | 4130 | 5420 | 9060 | ----- |
| 5600 | 86 | Sea Level | 1070 | 1180 | 1300 | 1440 | 1610 | 1820 | 2090 |
| | | 1000 | 1130 | 1240 | 1370 | 1530 | 1710 | 1940 | 2240 |
| | | 2000 | 1190 | 1310 | 1450 | 1620 | 1820 | 2070 | 2430 |
| | | 3000 | 1260 | 1390 | 1540 | 1720 | 1930 | 2240 | 2610 |
| | | 4000 | 1330 | 1470 | 1630 | 1820 | 2090 | 2390 | 2820 |
| | | 5000 | 1400 | 1550 | 1730 | 1960 | 2230 | 2570 | 3050 |
| | | 6000 | 1490 | 1650 | 1860 | 2090 | 2380 | 2760 | 3330 |
| | | 7000 | 1580 | 1770 | 1980 | 2230 | 2550 | 2990 | 3650 |
| | | 8000 | 1690 | 1880 | 2110 | 2380 | 2740 | 3240 | 4050 |
| | | 9000 | 1800 | 2000 | 2250 | 2550 | 2960 | 3540 | 4540 |
| | | 10,000 | 1910 | 2140 | 2400 | 2740 | 3200 | 3890 | 5170 |

Figure 5-12



- CONDITIONS:**
- 2235 RPM and 39.0 Inches Hg. to 20,000 Feet. Use Placarded Manifold Pressure Above 20,000 Feet.
 - Landing Gear - UP.
 - Wing Flaps - UP.
 - Cowl Flaps - OPEN (If Installed)
 - Mixture at Recommended Fuel Flow.

RATE-OF-CLIMB - MAXIMUM CLIMB



| WEIGHT Pounds | CLIMB SPEED - KIAS | | |
|------------------|--------------------|-------------|-------------|
| | Sea Level | 20,000 Feet | 30,000 Feet |
| 7450 | 111 | 105 | 100 |
| 6800 | 106 | 99 | 95 |
| 6200 | 99 | 95 | 91 |
| 5600 | 95 | 90 | 86 |

Figure 5-13

RATE-OF-CLIMB - CRUISE CLIMB

CONDITIONS:

1. 1900 RPM and 32.5 Inches Hg.
2. Landing Gear - UP.
3. Wing Flaps - UP.
4. Cowl Flaps - AS REQUIRED (If Installed).
5. Airspeed - 120 KIAS.
6. Mixtures - Recommended Fuel Flow.

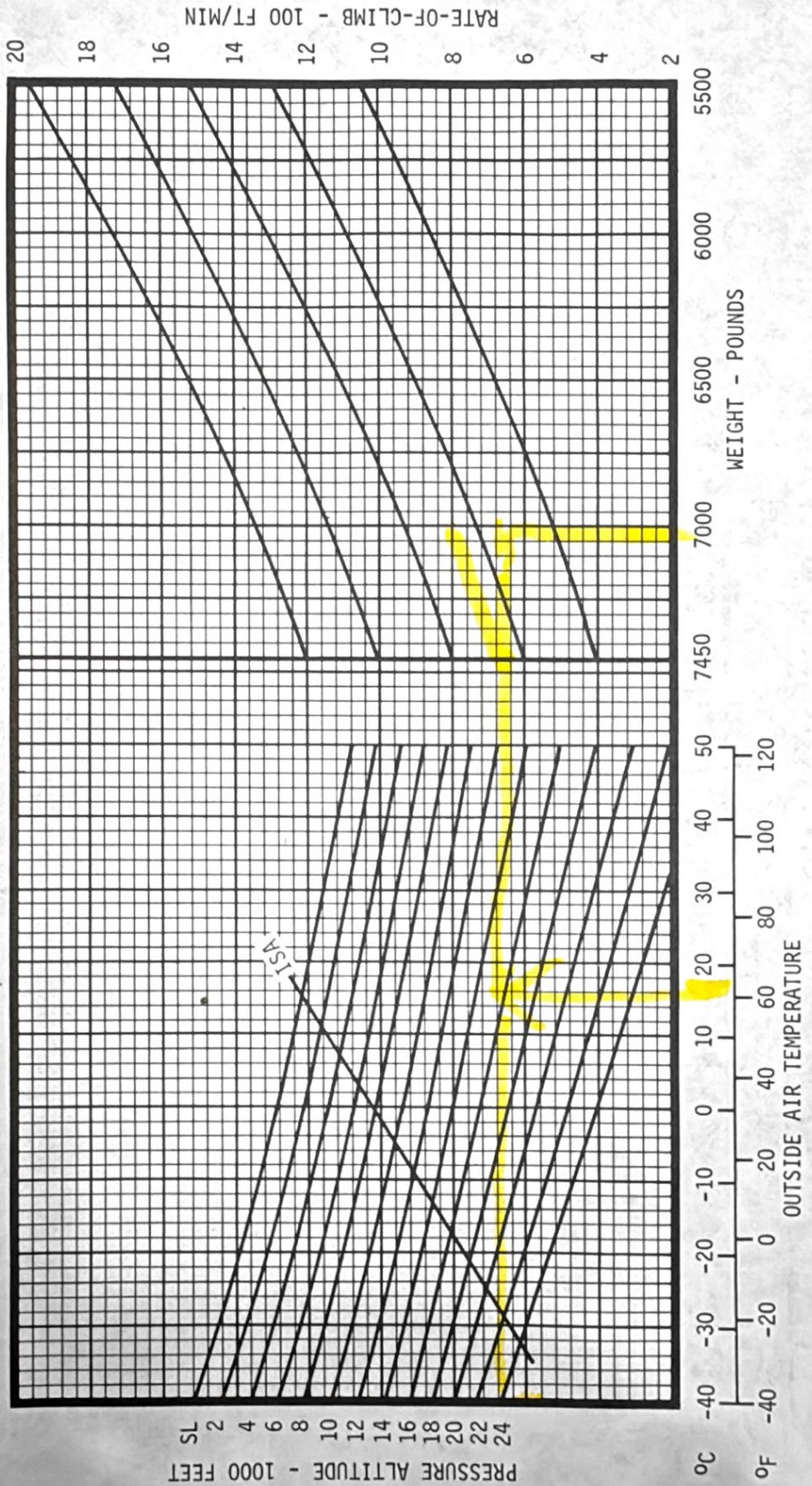
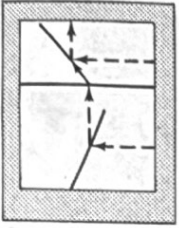
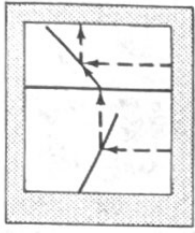


Figure 5-14



- CONDITIONS:**
1. 2235 RPM and 39.0 Inches Hg to 20,000 Feet. Use Placarded Manifold Pressure Above 20,000 Feet.
 2. Mixture - CHECK Fuel Flow in the White Arc.
 3. Landing Gear - UP.
 4. Wing Flaps - UP.
 5. Inoperative Propeller - FEATHERED.
 6. Wings Banked 5° Toward Operative Engine With Approximately 1/2 Ball Slip Indicated on the Turn and Bank Indicator.
 7. Cowl Flaps - CLOSED on Inoperative Engine (If Installed).

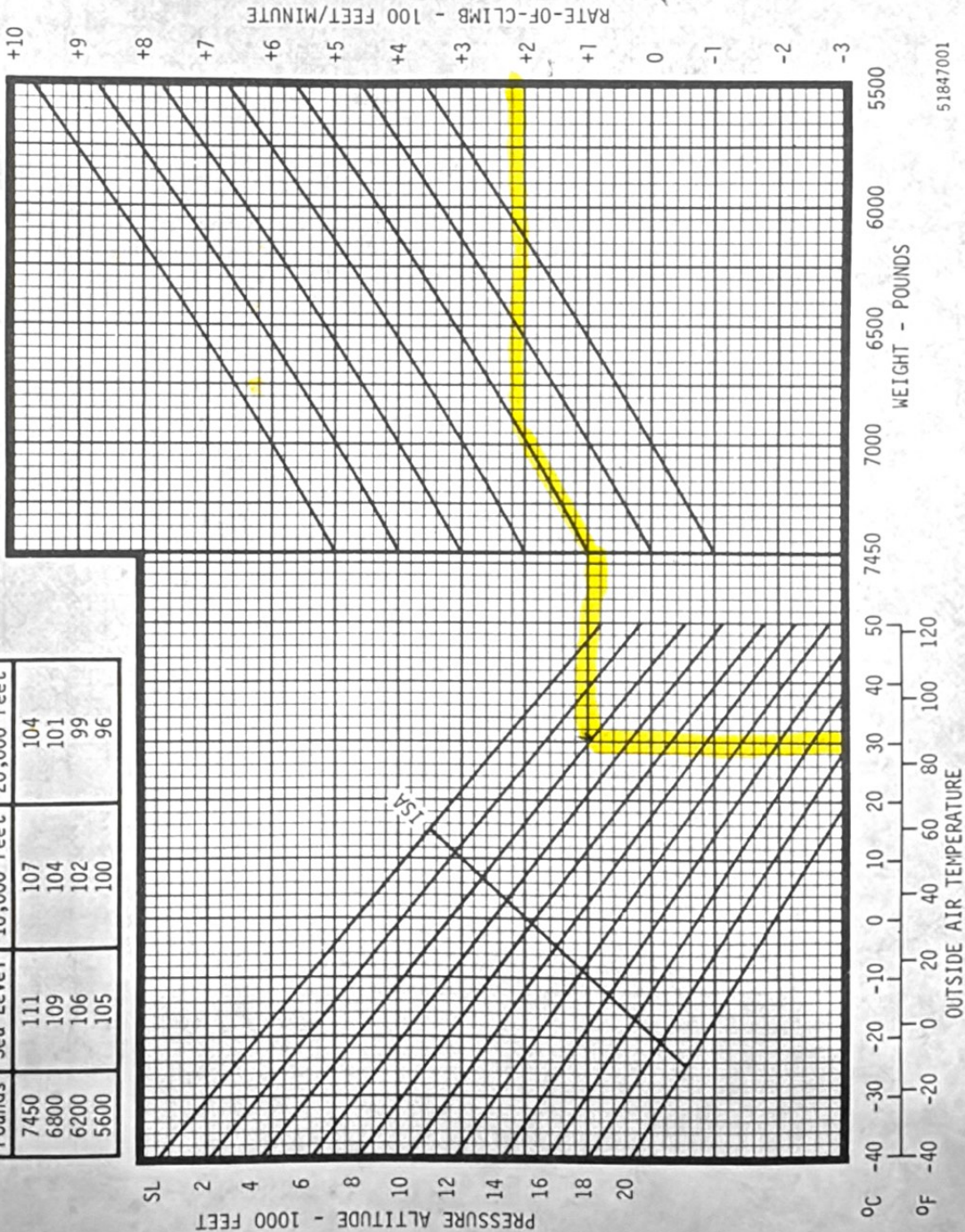
NOTE: Approximate Effect of Configuration on One Engine Inoperative Rate-of-Climb.

Subtract values listed below from value obtained in above graph. Effects for a combination of gear, flap or windmilling propeller may be obtained by adding the effects for each.

| | |
|--------------------|------------|
| Inoperative Engine | 400 Ft/Min |
| Windmilling | 350 Ft/Min |
| Gear Down | 200 Ft/Min |
| Flaps Down 15° | 800 Ft/Min |
| Flaps Down 45° | 800 Ft/Min |

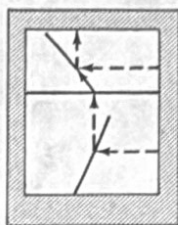
RATE-OF-CLIMB - ONE ENGINE INOPERATIVE

| WEIGHT Pounds | CLIMB SPEED - KIAS | |
|------------------|--------------------|-------------|
| | Sea Level | 20,000 Feet |
| 7450 | 111 | 104 |
| 6800 | 109 | 101 |
| 6200 | 106 | 99 |
| 5600 | 105 | 96 |



51847001

Figure 5-15



- CONDITIONS:
1. 2235 RPM and 39.0 Inches Hg.
 2. Mixtures - CHECK Fuel Flows
In The White Arc.
 3. Landing Gear - DOWN.
 4. Wing Flaps - 45°.
 5. Cowl Flaps - OPEN (If Installed).
 6. Climb Speed - 96 KIAS.

RATE-OF-CLIMB - BALKED LANDING CLIMB

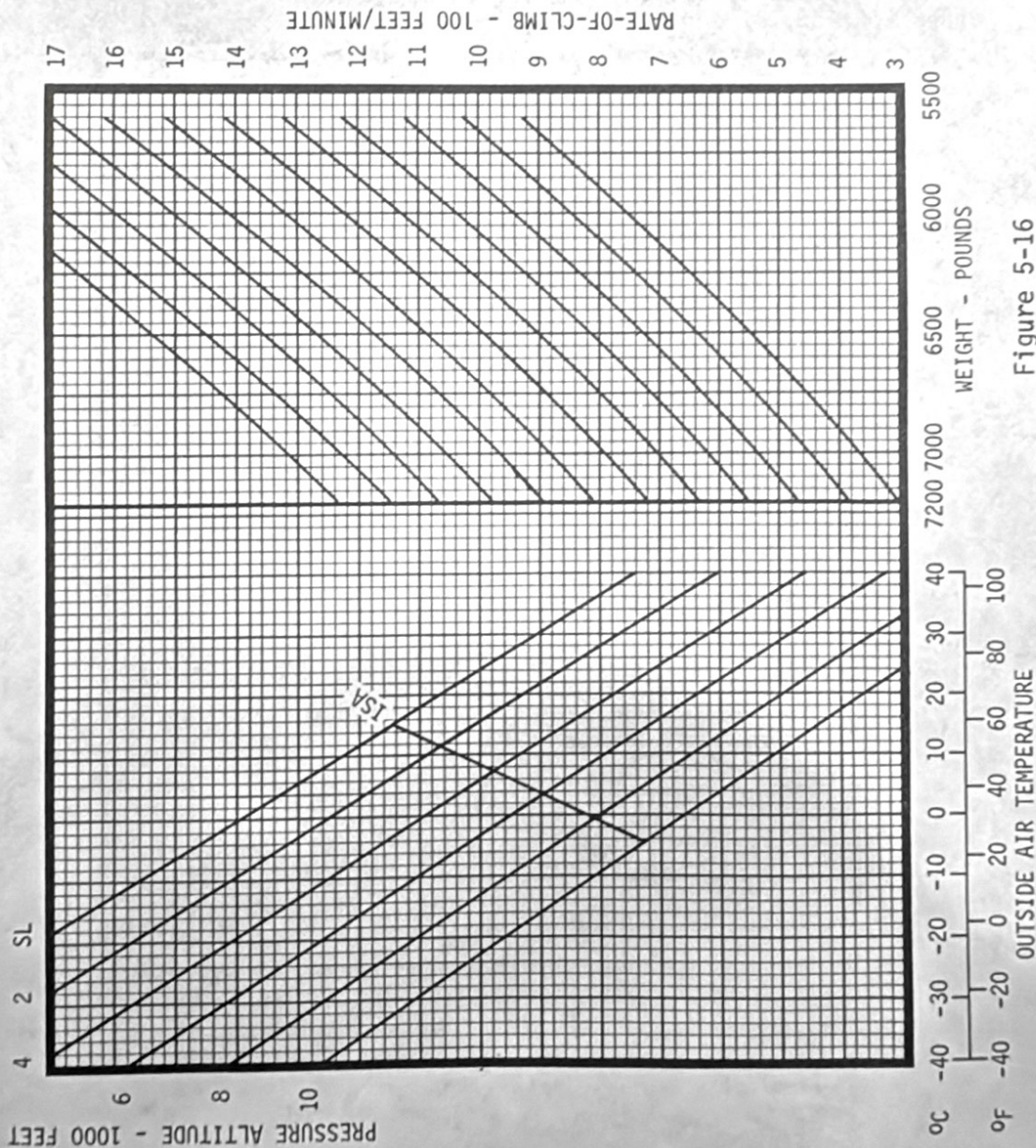


Figure 5-16

7400-6800-650 - 108 GAC
 SECTION 5 68-62-700 - 116 GAC
 PERFORMANCE 62-56-660

Cessna
 MODEL **421C**

ONE ENGINE INOPERATIVE SERVICE CEILING

CONDITIONS:

- 1. One Engine Inoperative Climb Configuration.

NOTE:

- 1. One engine inoperative service ceiling is the maximum altitude where the airplane has the capability of climbing 50 feet per minute with one engine inoperative and feathered.
- 2. Increase indicated service ceiling 100 feet for each 0.10 inches Hg. altimeter setting greater than 29.92.
- 3. Decrease indicated service ceiling 100 feet for each 0.10 inches Hg. altimeter setting less than 29.92.
- 4. This chart provides performance information to aid in route selection when operating under FAR 135.181 and 91.119 requirements.

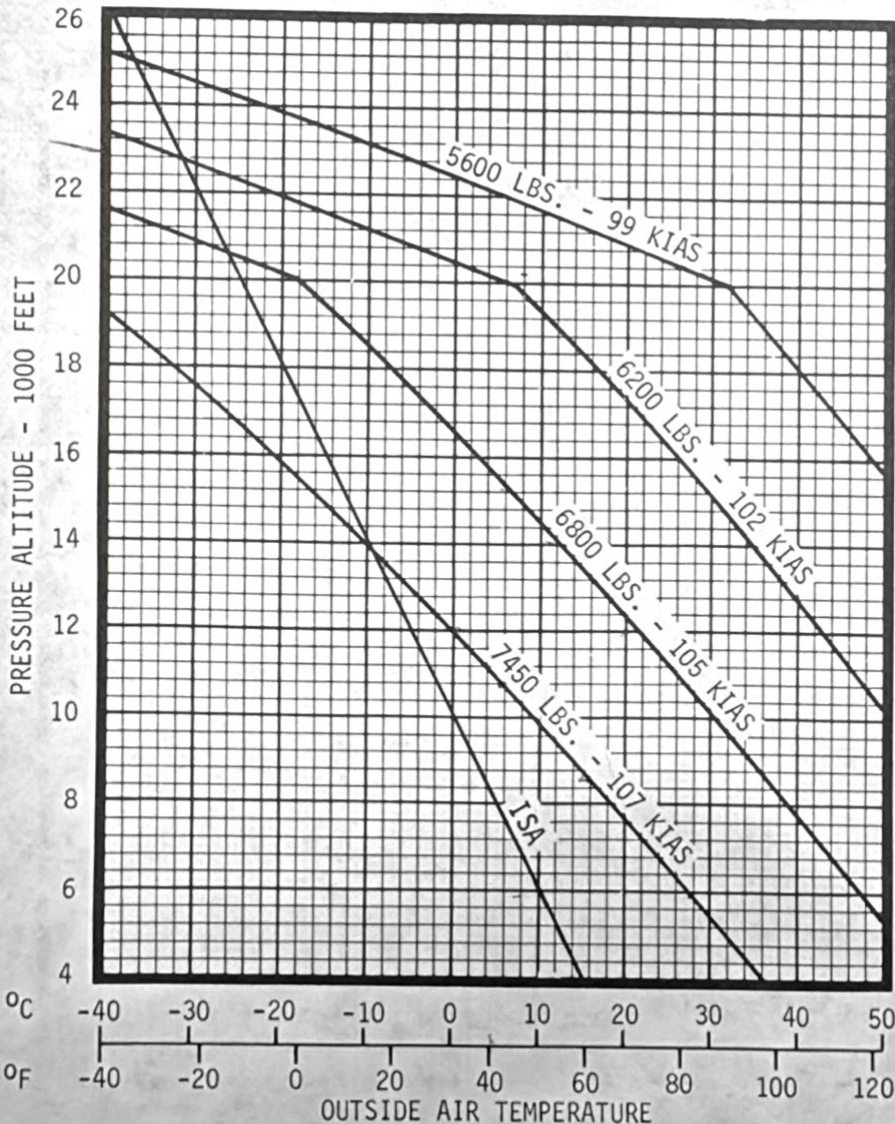
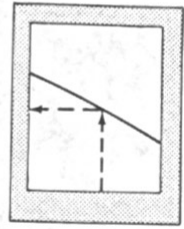
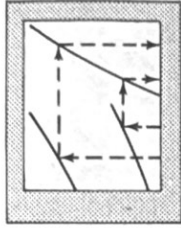


Figure 5-17

51847004

TIME, FUEL AND DISTANCE TO CLIMB - MAXIMUM CLIMB



CONDITIONS:

1. 2235 RPM and 39.0 Inches Hg. to 20,000 Feet. Use Placarded Manifold Pressure Above 20,000 Feet.
2. Landing Gear - UP.
3. Wing Flaps - UP.
4. Cowl Flaps - OPEN (If Installed)
5. Mixture at Recommended Fuel Flow.

NOTE:

1. Time, fuel and distance for the climb are determined by taking the difference between the airport altitude and initial cruise altitude conditions.
2. For total fuel used, add 46 pounds for start, taxi and takeoff.

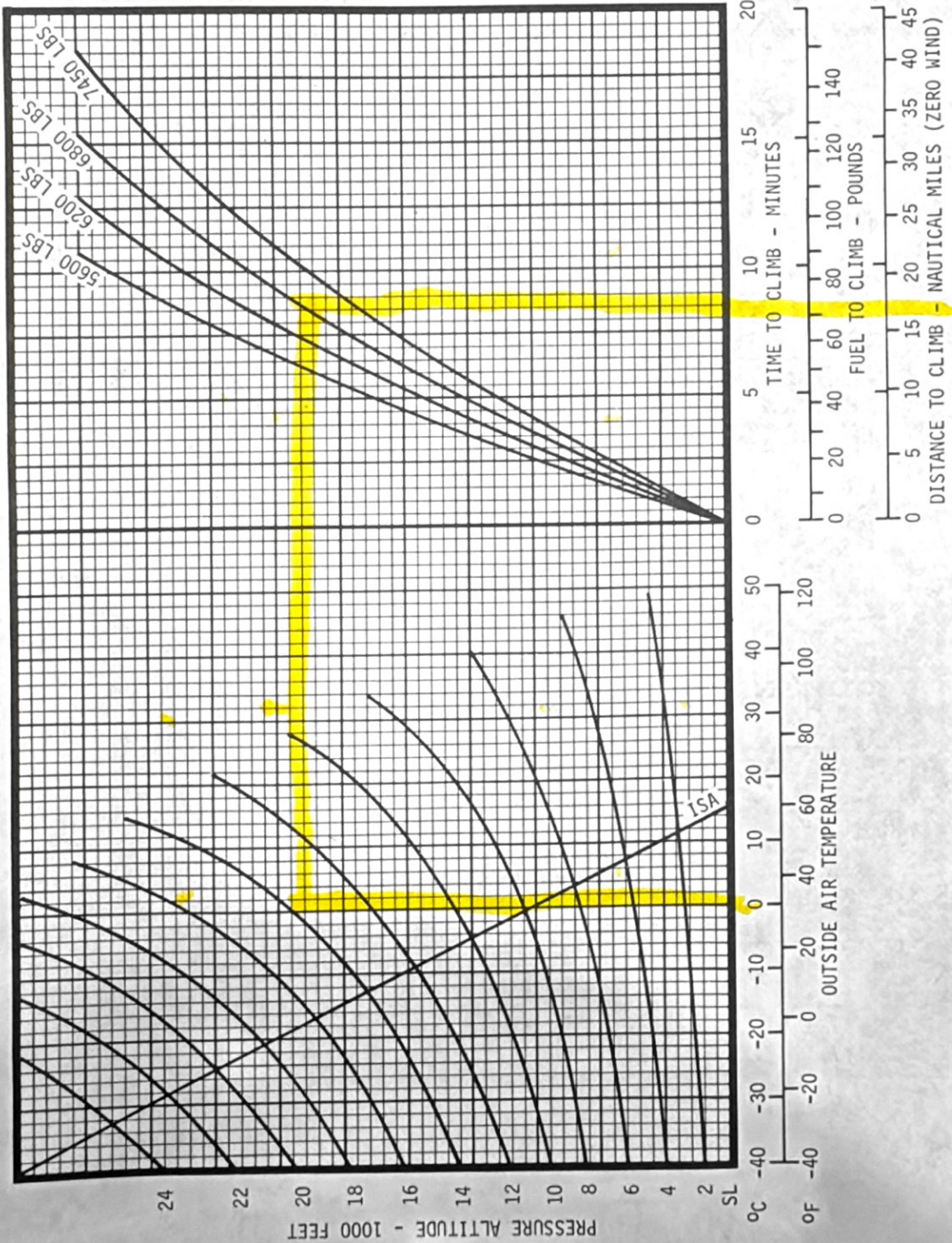
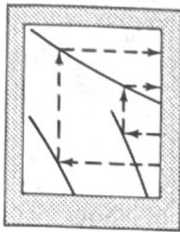


Figure 5-18



CONDITIONS:

1. 1900 RPM and 32.5 Inches Hg.
2. Landing Gear - UP.
3. Wing Flaps - UP.
4. Cowl Flaps - AS REQUIRED (If Installed).
5. Airspeed - 120 KIAS.
6. Fuel Flow - BLUE TRIANGLE.

NOTE:

1. Time, fuel and distance for the climb are determined by taking the difference between the airport altitude and initial cruise altitude conditions.
2. For total fuel used, add 46 pounds for start, taxi and takeoff.

TIME, FUEL AND DISTANCE TO CLIMB - CRUISE CLIMB

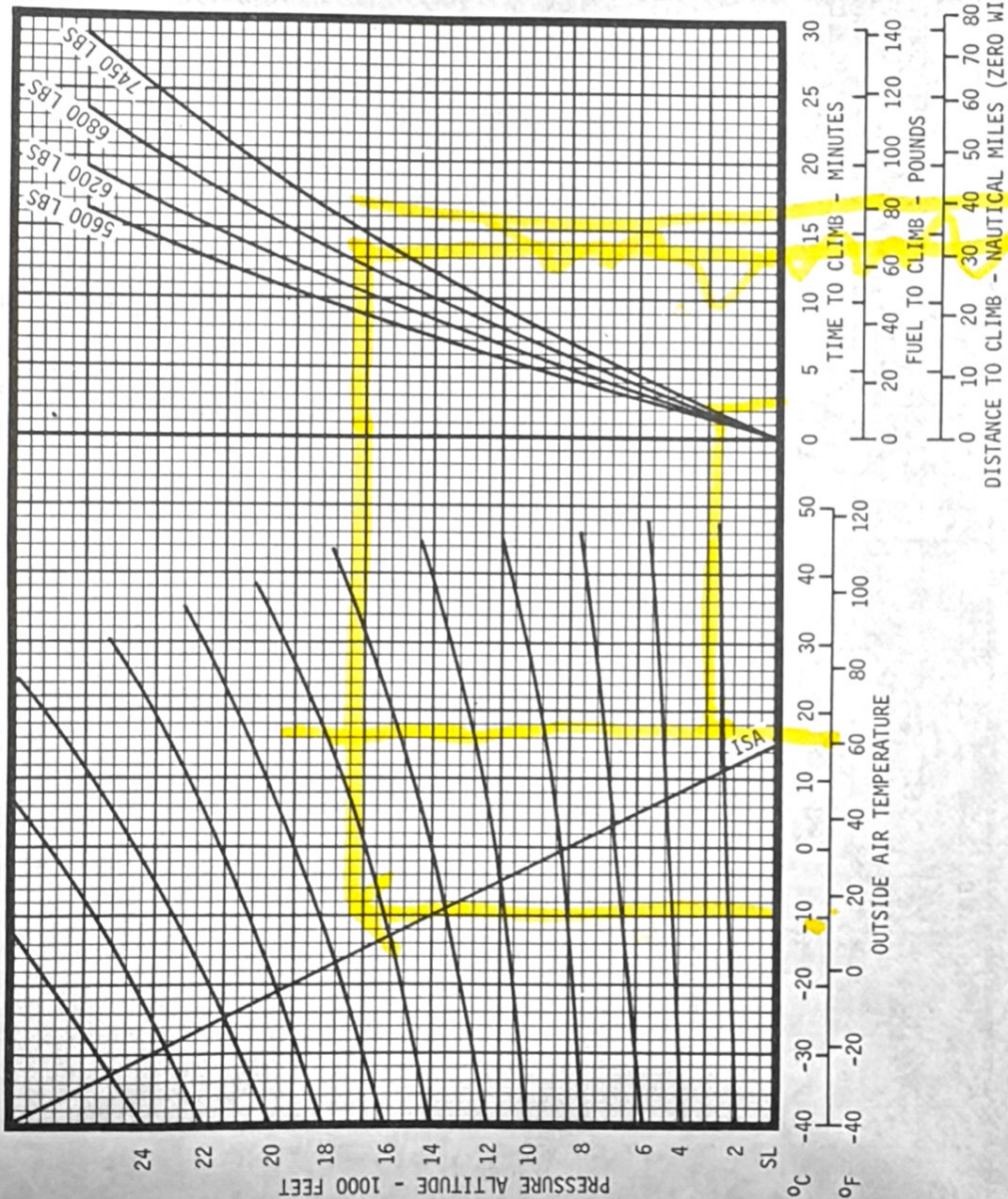


Figure 5-19

CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE

NOTE:

1. At Sea Level, increase speed by 4 KTAS for each 1000 pounds below 7450 pounds.
2. At 5000 feet, increase speed by 4 KTAS for each 1000 pounds below 7450 pounds.
3. Operations at peak EGT may be utilized with power settings within the boxes if the airplane is equipped with the optional EGT system.

| ALTITUDE | RPM | MP | -5°C (23°F) | | | 15°C (STD TEMP) (59°F) | | | 35°C (95°F) | | |
|--------------|------|------|----------------|------|----------------|---------------------------|------|----------------|----------------|------|----------------|
| | | | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR |
| SEA LEVEL | 1900 | 32.5 | 78.0 | 186 | 271 | 73.5 | 186 | 257 | 69.0 | 185 | 242 |
| | 1900 | 31.0 | 74.3 | 183 | 260 | 70.0 | 183 | 246 | 65.7 | 182 | 231 |
| | 1900 | 29.0 | 68.8 | 177 | 241 | 64.8 | 177 | 228 | 60.8 | 176 | 216 |
| | 1900 | 27.0 | 63.0 | 171 | 223 | 59.3 | 171 | 211 | 55.7 | 170 | 200 |
| | 1900 | 25.0 | 57.1 | 165 | 204 | 53.8 | 164 | 194 | 50.5 | 163 | 183 |
| | 1800 | 32.5 | 73.2 | 182 | 256 | 69.0 | 182 | 242 | 64.8 | 181 | 228 |
| | 1800 | 31.0 | 69.9 | 178 | 245 | 65.9 | 178 | 232 | 61.8 | 177 | 219 |
| | 1800 | 29.0 | 64.3 | 173 | 227 | 60.6 | 172 | 215 | 56.9 | 171 | 204 |
| | 1800 | 27.0 | 58.8 | 167 | 210 | 55.4 | 166 | 199 | 52.0 | 165 | 188 |
| | 1800 | 25.0 | 53.0 | 160 | 191 | 49.9 | 159 | 181 | 46.9 | 157 | 172 |
| | 1800 | 23.0 | 47.4 | 152 | 173 | 44.7 | 151 | 165 | 42.0 | 149 | 156 |
| | 1700 | 32.5 | 69.2 | 178 | 243 | 65.2 | 177 | 230 | 61.2 | 177 | 217 |
| | 1700 | 31.0 | 65.5 | 174 | 230 | 61.7 | 174 | 219 | 57.9 | 173 | 207 |
| | 1700 | 29.0 | 60.5 | 169 | 215 | 57.0 | 168 | 204 | 53.5 | 167 | 193 |
| | 1700 | 27.0 | 54.9 | 162 | 197 | 51.7 | 161 | 187 | 48.6 | 160 | 177 |
| | 1700 | 25.0 | 49.6 | 155 | 180 | 46.8 | 154 | 171 | 43.9 | 152 | 162 |
| | 1700 | 23.0 | 44.1 | 147 | 163 | 41.6 | 146 | 155 | 39.0 | 143 | 147 |
| | 1600 | 32.5 | 63.4 | 172 | 224 | 59.7 | 171 | 212 | 56.1 | 170 | 201 |
| | 1600 | 31.0 | 60.0 | 168 | 213 | 56.6 | 168 | 203 | 53.1 | 166 | 192 |
| | 1600 | 29.0 | 55.3 | 163 | 199 | 52.1 | 162 | 188 | 48.9 | 160 | 178 |
| 1600 | 27.0 | 50.3 | 156 | 183 | 47.4 | 155 | 173 | 44.5 | 153 | 164 | |
| 1600 | 25.0 | 45.5 | 149 | 167 | 42.9 | 148 | 159 | 40.2 | 145 | 151 | |
| | | | -15°C (5°F) | | | 5°C (STD TEMP) (41°F) | | | 25°C (77°F) | | |
| 5000 FEET | 1900 | 32.5 | 78.0 | 195 | 271 | 73.5 | 195 | 257 | 69.0 | 194 | 242 |
| | 1900 | 31.0 | 74.3 | 191 | 260 | 70.0 | 191 | 246 | 65.7 | 190 | 231 |
| | 1900 | 29.0 | 68.8 | 185 | 241 | 64.8 | 185 | 228 | 60.8 | 184 | 216 |
| | 1900 | 27.0 | 63.0 | 179 | 223 | 59.3 | 178 | 211 | 55.7 | 177 | 200 |
| | 1900 | 25.0 | 57.1 | 172 | 204 | 53.8 | 171 | 194 | 50.5 | 170 | 183 |
| | 1800 | 32.5 | 73.2 | 190 | 256 | 69.0 | 190 | 242 | 64.8 | 189 | 228 |
| | 1800 | 31.0 | 69.9 | 187 | 245 | 65.9 | 186 | 232 | 61.8 | 185 | 219 |
| | 1800 | 29.0 | 64.3 | 181 | 227 | 60.6 | 180 | 215 | 56.9 | 179 | 204 |
| | 1800 | 27.0 | 58.8 | 174 | 210 | 55.4 | 173 | 199 | 52.0 | 172 | 188 |
| | 1800 | 25.0 | 53.0 | 167 | 191 | 49.9 | 165 | 181 | 46.9 | 164 | 172 |
| | 1800 | 23.0 | 47.4 | 158 | 173 | 44.7 | 157 | 165 | 42.0 | 154 | 156 |
| | 1700 | 32.5 | 69.2 | 186 | 243 | 65.2 | 186 | 230 | 61.2 | 184 | 217 |
| | 1700 | 31.0 | 65.5 | 182 | 230 | 61.7 | 181 | 219 | 57.9 | 180 | 207 |
| | 1700 | 29.0 | 60.5 | 176 | 215 | 57.0 | 175 | 204 | 53.5 | 174 | 193 |
| | 1700 | 27.0 | 54.9 | 169 | 197 | 51.7 | 168 | 187 | 48.6 | 166 | 177 |
| | 1700 | 25.0 | 49.6 | 162 | 180 | 46.8 | 161 | 171 | 43.9 | 158 | 162 |
| | 1700 | 23.0 | 44.1 | 153 | 163 | 41.6 | 151 | 155 | 39.0 | 146 | 147 |
| | 1600 | 32.5 | 63.4 | 179 | 224 | 59.7 | 179 | 212 | 56.1 | 178 | 201 |
| | 1600 | 31.0 | 60.0 | 176 | 213 | 56.6 | 175 | 203 | 53.1 | 173 | 192 |
| | 1600 | 29.0 | 55.3 | 170 | 199 | 52.1 | 169 | 188 | 48.9 | 167 | 178 |
| 1600 | 27.0 | 50.3 | 163 | 183 | 47.4 | 162 | 173 | 44.5 | 159 | 164 | |
| 1600 | 25.0 | 45.5 | 155 | 167 | 42.9 | 153 | 159 | 40.2 | 149 | 151 | |

Figure 5-20 (Sheet 1 of 3)

CRUISE PERFORMANCE WITH RECOMMENDED LEAN MIXTURE

NOTE:

1. At 10,000 Feet, increase speed by 5 KTAS for each 1000 pounds below 7450 pounds.
2. At 15,000 Feet, increase speed by 6 KTAS for each 1000 pounds below 7450 pounds.
3. Operations at peak EGT may be utilized with power settings within the boxes if the airplane is equipped with the optional EGT system.

| ALTITUDE | RPM | MP | -25°C (-13°F) | | | -5°C (STD TEMP) (23°F) | | | 15°C (59°F) | | |
|----------------|------|------|------------------|------|----------------|---------------------------|------|----------------|----------------|------|----------------|
| | | | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR |
| 10,000 FEET | 1900 | 32.5 | 78.0 | 204 | 271 | 73.5 | 204 | 257 | 69.0 | 203 | 242 |
| | 1900 | 31.0 | 74.3 | 200 | 260 | 70.0 | 200 | 246 | 65.7 | 199 | 231 |
| | 1900 | 29.0 | 68.8 | 194 | 241 | 64.8 | 194 | 228 | 60.8 | 193 | 216 |
| | 1900 | 27.0 | 63.0 | 187 | 223 | 59.3 | 187 | 211 | 55.7 | 185 | 200 |
| | 1900 | 25.0 | 57.1 | 180 | 204 | 53.8 | 179 | 194 | 50.5 | 177 | 183 |
| | 1800 | 32.5 | 73.2 | 199 | 256 | 69.0 | 199 | 242 | 64.8 | 198 | 228 |
| | 1800 | 31.0 | 69.9 | 195 | 245 | 65.9 | 195 | 232 | 61.8 | 194 | 219 |
| | 1800 | 29.0 | 64.3 | 189 | 227 | 60.6 | 188 | 215 | 56.9 | 187 | 204 |
| | 1800 | 27.0 | 58.8 | 182 | 210 | 55.4 | 181 | 199 | 52.0 | 179 | 188 |
| | 1800 | 25.0 | 53.0 | 173 | 191 | 49.9 | 172 | 181 | 46.9 | 169 | 172 |
| | 1800 | 23.0 | 47.4 | 165 | 173 | 44.7 | 162 | 165 | 42.0 | 157 | 156 |
| | 1700 | 32.5 | 69.2 | 194 | 243 | 65.2 | 194 | 230 | 61.2 | 193 | 217 |
| | 1700 | 31.0 | 65.5 | 190 | 230 | 61.7 | 190 | 219 | 57.9 | 188 | 207 |
| | 1700 | 29.0 | 60.5 | 184 | 215 | 57.0 | 183 | 204 | 53.5 | 182 | 193 |
| | 1700 | 27.0 | 54.9 | 176 | 197 | 51.7 | 175 | 187 | 48.6 | 173 | 177 |
| | 1700 | 25.0 | 49.6 | 169 | 180 | 46.8 | 167 | 171 | 43.9 | 163 | 162 |
| | 1700 | 23.0 | 44.1 | 158 | 163 | 41.6 | 155 | 155 | 39.0 | 145 | 147 |
| | 1600 | 32.5 | 63.4 | 188 | 224 | 59.7 | 187 | 212 | 56.1 | 185 | 201 |
| | 1600 | 31.0 | 60.0 | 183 | 213 | 56.6 | 183 | 203 | 53.1 | 181 | 192 |
| | 1600 | 29.0 | 55.3 | 177 | 199 | 52.1 | 176 | 188 | 48.9 | 174 | 178 |
| 1600 | 27.0 | 50.3 | 170 | 183 | 47.4 | 168 | 173 | 44.5 | 164 | 164 | |
| 1600 | 25.0 | 45.5 | 161 | 167 | 42.9 | 158 | 159 | 40.2 | 151 | 151 | |
| | | | -35°C (-30°F) | | | -15°C (STD TEMP) (6°F) | | | 5°C (42°F) | | |
| 15,000 FEET | 1900 | 32.5 | 78.0 | 214 | 271 | 73.5 | 214 | 257 | 69.0 | 213 | 242 |
| | 1900 | 31.0 | 74.3 | 210 | 260 | 70.0 | 210 | 246 | 65.7 | 208 | 231 |
| | 1900 | 29.0 | 68.8 | 203 | 241 | 64.8 | 203 | 228 | 60.8 | 201 | 216 |
| | 1900 | 27.0 | 63.0 | 196 | 223 | 59.3 | 195 | 211 | 55.7 | 193 | 200 |
| | 1900 | 25.0 | 57.1 | 187 | 204 | 53.8 | 186 | 194 | 50.5 | 183 | 183 |
| | 1800 | 32.5 | 73.2 | 209 | 256 | 69.0 | 208 | 242 | 64.8 | 207 | 228 |
| | 1800 | 31.0 | 69.9 | 205 | 245 | 65.9 | 204 | 232 | 61.8 | 203 | 219 |
| | 1800 | 29.0 | 64.3 | 198 | 227 | 60.6 | 197 | 215 | 56.9 | 195 | 204 |
| | 1800 | 27.0 | 58.8 | 190 | 210 | 55.4 | 189 | 199 | 52.0 | 186 | 188 |
| | 1800 | 25.0 | 53.0 | 181 | 191 | 49.9 | 179 | 181 | 46.9 | 174 | 172 |
| | 1800 | 23.0 | 47.4 | 171 | 173 | 44.7 | 166 | 165 | 42.0 | 153 | 156 |
| | 1700 | 32.5 | 69.2 | 204 | 243 | 65.2 | 203 | 230 | 61.2 | 202 | 217 |
| | 1700 | 31.0 | 65.5 | 199 | 230 | 61.7 | 198 | 219 | 57.9 | 197 | 207 |
| | 1700 | 29.0 | 60.5 | 192 | 215 | 57.0 | 191 | 204 | 53.5 | 189 | 193 |
| | 1700 | 27.0 | 54.9 | 184 | 197 | 51.7 | 183 | 187 | 48.6 | 179 | 177 |
| | 1700 | 25.0 | 49.6 | 175 | 180 | 46.8 | 172 | 171 | 43.9 | 165 | 162 |
| | 1600 | 32.5 | 63.4 | 196 | 224 | 59.7 | 195 | 212 | 56.1 | 194 | 201 |
| | 1600 | 31.0 | 60.0 | 192 | 213 | 56.6 | 191 | 203 | 53.1 | 188 | 192 |
| | 1600 | 29.0 | 55.3 | 185 | 199 | 52.1 | 183 | 188 | 48.9 | 180 | 178 |
| | 1600 | 27.0 | 50.3 | 177 | 183 | 47.4 | 174 | 173 | 44.5 | 167 | 164 |

Figure 5-20 (Sheet 2 of 3)

**CRUISE PERFORMANCE
WITH RECOMMENDED LEAN MIXTURE**

5-35

NOTE:

- At 20,000 Feet, increase speed by 6 KTAS for each 1000 pounds below 7450 pounds.
- At 25,000 Feet, increase speed by 6 KTAS for each 1000 pounds below 7450 pounds.
- Operations at peak EGT may be utilized with power settings within the boxes if the airplane is equipped with the optional EGT system.

| ALTITUDE | RPM | MP | -45°C (-48°F) | | | -25°C (STD TEMP) (-12°F) | | | -5°C (24°F) | | |
|----------------|------|------|------------------|------------------|----------------|-----------------------------|-----------------------------|----------------|----------------|----------------|----------------|
| | | | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR | PERCENT BHP | KTAS | TOTAL LB/HR |
| 20,000 FEET | 1900 | 32.5 | 78.0 | 225 | 271 | 73.5 | 224 | 257 | 69.0 | 223 | 242 |
| | 1900 | 31.0 | 74.3 | 220 | 260 | 70.0 | 220 | 246 | 65.7 | 218 | 231 |
| | 1900 | 29.0 | 68.8 | 213 | 241 | 64.8 | 212 | 228 | 60.8 | 211 | 216 |
| | 1900 | 27.0 | 63.0 | 205 | 223 | 59.3 | 204 | 211 | 55.7 | 201 | 200 |
| | 1900 | 25.0 | 57.1 | 196 | 204 | 53.8 | 194 | 194 | 50.5 | 188 | 183 |
| | 1800 | 32.5 | 73.2 | 219 | 256 | 69.0 | 219 | 242 | 64.8 | 217 | 228 |
| | 1800 | 31.0 | 69.9 | 214 | 245 | 65.9 | 214 | 232 | 61.8 | 212 | 219 |
| | 1800 | 29.0 | 64.3 | 207 | 227 | 60.6 | 206 | 215 | 56.9 | 203 | 204 |
| | 1800 | 27.0 | 58.8 | 199 | 210 | 55.4 | 197 | 199 | 52.0 | 192 | 188 |
| | 1800 | 25.0 | 53.0 | 188 | 191 | 49.9 | 185 | 181 | 46.9 | 175 | 172 |
| | 1700 | 32.5 | 69.2 | 214 | 243 | 65.2 | 213 | 230 | 61.2 | 211 | 217 |
| | 1700 | 31.0 | 65.5 | 208 | 230 | 61.7 | 208 | 219 | 57.9 | 205 | 207 |
| | 1700 | 29.0 | 60.5 | 201 | 215 | 57.0 | 200 | 204 | 53.5 | 196 | 193 |
| | 1700 | 27.0 | 54.9 | 192 | 197 | 51.7 | 189 | 187 | 48.6 | 182 | 177 |
| | 1700 | 25.0 | 49.6 | 181 | 180 | 46.8 | 175 | 171 | --- | --- | --- |
| | 1600 | 31.0 | 60.0 | 200 | 213 | 56.6 | 199 | 203 | 53.1 | 195 | 192 |
| | 1600 | 29.0 | 55.3 | 193 | 199 | 52.1 | 190 | 188 | 48.9 | 183 | 178 |
| | | | | -54°C (-66°F) | | | -34°C (STD TEMP) (-30°F) | | | -14°C (6°F) | |
| 25,000 FEET | 1900 | 32.5 | 78.0 | 236 | 271 | 73.5 | 236 | 257 | 69.0 | 234 | 242 |
| | 1900 | 31.0 | 74.3 | 231 | 260 | 70.0 | 231 | 246 | 65.7 | 229 | 231 |
| | 1900 | 29.0 | 68.8 | 223 | 241 | 64.8 | 223 | 228 | 60.8 | 219 | 216 |
| | 1900 | 27.0 | 63.0 | 215 | 223 | 59.3 | 212 | 211 | 55.7 | 207 | 200 |
| | 1900 | 25.0 | 57.1 | 204 | 204 | 53.8 | 200 | 194 | 50.5 | 188 | 183 |
| | 1800 | 29.0 | 64.3 | 217 | 227 | 60.6 | 215 | 215 | 56.9 | 210 | 204 |
| | 1800 | 27.0 | 58.8 | 207 | 210 | 55.4 | 204 | 199 | 52.0 | 195 | 188 |
| | 1700 | 27.0 | 54.9 | 199 | 197 | 51.7 | 194 | 187 | --- | --- | --- |

Figure 5-20 (Sheet 3 of 3)

RANGE PROFILE

CONDITIONS:

1. Starting Weight - 7450 Pounds.
2. Cruise Climb to Desired Altitude.
3. Recommended Lean Fuel Flow.
4. Zero Wind.
5. Standard Day.

NOTE:

1. Range computations include fuel required for start, taxi, takeoff, cruise climb to altitude, cruise, descent and 45 minutes holding fuel at 45% power.
2. The distances shown are the sum of the distances to climb, cruise and descent.

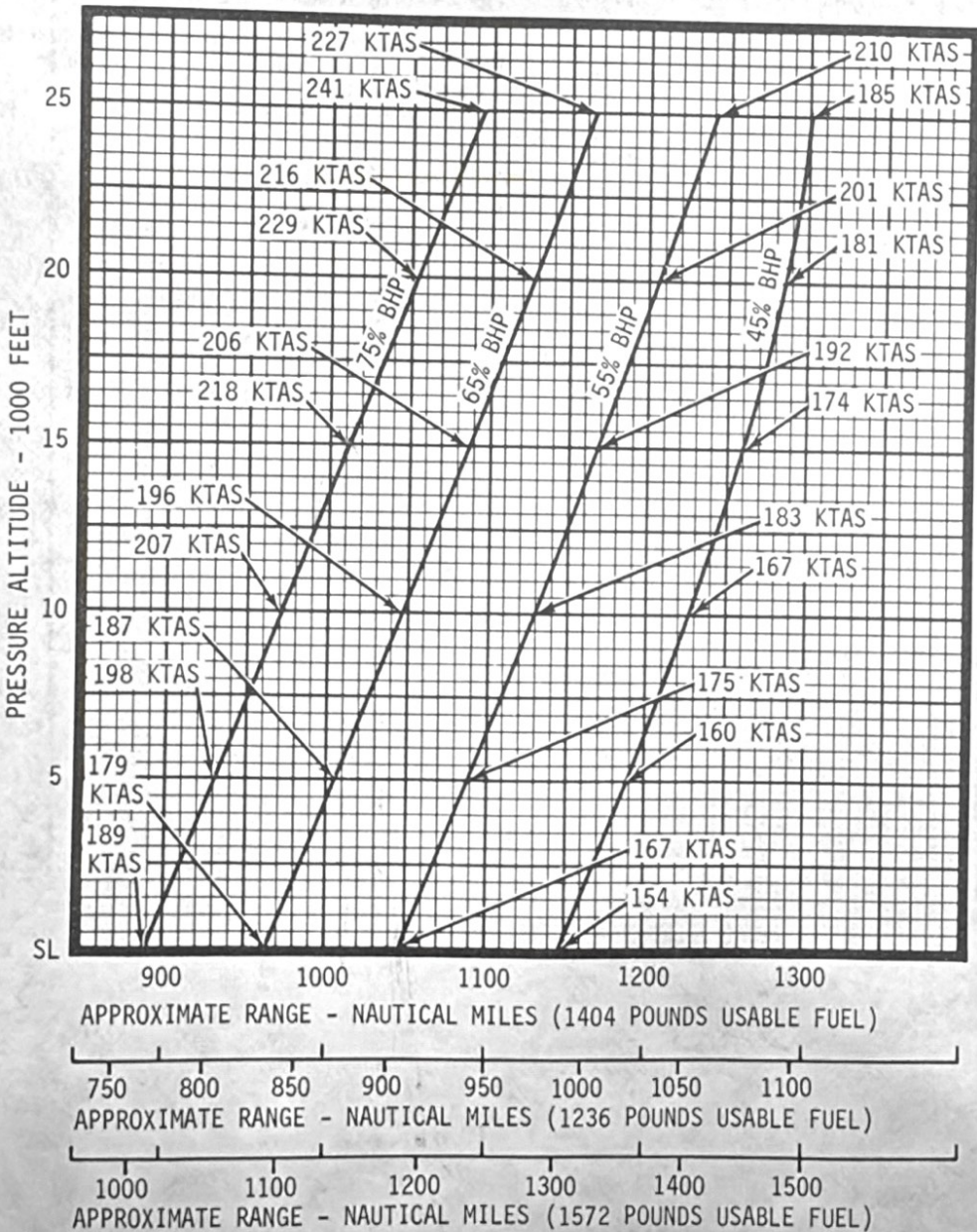
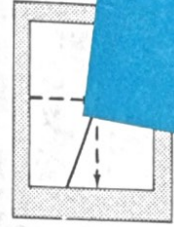


Figure 5-21

ENDURANCE PROFILE

CONDITIONS:

1. Starting Weight - 7450 Pounds.
2. Cruise Climb to Desired Altitude.
3. Recommended Lean Fuel Flow.
4. Standard Day.

NOTE:

1. Endurance computations include fuel required for start, taxi, takeoff, cruise climb to altitude, cruise, descent and 45 minutes holding fuel at 45% power.
2. The endurance shown is the sum of the times to climb, cruise and descend.

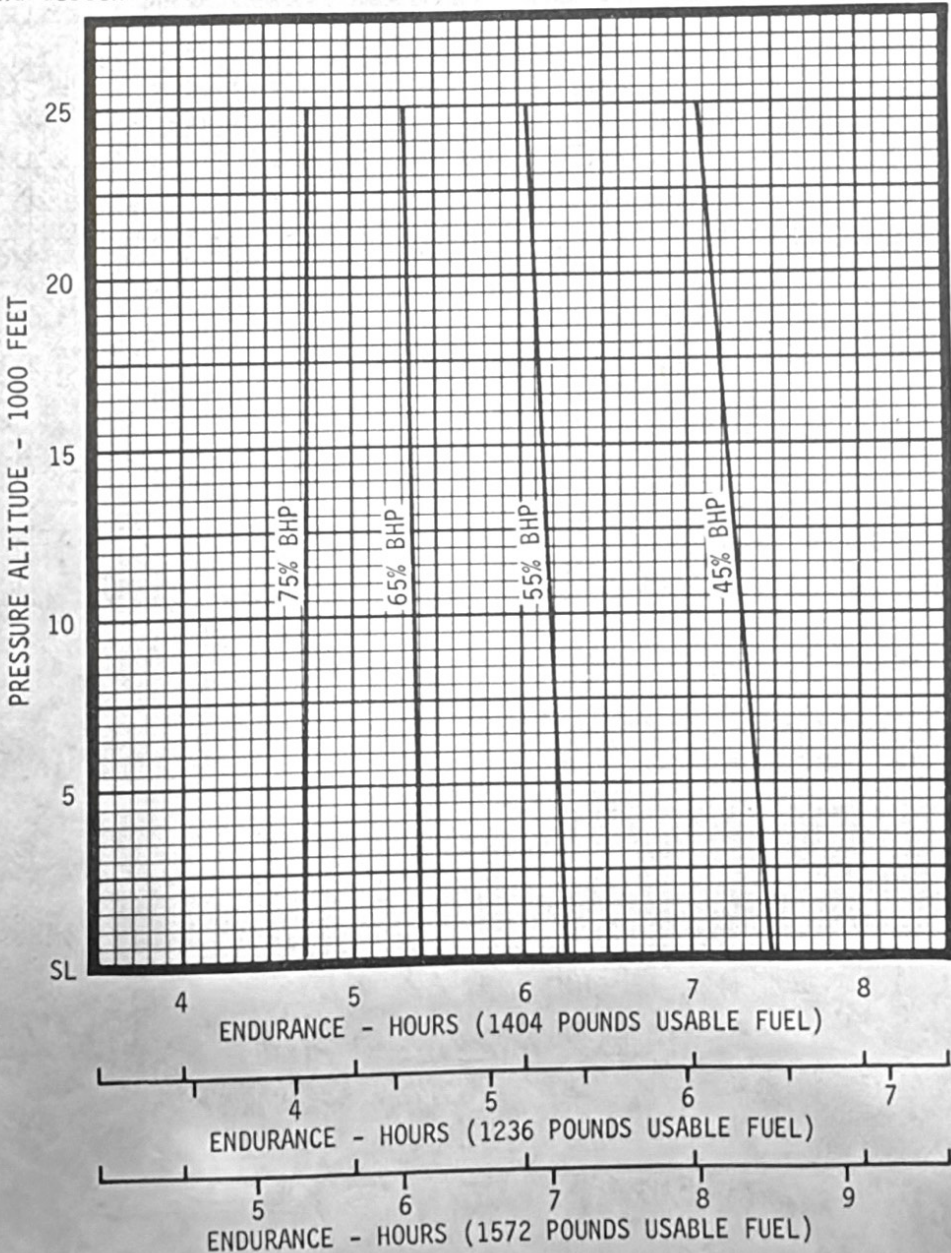
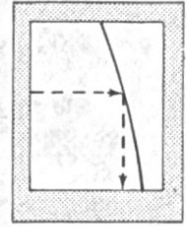


Figure 5-22

HOLDING TIME

CONDITIONS:

1. 1800 RPM and 23 Inches Hg. Manifold Pressure (45% Power).
2. Recommended Lean Fuel Flow (166 Pounds Per Hour Total).

$$166 \div 6 = 83$$

$$83 \div 6 = 13.8 \text{ GAL}$$

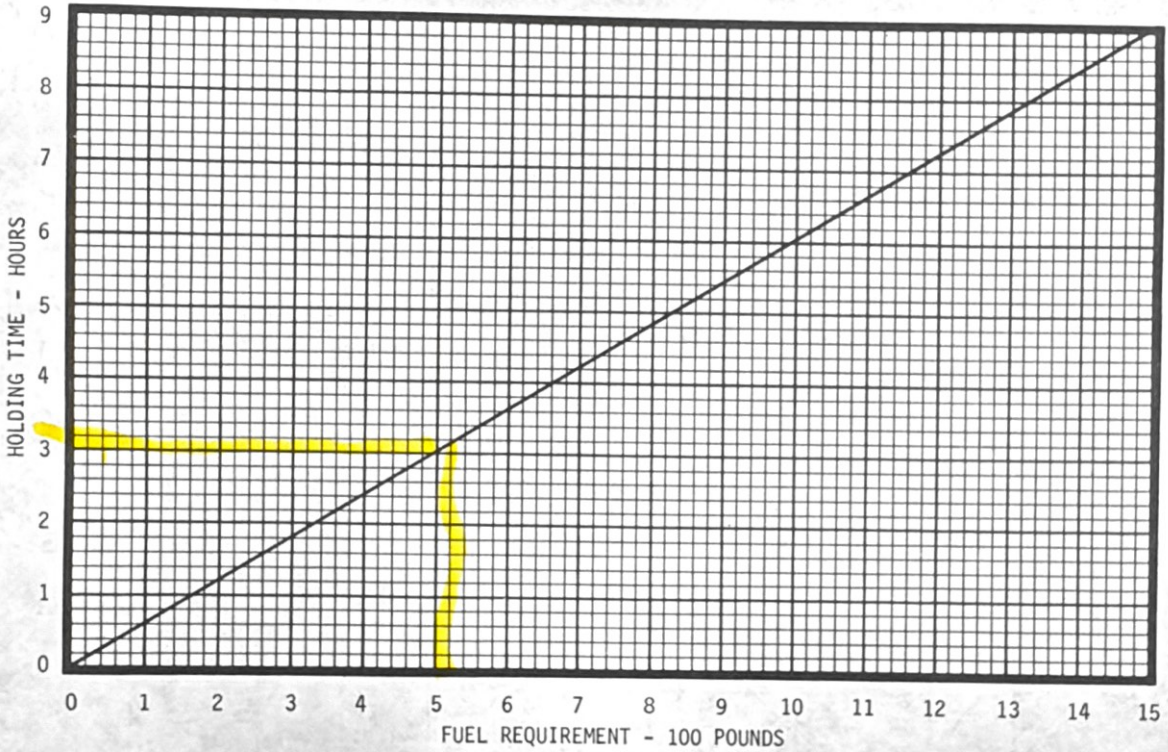
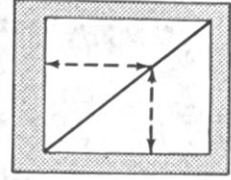


Figure 5-23

TIME, FUEL AND DISTANCE TO DESCEND

CONDITIONS:

1. Power - 1800 RPM and 23 Inches Hg. Manifold Pressure (45% Power).
2. Fuel Flow - RECOMMENDED LEAN (Approximately 83.0 Pounds Per Hour Per Engine).
3. Landing Gear - UP.
4. Wing Flaps - UP.
5. Airspeed - 180 KIAS.
6. Cowl Flaps - CLOSED (If Installed).

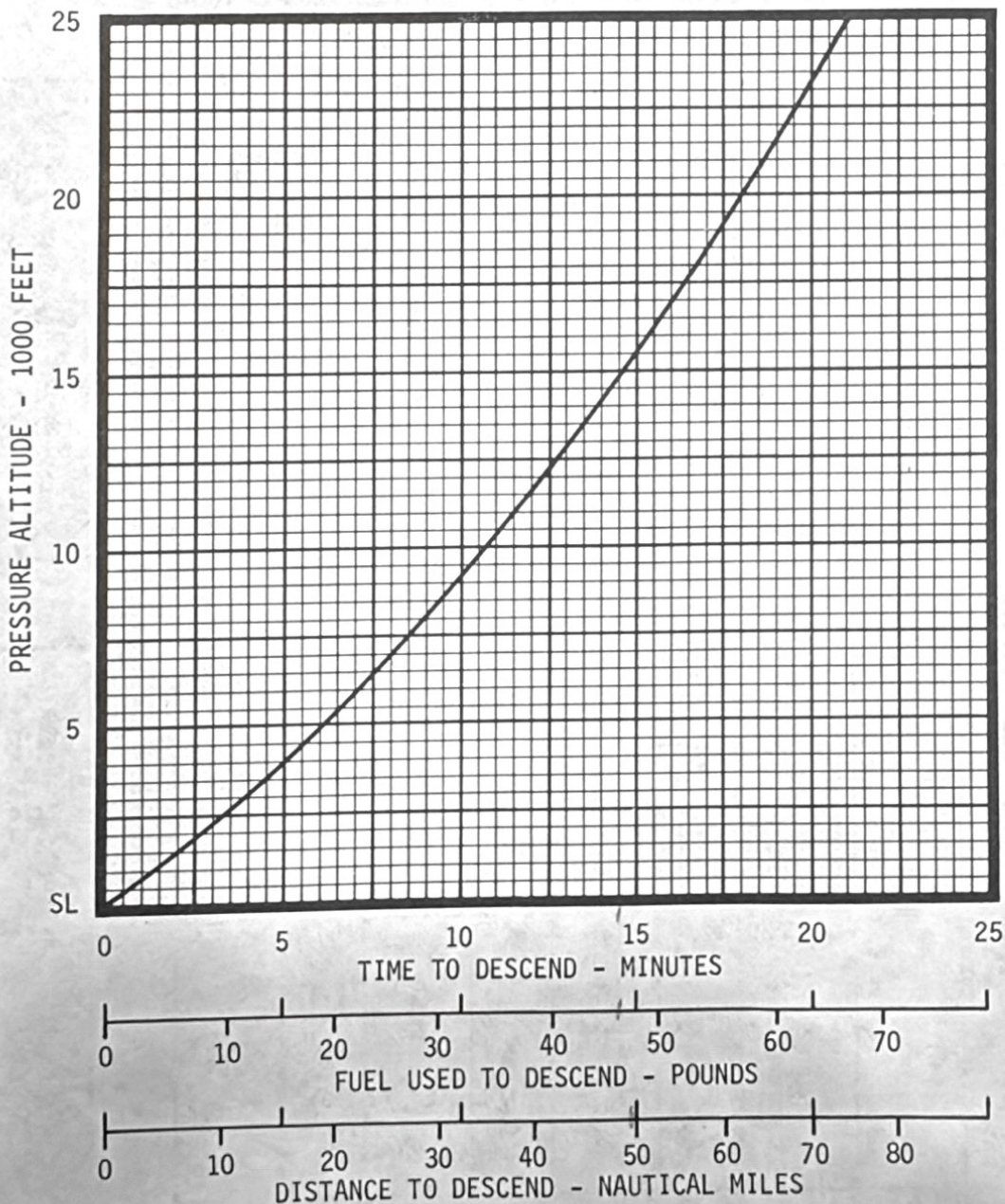
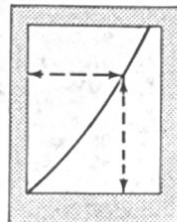


Figure 5-24

NORMAL LANDING DISTANCE

CONDITIONS:

1. Throttles - IDLE at 50 feet above ground level.
2. Landing Gear - DOWN.
3. Wing Flaps - 45°.
4. Cowl Flaps - AS REQUIRED (If Installed).
5. Touchdown - FULL STALL.
6. Level, Hard Surface Runway.
7. Maximum Effective Braking.

NOTE:

1. If necessary to land with wing flaps UP, the approach speed should be increased above the normal approach speed by 12 knots. Expect total landing distance to increase by 35%.
2. Decrease total distances by 3% for each 4 knots headwind. For operations with tailwinds up to 10 knots, increase total distances by 8% for each 3 knots wind.

| WEIGHT-POUNDS | SPEED AT 50-FOOT OBSTACLE KIAS | PRESSURE ALTITUDE - FEET | -20°C (-4°F) | | -10°C (14°F) | | 0°C (32°F) | | 10°C (50°F) | |
|---------------|--------------------------------|--------------------------|--------------------|--|--------------------|--|--------------------|--|--------------------|--|
| | | | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE |
| 7200 | 100 | Sea Level | 640 | 2210 | 660 | 2240 | 690 | 2260 | 710 | 2290 |
| | | 1000 | 660 | 2230 | 690 | 2260 | 710 | 2290 | 740 | 2310 |
| | | 2000 | 690 | 2260 | 710 | 2290 | 740 | 2310 | 770 | 2340 |
| | | 3000 | 710 | 2280 | 740 | 2310 | 770 | 2340 | 790 | 2370 |
| | | 4000 | 740 | 2310 | 770 | 2340 | 800 | 2370 | 820 | 2400 |
| | | 5000 | 770 | 2340 | 800 | 2370 | 830 | 2400 | 860 | 2430 |
| | | 6000 | 790 | 2370 | 830 | 2400 | 860 | 2430 | 890 | 2460 |
| | | 7000 | 820 | 2400 | 860 | 2430 | 890 | 2460 | 920 | 2490 |
| | | 8000 | 860 | 2430 | 890 | 2460 | 920 | 2500 | 960 | 2530 |
| | | 9000 | 890 | 2460 | 920 | 2500 | 960 | 2530 | 990 | 2570 |
| | | 10,000 | 920 | 2500 | 960 | 2530 | 1000 | 2570 | 1030 | 2610 |
| 6600 | 96 | Sea Level | 530 | 2100 | 550 | 2120 | 570 | 2140 | 590 | 2160 |
| | | 1000 | 550 | 2120 | 570 | 2140 | 590 | 2160 | 610 | 2180 |
| | | 2000 | 570 | 2140 | 590 | 2160 | 610 | 2180 | 630 | 2210 |
| | | 3000 | 590 | 2160 | 610 | 2180 | 630 | 2210 | 660 | 2230 |
| | | 4000 | 610 | 2180 | 630 | 2210 | 660 | 2230 | 680 | 2250 |
| | | 5000 | 630 | 2210 | 660 | 2230 | 680 | 2260 | 710 | 2280 |
| | | 6000 | 660 | 2230 | 680 | 2260 | 710 | 2280 | 730 | 2310 |
| | | 7000 | 680 | 2250 | 710 | 2280 | 740 | 2310 | 760 | 2340 |
| | | 8000 | 710 | 2280 | 740 | 2310 | 760 | 2340 | 790 | 2360 |
| | | 9000 | 740 | 2310 | 760 | 2340 | 790 | 2370 | 820 | 2400 |
| | | 10,000 | 760 | 2340 | 790 | 2370 | 820 | 2400 | 850 | 2430 |
| 6000 | 91 | Sea Level | 430 | 2000 | 450 | 2020 | 460 | 2040 | 480 | 2050 |
| | | 1000 | 440 | 2020 | 460 | 2030 | 480 | 2050 | 500 | 2070 |
| | | 2000 | 460 | 2030 | 480 | 2050 | 500 | 2070 | 510 | 2090 |
| | | 3000 | 480 | 2050 | 500 | 2070 | 510 | 2090 | 530 | 2110 |
| | | 4000 | 500 | 2070 | 510 | 2090 | 530 | 2110 | 550 | 2130 |
| | | 5000 | 510 | 2090 | 530 | 2110 | 550 | 2130 | 570 | 2150 |
| | | 6000 | 530 | 2110 | 550 | 2130 | 580 | 2150 | 600 | 2170 |
| | | 7000 | 550 | 2130 | 580 | 2150 | 600 | 2170 | 620 | 2190 |
| | | 8000 | 580 | 2150 | 600 | 2170 | 620 | 2190 | 640 | 2220 |
| | | 9000 | 600 | 2170 | 620 | 2190 | 640 | 2220 | 670 | 2240 |
| | | 10,000 | 620 | 2190 | 650 | 2220 | 670 | 2240 | 690 | 2270 |
| 5400 | 86 | Sea Level | 340 | 1910 | 350 | 1930 | 370 | 1940 | 380 | 1950 |
| | | 1000 | 350 | 1930 | 370 | 1940 | 380 | 1950 | 390 | 1970 |
| | | 2000 | 370 | 1940 | 380 | 1950 | 390 | 1970 | 410 | 1980 |
| | | 3000 | 380 | 1950 | 390 | 1970 | 410 | 1980 | 420 | 2000 |
| | | 4000 | 390 | 1970 | 410 | 1980 | 420 | 2000 | 440 | 2010 |
| | | 5000 | 410 | 1980 | 420 | 2000 | 440 | 2010 | 460 | 2030 |
| | | 6000 | 420 | 2000 | 440 | 2010 | 460 | 2030 | 470 | 2050 |
| | | 7000 | 440 | 2010 | 460 | 2030 | 470 | 2050 | 490 | 2060 |
| | | 8000 | 460 | 2030 | 480 | 2050 | 490 | 2070 | 510 | 2080 |
| | | 9000 | 470 | 2050 | 490 | 2070 | 510 | 2090 | 530 | 2100 |
| | | 10,000 | 490 | 2070 | 510 | 2090 | 530 | 2110 | 550 | 2120 |

Figure 5-25 (Sheet 1 of 2)

NORMAL LANDING DISTANCE

CONDITIONS:

1. Throttles - IDLE at 50 feet above ground level.
2. Landing Gear - DOWN.
3. Wing Flaps - 45°.
4. Cowl Flaps - AS REQUIRED (If Installed).
5. Touchdown - FULL STALL.
6. Level, Hard Surface Runway.
7. Maximum Effective Braking.

NOTE:

1. If necessary to land with wing flaps UP, the approach speed should be increased above the normal approach speed by 12 knots. Expect total landing distance to increase by 35%.
2. Decrease total distances by 3% for each 4 knots headwind. For operations with tailwinds up to 10 knots, increase total distances by 8% for each 3 knots wind.

| WEIGHT-POUNDS | SPEED AT 50-FOOT OBSTACLE KIAS | PRESSURE ALTITUDE - FEET | 20°C (68°F) | | 30°C (86°F) | | 40°C (104°F) | |
|---------------|--------------------------------|--------------------------|--------------------|--|--------------------|--|--------------------|--|
| | | | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE | GROUND ROLL - FEET | TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE |
| 7200 | 100 | Sea Level | 740 | 2310 | 760 | 2340 | 790 | 2360 |
| | | 1000 | 760 | 2340 | 790 | 2360 | 820 | 2390 |
| | | 2000 | 790 | 2370 | 820 | 2390 | 850 | 2420 |
| | | 3000 | 820 | 2400 | 850 | 2420 | 880 | 2450 |
| | | 4000 | 850 | 2430 | 880 | 2460 | 910 | 2480 |
| | | 5000 | 890 | 2460 | 920 | 2490 | 950 | 2520 |
| | | 6000 | 920 | 2490 | 950 | 2520 | 980 | 2550 |
| | | 7000 | 950 | 2530 | 990 | 2560 | 1020 | 2590 |
| | | 8000 | 990 | 2560 | 1020 | 2600 | 1060 | 2630 |
| | | 9000 | 1030 | 2600 | 1060 | 2640 | 1100 | 2670 |
| | | 10,000 | 1070 | 2640 | 1110 | 2680 | 1140 | 2720 |
| 6600 | 96 | Sea Level | 610 | 2180 | 630 | 2200 | 650 | 2220 |
| | | 1000 | 630 | 2210 | 650 | 2230 | 680 | 2250 |
| | | 2000 | 660 | 2230 | 680 | 2250 | 700 | 2270 |
| | | 3000 | 680 | 2250 | 700 | 2280 | 730 | 2300 |
| | | 4000 | 710 | 2280 | 730 | 2300 | 750 | 2330 |
| | | 5000 | 730 | 2300 | 760 | 2330 | 780 | 2350 |
| | | 6000 | 760 | 2330 | 790 | 2360 | 810 | 2380 |
| | | 7000 | 790 | 2360 | 820 | 2390 | 840 | 2420 |
| | | 8000 | 820 | 2390 | 850 | 2420 | 870 | 2450 |
| | | 9000 | 850 | 2420 | 880 | 2450 | 910 | 2480 |
| | | 10,000 | 880 | 2460 | 910 | 2490 | 940 | 2520 |
| 6000 | 91 | Sea Level | 500 | 2070 | 510 | 2090 | 530 | 2100 |
| | | 1000 | 510 | 2090 | 530 | 2100 | 550 | 2120 |
| | | 2000 | 530 | 2110 | 550 | 2120 | 570 | 2140 |
| | | 3000 | 550 | 2130 | 570 | 2140 | 590 | 2160 |
| | | 4000 | 570 | 2150 | 590 | 2170 | 610 | 2180 |
| | | 5000 | 590 | 2170 | 610 | 2190 | 630 | 2210 |
| | | 6000 | 620 | 2190 | 640 | 2210 | 660 | 2230 |
| | | 7000 | 640 | 2210 | 660 | 2240 | 680 | 2260 |
| | | 8000 | 670 | 2240 | 690 | 2260 | 710 | 2280 |
| | | 9000 | 690 | 2260 | 710 | 2290 | 740 | 2310 |
| | | 10,000 | 720 | 2290 | 740 | 2320 | 770 | 2340 |
| 5400 | 86 | Sea Level | 390 | 1970 | 410 | 1980 | 420 | 1990 |
| | | 1000 | 410 | 1980 | 420 | 2000 | 440 | 2010 |
| | | 2000 | 420 | 2000 | 440 | 2010 | 450 | 2020 |
| | | 3000 | 440 | 2010 | 450 | 2030 | 470 | 2040 |
| | | 4000 | 460 | 2030 | 470 | 2040 | 490 | 2060 |
| | | 5000 | 470 | 2050 | 490 | 2060 | 500 | 2080 |
| | | 6000 | 490 | 2060 | 510 | 2080 | 520 | 2100 |
| | | 7000 | 510 | 2080 | 530 | 2100 | 540 | 2120 |
| | | 8000 | 530 | 2100 | 550 | 2120 | 560 | 2140 |
| | | 9000 | 550 | 2120 | 570 | 2140 | 590 | 2160 |
| | | 10,000 | 570 | 2140 | 590 | 2160 | 610 | 2180 |

Figure 5-25 (Sheet 2 of 2)