# N65518 - C172P

Fact Book

## AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in figure 2-1. Maneuvering speeds shown apply to normal category operations. The utility category maneuvering speed is 102 KIAS at 2100 pounds.

| | SPEED | KCAS | KIAS | REMARKS |
|---|---|---|---|---|
| $V_{NE}$ | Never Exceed Speed | 152 | 158 | Do not exceed this speed in any operation. |
| $V_{NO}$ | Maximum Structural Cruising Speed | 123 | 127 | Do not exceed this speed except in smooth air, and then only with caution. |
| $V_A$ | Maneuvering Speed:<br>2400 Pounds<br>2000 Pounds<br>1600 Pounds | <br>97<br>91<br>81 | <br>99<br>92<br>82 | Do not make full or abrupt control movements above this speed. |
| $V_{FE}$ | Maximum Flap Extended Speed:<br>$10^o$ Flaps<br>$10^o$ - $30^o$ Flaps | <br>108<br>84 | <br>110<br>85 | Do not exceed this speed with flaps down. |
| | Maximum Window Open Speed | 152 | 158 | Do not exceed this speed with windows open. |

Figure 2-1. Airspeed Limitations

## AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings and their color code significance are shown in figure 2-2.





| MARKING | KIAS VALUE OR RANGE | SIGNIFICANCE |
|---|---|---|
| White Arc | 33 - 85 | Full Flap Operating Range. Lower limit is maximum weight $V_{S_0}$ in landing configuration. Upper limit is maximum speed permissible with flaps extended. |
| Green Arc | 44 - 127 | Normal Operating Range. Lower limit is maximum weight $V_S$ at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed. |
| Yellow Arc | 127 - 158 | Operations must be conducted with caution and only in smooth air. |
| Red Line | 158 | Maximum speed for all operations. |

Figure 2-2. Airspeed Indicator Markings

## POWER PLANT LIMITATIONS

Engine Manufacturer: Avco Lycoming.
Engine Model Number: O-320-D2J.
Maximum Power: 160 BHP rating.
Engine Operating Limits for Takeoff and Continuous Operations:
Maximum Engine Speed: 2700 RPM.

NOTE

The static RPM range at full throttle (carburetor heat off and mixture leaned to maximum RPM) is 2300 to 2420 RPM.

Maximum Oil Temperature: 245°F (118°C).
Oil Pressure, Minimum: 25 psi.
Maximum: 115 psi.
Fuel Grade: See Fuel Limitations.
Oil Grade (Specification):
MIL-L-6082 Aviation Grade Straight Mineral Oil or MIL-L-22851 Ashless Dispersant Oil.
Propeller Manufacturer: McCauley Accessory Division.
Propeller Model Number: 1C160/DTM7557.
Propeller Diameter, Maximum: 75 inches.
Minimum: 74 inches.

## 'ER PLANT INSTRUMENT MARKINGS

wer plant instrument markings and their color code significance own in figure 2-3.

| TRUMENT | RED LINE MINIMUM LIMIT | GREEN ARC NORMAL OPERATING | RED LINE MAXIMUM LIMIT |
|---|---|---|---|
| hometer:<br>ea Level<br>000 Feet<br>0000 Feet | --- | 2100-2450 RPM<br>2100-2575 RPM<br>2100-2700 RPM | 2700 RPM |
| Temperature | --- | 100°-245°F | 245°F |
| Pressure | 25 psi | 60-90 psi | 115 psi |
| l Quantity<br>ındard<br>anks) | E<br>(1.5 Gal. Unusable Each Tank) | --- | --- |
| l Quantity<br>ng Range<br>anks) | E<br>(2.0 Gal. Unusable Each Tank) | --- | --- |
| l Quantity<br>egral<br>Tanks) | E<br>(3.0 Gal. Unusable Each Tank) | --- | --- |
| tion | --- | 4.5-5.4 in. Hg | --- |

Figure 2-3. Power Plant Instrument Markings

## GHT LIMITS

### MAL CATEGORY

num Ramp Weight: 2407 lbs.
num Takeoff Weight: 2400 lbs.
num Landing Weight: 2400 lbs.
num Weight in Baggage Compartment:
aggage Area 1 (or passenger on child's seat) - Station 82 to 108: 120 lbs. See following note.
aggage Area 2 - Station 108 to 142: 50 lbs. See following note.





NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 120 lbs.

### UTILITY CATEGORY

Maximum Ramp Weight: 2107 lbs.
Maximum Takeoff Weight: 2100 lbs.
Maximum Landing Weight: 2100 lbs.
Maximum Weight in Baggage Compartment: In the utility category, the baggage compartment and rear seat must not be occupied.

## CENTER OF GRAVITY LIMITS

### NORMAL CATEGORY

Center of Gravity Range:
Forward: 35.0 inches aft of datum at 1950 lbs. or less, with straight line variation to 39.5 inches aft of datum at 2400 lbs.
Aft: 47.3 inches aft of datum at all weights.
Reference Datum: Lower portion of front face of firewall.

### UTILITY CATEGORY

Center of Gravity Range:
Forward: 35.0 inches aft of datum at 1950 lbs. or less, with straight line variation to 36.5 inches aft of datum at 2100 lbs.
Aft: 40.5 inches aft of datum at all weights.
Reference Datum: Lower portion of front face of firewall.

## MANEUVER LIMITS

### NORMAL CATEGORY

This airplane is certificated in both the normal and utility category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and turns in which the angle of bank is not more than 60°. Aerobatic maneuvers, including spins, are not approved.

### UTILITY CATEGORY

This airplane is not designed for purely aerobatic flight. However, in the acquisition of various certificates such as commercial pilot and flight

structor, certain maneuvers are required by the FAA. All of these aneuvers are permitted in this airplane when operated in the utility tegory.

In the utility category, the baggage compartment and rear seat must t be occupied. No aerobatic maneuvers are approved except those listed low:

| MANEUVER | RECOMMENDED ENTRY SPEED* |
|---|---|
| Chandelles | 105 knots |
| Lazy Eights | 105 knots |
| Steep Turns | 95 knots |
| Spins | Slow Deceleration |
| Stalls (Except Whip Stalls) | Slow Deceleration |

*Abrupt use of the controls is prohibited above 99 knots.

Aerobatics that may impose high loads should not be attempted. The portant thing to bear in mind in flight maneuvers is that the airplane is an in aerodynamic design and will build up speed quickly with the nose wn. Proper speed control is an essential requirement for execution of maneuver, and care should always be exercised to avoid excessive ed which in turn can impose excessive loads. In the execution of all neuvers, avoid abrupt use of controls. Intentional spins with flaps nded are prohibited.

## GHT LOAD FACTOR LIMITS

### RMAL CATEGORY

ht Load Factors (Maximum Takeoff Weight - 2400 lbs.):
Flaps Up . . . . . +3.8g, -1.52g
Flaps Down . . . . . +3.0g

The design load factors are 150% of the above, and in all cases, the tructure meets or exceeds design loads.

### ITY CATEGORY

t Load Factors (Maximum Takeoff Weight - 2100 lbs.):
Flaps Up . . . . . +4.4g, -1.76g
Flaps Down . . . . . +3.0g

The design load factors are 150% of the above, and in all cases, the ructure meets or exceeds design loads.





## KINDS OF OPERATION LIMITS

The airplane is equipped for day VFR and may be equipped for night VFR and/or IFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operating limitations placard reflects equipment installed at the time of Airworthiness Certificate issuance.

Flight into known icing conditions is prohibited.

## FUEL LIMITATIONS

2 Standard Tanks: 21.5 U.S. gallons each.
Total Fuel: 43 U.S. gallons.
Usable Fuel (all flight conditions): 40 U.S. gallons.
Unusable Fuel: 3 U.S. gallons.
2 Long Range Tanks: 27 U.S. gallons each.
Total Fuel: 54 U.S. gallons.
Usable Fuel (all flight conditions): 50 U.S. gallons.
Unusable Fuel: 4 U.S. gallons.
2 Integral Tanks: 34 U.S. gallons each.
Total Fuel: 68 U.S. gallons.
Usable Fuel (all flight conditions): 62 U.S. gallons.
Unusable Fuel: 6 U.S. gallons.

NOTE

To ensure maximum fuel capacity when refueling and minimize cross-feeding when parked on a sloping surface, place the fuel selector valve in either LEFT or RIGHT position.

Takeoff and land with the fuel selector valve handle in the BOTH position.

Maximum slip or skid duration with one tank dry: 30 seconds.

With 1/4 tank or less, prolonged uncoordinated flight is prohibited when operating on either left or right tank in level flight.

Fuel remaining in the tank after the fuel quantity indicator reads empty (red line) cannot be safely used in flight.

Approved Fuel Grades (and Colors):
100LL Grade Aviation Fuel (Blue).
100 (Formerly 100/130) Grade Aviation Fuel (Green).

3. Near fuel tank filler cap (standard tanks):

FUEL
100LL/100 MIN. GRADE AVIATION GASOLINE
CAP. 21.5 U.S. GAL.

Near fuel tank filler cap (long range tanks):

FUEL
100LL/100 MIN. GRADE AVIATION GASOLINE
CAP. 27 U.S. GAL.

Near fuel tank filler cap (integral tanks):

FUEL
100LL/100 MIN. GRADE AVIATION GASOLINE
CAP. 34 U.S. GAL.
CAP. 24.0 U.S. GAL. TO BOTTOM OF FILLER COLLAR

4. Near wing flap switch:

AVOID SLIPS WITH FLAPS EXTENDED

5. On flap control indicator:

| | |
|---|---|
| 0° to 10° | (Partial flap range with blue color code and 110 kt callout; also, mechanical detent at 10°.) |
| 10° to 30° | (Indices at these positions with white color code and 85 kt callout; also, mechanical detent at 10° and 20°.) |





6. In baggage compartment:

120 POUNDS MAXIMUM
BAGGAGE AND/OR AUXILIARY PASSENGER
FORWARD OF BAGGAGE DOOR LATCH

50 POUNDS MAXIMUM
BAGGAGE AFT OF BAGGAGE DOOR LATCH

MAXIMUM 120 POUNDS COMBINED

FOR ADDITIONAL LOADING INSTRUCTIONS
SEE WEIGHT AND BALANCE DATA

7. A calibration card must be provided to indicate the accuracy of the magnetic compass in 30° increments.

8. On oil filler cap:

OIL
7 QTS

9. On control lock:

CAUTION!
CONTROL LOCK
REMOVE BEFORE STARTING ENGINE

10. Near airspeed indicator:

MANEUVER SPEED - 99 KIAS

## BLE OF CONTENTS (Continued)







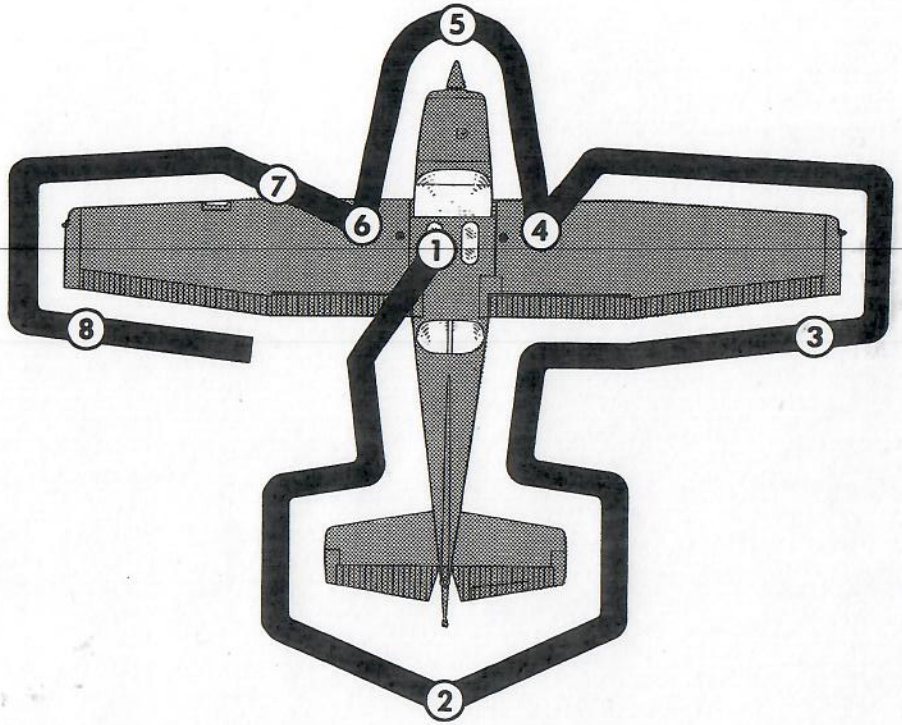
## INTRODUCTION

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 weight of 2400 pounds 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 10°, Speed at 50 Feet | 56 KIAS |
| Enroute Climb, Flaps Up: | |
| Normal, Sea Level | 75-85 KIAS |
| Normal, 10,000 Feet | 70-80 KIAS |
| Best Rate of Climb, Sea Level | 76 KIAS |
| Best Rate of Climb, 10,000 Feet | 71 KIAS |
| Best Angle of Climb, Sea Level | 60 KIAS |
| Best Angle of Climb, 10,000 Feet | 65 KIAS |
| Landing Approach: | |
| Normal Approach, Flaps Up | 65-75 KIAS |
| Normal Approach, Flaps 30° | 60-70 KIAS |
| Short Field Approach, Flaps 30° | 61 KIAS |
| Balked Landing: | |
| Maximum Power, Flaps 20° | 55 KIAS |
| Maximum Recommended Turbulent Air Penetration Speed: | |
| 2400 Lbs | 99 KIAS |
| 2000 Lbs | 92 KIAS |
| 1600 Lbs | 82 KIAS |
| Maximum Demonstrated Crosswind Velocity: | |
| Takeoff or Landing | 15 KNOTS |




NOTE

Visually check airplane for general condition during walk-around inspection. Use of the refueling steps and assist handles (if installed) will simplify access to the upper wing surfaces for visual checks and refueling operations. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater (if installed) is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.

Figure 4-1. Preflight Inspection





# CHECKLIST PROCEDURES

## PREFLIGHT INSPECTION

### (1) CABIN

1. Pilot's Operating Handbook -- AVAILABLE IN THE AIRPLANE.
2. Parking Brake -- SET.
3. Control Wheel Lock -- REMOVE.
4. Ignition Switch -- OFF.
5. Avionics Power Switch -- OFF.
6. Master Switch -- ON.

**WARNING**

When turning on the master switch, using an external power source, or pulling the propeller through by hand, treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire or a component malfunction could cause the propeller to rotate.

7. Fuel Quantity Indicators -- CHECK QUANTITY.
8. Avionics Cooling Fan -- CHECK AUDIBLY FOR OPERATION.
9. Master Switch -- OFF.
10. Static Pressure Alternate Source Valve (if installed) -- OFF.
11. Fuel Selector Valve -- BOTH.
12. Baggage Door -- CHECK, lock with key if child's seat is to be occupied.

### (2) EMPENNAGE

1. Rudder Gust Lock -- REMOVE.
2. Tail Tie-Down -- DISCONNECT.
3. Control Surfaces -- CHECK freedom of movement and security.

### (3) RIGHT WING Trailing Edge

1. Aileron -- CHECK freedom of movement and security.

### (4) RIGHT WING

1. Wing Tie-Down -- DISCONNECT.
2. Main Wheel Tire -- CHECK for proper inflation.

3. Fuel Tank Sump Quick-Drain Valve -- DRAIN fuel (using sampler cup) to check for water, sediment, and proper fuel grade before first flight of day and after each refueling. If water is observed, take further samples until there is no evidence of water contamination.
4. Fuel Selector Quick-Drain Valve (located on bottom of fuselage) -- DRAIN fuel (using sampler cup) to check for water, sediment, and proper fuel grade before first flight of day and after each refueling. If water is observed, take further samples until there is no evidence of water contamination.
5. Fuel Quantity -- CHECK VISUALLY for desired level.
6. Fuel Filler Cap -- SECURE.

### (5) NOSE

1. Engine Oil Dipstick/Filler Cap -- CHECK oil level, then check dipstick/filler cap SECURE. Do not operate with less than five quarts. Fill to seven quarts for extended flight.
2. Fuel Strainer Drain Knob -- PULL OUT for about four seconds to clear strainer of possible water and sediment before first flight of day and after each refueling. Return drain knob full in and check strainer drain CLOSED. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel tank sumps, and fuel selector quick-drain valve must be accomplished,
3. Propeller and Spinner -- CHECK for nicks and security.
4. Carburetor Air Filter -- CHECK for restrictions by dust or other foreign matter.
5. Nose Wheel Strut and Tire -- CHECK for proper inflation.
6. Nose Tie-Down -- DISCONNECT.
7. Static Source Opening (left side of fuselage) -- CHECK for stoppage.

### (6) LEFT WING

1. Main Wheel Tire -- CHECK for proper inflation.
2. Fuel Tank Sump Quick-Drain Valve -- DRAIN fuel (using sampler cup) to check for water, sediment, and proper fuel grade before first flight of day and after each refueling. If water is observed, take further samples until there is no evidence of water contamination.
3. Fuel Quantity -- CHECK VISUALLY for desired level.
4. Fuel Filler Cap -- SECURE.

### (7) LEFT WING Leading Edge

1. Pitot Tube Cover -- REMOVE and check opening for stoppage.
2. Fuel Tank Vent Opening -- CHECK for stoppage.





3. Stall Warning Opening -- CHECK for stoppage. To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.
4. Wing Tie-Down -- DISCONNECT.
5. Landing Light(s) -- CHECK for condition and cleanliness of cover.

### (8) LEFT WING Trailing Edge

1. Aileron -- CHECK for freedom of movement and security.

## BEFORE STARTING ENGINE

1. Preflight Inspection -- COMPLETE.
2. Passenger Briefing -- COMPLETE.
3. Seats, Seat Belts, Shoulder Harnesses -- ADJUST and LOCK.
4. Brakes -- TEST and SET.
5. Avionics Power Switch -- OFF.

**CAUTION**

The avionics power switch must be OFF during engine start to prevent possible damage to avionics.

6. Circuit Breakers -- CHECK IN.
7. Electrical Equipment, Autopilot (if installed) -- OFF.
8. Fuel Selector Valve -- BOTH.

## STARTING ENGINE

1. Prime -- AS REQUIRED (2 to 6 strokes; none if engine is warm).
2. Carburetor Heat -- COLD.
3. Throttle -- OPEN 1/8 INCH.
4. Mixture -- RICH.
5. Propeller Area -- CLEAR.
6. Master Switch -- ON.
7. Ignition Switch -- START (release when engine starts).
8. Oil Pressure -- CHECK.
9. Avionics Power Switch -- ON.
10. Navigation Lights and Flashing Beacon -- ON as required.
11. Radios -- ON.

## ORE TAKEOFF

- Parking Brake -- SET.
- Seats, Seat Belts, Shoulder Harnesses -- CHECK SECURE.
- Cabin Doors -- CLOSED and LOCKED.
- Flight Controls -- FREE and CORRECT.
- Flight Instruments -- CHECK and SET.
- Fuel Quantity -- CHECK.
- Mixture -- RICH.
- Fuel Selector Valve -- RECHECK BOTH.

Elevator Trim and Rudder Trim (if installed) -- SET for takeoff.
Throttle -- 1700 RPM.

a. Magnetos -- CHECK (RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between magnetos).
b. Carburetor Heat -- CHECK (for RPM drop).
c. Suction Gage -- CHECK.
d. Engine Instruments and Ammeter -- CHECK.

Throttle -- 1000 RPM or LESS.
Throttle Friction Lock -- ADJUST.
Strobe Lights (if installed) -- AS DESIRED.
Radios and Avionics -- SET.
Autopilot (if installed) -- OFF.
Air Conditioner (if installed) -- OFF.
Wing Flaps -- SET for takeoff (see Takeoff checklists).
Brakes -- RELEASE.

## EOFF

### MAL TAKEOFF

Wing Flaps -- 0° - 10°.
Carburetor Heat -- COLD.
Throttle -- FULL OPEN.
Elevator Control -- LIFT NOSE WHEEL (at 55 KIAS).
Climb Speed -- 70-80 KIAS.

### RT FIELD TAKEOFF

Wing Flaps -- 10°.
Carburetor Heat -- COLD.
Brakes -- APPLY.
Throttle -- FULL OPEN.
Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
Brakes -- RELEASE.
Elevator Control -- SLIGHTLY TAIL LOW.
Climb Speed -- 56 KIAS (until all obstacles are cleared).





## ENROUTE CLIMB

1. Airspeed -- 70-85 KIAS.

NOTE

If a maximum performance climb is necessary, use speeds shown in the Rate Of Climb chart in Section 5.

2. Throttle -- FULL OPEN.
3. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).

## CRUISE

1. Power -- 2100-2700 RPM (no more than 75% is recommended).
2. Elevator and Rudder Trim (if installed) -- ADJUST.
3. Mixture -- LEAN.

## DESCENT

1. Fuel Selector Valve -- BOTH.
2. Power -- AS DESIRED.
3. Mixture -- ADJUST for smooth operation (full rich for idle power).
4. Carburetor Heat -- FULL HEAT AS REQUIRED (to prevent carburetor icing).

## BEFORE LANDING

1. Seats, Seat Belts, Shoulder Harnesses -- SECURE.
2. Fuel Selector Valve -- BOTH.
3. Mixture -- RICH.
4. Carburetor Heat -- ON (apply full heat before reducing power).
5. Autopilot (if installed) -- OFF.
6. Air Conditioner (if installed) -- OFF.

## LANDING

### NORMAL LANDING

1. Airspeed -- 65-75 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (0°-10° below 110 KIAS, 10°-30° below 85 KIAS).
3. Airspeed -- 60-70 KIAS (flaps DOWN).

4. Touchdown -- MAIN WHEELS FIRST.
5. Landing Roll -- LOWER NOSE WHEEL GENTLY.
6. Braking -- MINIMUM REQUIRED.

### SHORT FIELD LANDING

1. Airspeed -- 65-75 KIAS (flaps UP).
2. Wing Flaps -- FULL DOWN (30°).
3. Airspeed -- 61 KIAS (until flare).
4. Power -- REDUCE to idle after clearing obstacle.
5. Touchdown -- MAIN WHEELS FIRST.
6. Brakes -- APPLY HEAVILY.
7. Wing Flaps -- RETRACT.

### BALKED LANDING

1. Throttle -- FULL OPEN.
2. Carburetor Heat -- COLD.
3. Wing Flaps -- 20° (immediately).
4. Climb Speed -- 55 KIAS.
5. Wing Flaps -- 10° (until obstacles are cleared).
   RETRACT (after reaching a safe altitude and 60 KIAS).

## AFTER LANDING

1. Carburetor Heat -- COLD.
2. Wing Flaps -- UP.

## SECURING AIRPLANE

1. Parking Brake -- SET.
2. Avionics Power Switch, Electrical Equipment, Autopilot (if installed) -- OFF.
3. Mixture -- IDLE CUT-OFF (pulled full out).
4. Ignition Switch -- OFF.
5. Master Switch -- OFF.
6. Control Lock -- INSTALL.

# AIRSPEED CALIBRATION

## NORMAL STATIC SOURCE

CONDITION:
Power required for level flight or maximum rated RPM dive.

| FLAPS UP | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KIAS | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 |
| KCAS | 56 | 62 | 70 | 79 | 89 | 98 | 107 | 117 | 126 | 135 | 145 | 154 |
| FLAPS 10° | | | | | | | | | | | | |
| KIAS | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | --- | --- | --- | --- |
| KCAS | 49 | 55 | 62 | 70 | 79 | 89 | 98 | 108 | --- | --- | --- | --- |
| FLAPS 30° | | | | | | | | | | | | |
| KIAS | 40 | 50 | 60 | 70 | 80 | 85 | --- | --- | --- | --- | --- | --- |
| KCAS | 47 | 53 | 61 | 70 | 80 | 84 | --- | --- | --- | --- | --- | --- |

Figure 5-1. Airspeed Calibration (Sheet 1 of 2)

## STALL SPEEDS

DITIONS:
r Off

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

### MOST REARWARD CENTER OF GRAVITY

| EIGHT LBS | FLAP DEFLECTION | ANGLE OF BANK | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0° | | 30° | | 45° | | 60° | |
| | | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| 2400 | UP | 44 | 51 | 47 | 55 | 52 | 61 | 62 | 72 |
| | 10° | 35 | 48 | 38 | 52 | 42 | 57 | 49 | 68 |
| | 30° | 33 | 46 | 35 | 49 | 39 | 55 | 47 | 65 |

### MOST FORWARD CENTER OF GRAVITY

| NEIGHT LBS | FLAP DEFLECTION | ANGLE OF BANK | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0° | | 30° | | 45° | | 60° | |
| | | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS | KIAS | KCAS |
| 2400 | UP | 44 | 52 | 47 | 56 | 52 | 62 | 62 | 74 |
| | 10° | 37 | 49 | 40 | 53 | 44 | 58 | 52 | 69 |
| | 30° | 33 | 46 | 35 | 49 | 39 | 55 | 47 | 65 |

Figure 5-3. Stall Speeds





## WIND COMPONENTS

NOTE:
Maximum demonstrated crosswind velocity is 15 knots (not a limitation).

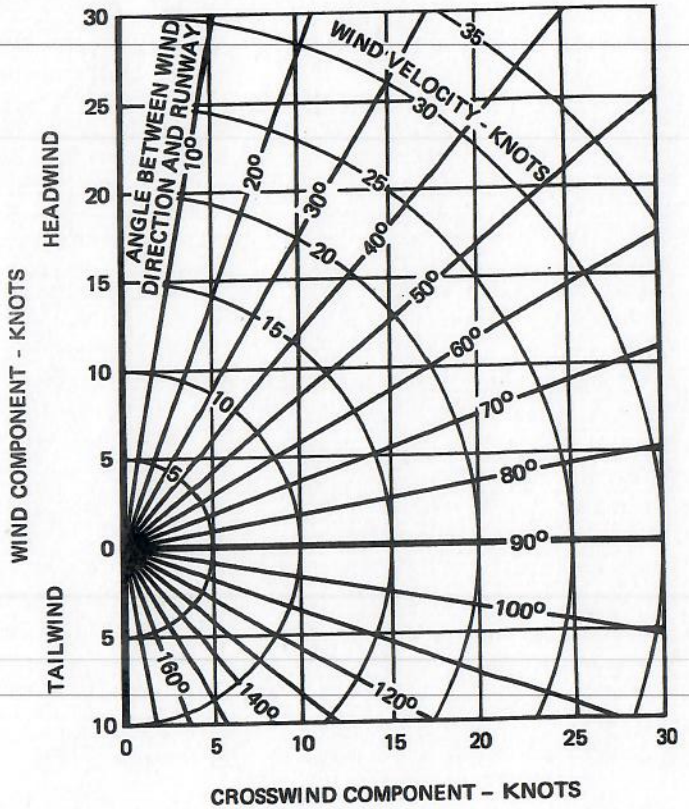



Figure 5-4. Wind Components

# TAKEOFF DISTANCE
## MAXIMUM WEIGHT 2400 LBS
## SHORT FIELD

CONDITIONS:
Flaps 10°
Full Throttle Prior to Brake Release
Paved, Level, Dry Runway
Zero Wind

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 tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
4. 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LIFT OFF | AT 50 FT | | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS |
| 2400 | 51 | 56 | S.L. | 795 | 1460 | 860 | 1570 | 925 | 1685 | 995 | 1810 | 1065 | 1945 |
| | | | 1000 | 875 | 1605 | 940 | 1725 | 1015 | 1860 | 1090 | 2000 | 1170 | 2155 |
| | | | 2000 | 960 | 1770 | 1035 | 1910 | 1115 | 2060 | 1200 | 2220 | 1290 | 2395 |
| | | | 3000 | 1055 | 1960 | 1140 | 2120 | 1230 | 2295 | 1325 | 2480 | 1425 | 2685 |
| | | | 4000 | 1165 | 2185 | 1260 | 2365 | 1355 | 2570 | 1465 | 2790 | 1575 | 3030 |
| | | | 5000 | 1285 | 2445 | 1390 | 2660 | 1500 | 2895 | 1620 | 3160 | 1745 | 3455 |
| | | | 6000 | 1425 | 2755 | 1540 | 3015 | 1665 | 3300 | 1800 | 3620 | 1940 | 3990 |
| | | | 7000 | 1580 | 3140 | 1710 | 3450 | 1850 | 3805 | 2000 | 4220 | - - - | - - - |
| | | | 8000 | 1755 | 3615 | 1905 | 4015 | 2060 | 4480 | - - - | - - - | - - - | - - - |

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



# TAKEOFF DISTANCE
## 2200 LBS AND 2000 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 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LIFT OFF | AT 50 FT | | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS |
| 2200 | 49 | 54 | S.L. | 650 | 1195 | 700 | 1280 | 750 | 1375 | 805 | 1470 | 865 | 1575 |
| | | | 1000 | 710 | 1310 | 765 | 1405 | 825 | 1510 | 885 | 1615 | 950 | 1735 |
| | | | 2000 | 780 | 1440 | 840 | 1545 | 905 | 1660 | 975 | 1785 | 1045 | 1915 |
| | | | 3000 | 855 | 1585 | 925 | 1705 | 995 | 1835 | 1070 | 1975 | 1150 | 2130 |
| | | | 4000 | 945 | 1750 | 1020 | 1890 | 1100 | 2040 | 1180 | 2200 | 1270 | 2375 |
| | | | 5000 | 1040 | 1945 | 1125 | 2105 | 1210 | 2275 | 1305 | 2465 | 1405 | 2665 |
| | | | 6000 | 1150 | 2170 | 1240 | 2355 | 1340 | 2555 | 1445 | 2775 | 1555 | 3020 |
| | | | 7000 | 1270 | 2440 | 1375 | 2655 | 1485 | 2890 | 1605 | 3155 | 1730 | 3450 |
| | | | 8000 | 1410 | 2760 | 1525 | 3015 | 1650 | 3305 | 1785 | 3630 | 1925 | 4005 |
| 2000 | 46 | 51 | S.L. | 525 | 970 | 565 | 1035 | 605 | 1110 | 650 | 1185 | 695 | 1265 |
| | | | 1000 | 570 | 1060 | 615 | 1135 | 665 | 1215 | 710 | 1295 | 765 | 1385 |
| | | | 2000 | 625 | 1160 | 675 | 1240 | 725 | 1330 | 780 | 1425 | 840 | 1525 |
| | | | 3000 | 690 | 1270 | 740 | 1365 | 800 | 1465 | 860 | 1570 | 920 | 1685 |
| | | | 4000 | 755 | 1400 | 815 | 1500 | 880 | 1615 | 945 | 1735 | 1015 | 1865 |
| | | | 5000 | 830 | 1545 | 900 | 1660 | 970 | 1790 | 1040 | 1925 | 1120 | 2070 |
| | | | 6000 | 920 | 1710 | 990 | 1845 | 1070 | 1990 | 1150 | 2145 | 1235 | 2315 |
| | | | 7000 | 1015 | 1900 | 1095 | 2055 | 1180 | 2225 | 1275 | 2405 | 1370 | 2605 |
| | | | 8000 | 1125 | 2125 | 1215 | 2305 | 1310 | 2500 | 1410 | 2715 | 1520 | 2950 |

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

# MAXIMUM RATE OF CLIMB

ONDITIONS:
laps Up
ull Throttle

OTE:
Mixture leaned above 3000 feet for maximum RPM.

| WEIGHT LBS | PRESS ALT FT | CLIMB SPEED KIAS | RATE OF CLIMB - FPM | | | |
|---|---|---|---|---|---|---|
| | | | -20°C | 0°C | 20°C | 40°C |
| 2400 | S.L. | 76 | 805 | 745 | 685 | 625 |
| | 2000 | 75 | 695 | 640 | 580 | 525 |
| | 4000 | 74 | 590 | 535 | 480 | 420 |
| | 6000 | 73 | 485 | 430 | 375 | 320 |
| | 8000 | 72 | 380 | 330 | 275 | 220 |
| | 10,000 | 71 | 275 | 225 | 175 | - - - |
| | 12,000 | 70 | 175 | 125 | - - - | - - - |

Figure 5-6. Maximum Rate of Climb





# TIME, FUEL, AND DISTANCE TO CLIMB

## MAXIMUM RATE OF CLIMB

CONDITIONS:
Flaps Up
Full Throttle
Standard Temperature

NOTES:
1. Add 1.1 gallons of fuel for engine start, taxi and takeoff allowance.
2. Mixture leaned above 3000 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.

| WEIGHT LBS | PRESSURE ALTITUDE FT | TEMP °C | CLIMB SPEED KIAS | RATE OF CLIMB FPM | FROM SEA LEVEL | | |
|---|---|---|---|---|---|---|---|
| | | | | | TIME MIN | FUEL USED GALLONS | DISTANCE NM |
| 2400 | S.L. | 15 | 76 | 700 | 0 | 0.0 | 0 |
| | 1000 | 13 | 76 | 655 | 1 | 0.3 | 2 |
| | 2000 | 11 | 75 | 610 | 3 | 0.6 | 4 |
| | 3000 | 9 | 75 | 560 | 5 | 1.0 | 6 |
| | 4000 | 7 | 74 | 515 | 7 | 1.4 | 9 |
| | 5000 | 5 | 74 | 470 | 9 | 1.7 | 11 |
| | 6000 | 3 | 73 | 425 | 11 | 2.2 | 14 |
| | 7000 | 1 | 72 | 375 | 14 | 2.6 | 18 |
| | 8000 | -1 | 72 | 330 | 17 | 3.1 | 22 |
| | 9000 | -3 | 71 | 285 | 20 | 3.6 | 26 |
| | 10,000 | -5 | 71 | 240 | 24 | 4.2 | 32 |
| | 11,000 | -7 | 70 | 190 | 29 | 4.9 | 38 |
| | 12,000 | -9 | 70 | 145 | 35 | 5.8 | 47 |

Figure 5-7. Time, Fuel, and Distance to Climb

# CRUISE PERFORMANCE

CONDITIONS:
2400 Pounds
Recommended Lean Mixture (See Section 4, Cruise)

| PRESSURE ALTITUDE FT | RPM | 20°C BELOW STANDARD TEMP | | | STANDARD TEMPERATURE | | | 20°C ABOVE STANDARD TEMP | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | % BHP | KTAS | GPH | % BHP | KTAS | GPH | % BHP | KTAS | GPH |
| 2000 | 2500 | - - - | - - - | - - - | 76 | 114 | 8.5 | 72 | 114 | 8.1 |
| | 2400 | 72 | 110 | 8.1 | 69 | 109 | 7.7 | 65 | 108 | 7.3 |
| | 2300 | 65 | 104 | 7.3 | 62 | 103 | 6.9 | 59 | 102 | 6.6 |
| | 2200 | 58 | 99 | 6.6 | 55 | 97 | 6.3 | 53 | 96 | 6.1 |
| | 2100 | 52 | 92 | 6.0 | 50 | 91 | 5.8 | 48 | 89 | 5.7 |
| 4000 | 2550 | - - - | - - - | - - - | 76 | 117 | 8.5 | 72 | 116 | 8.1 |
| | 2500 | 77 | 115 | 8.6 | 73 | 114 | 8.1 | 69 | 113 | 7.7 |
| | 2400 | 69 | 109 | 7.8 | 65 | 108 | 7.3 | 62 | 107 | 7.0 |
| | 2300 | 62 | 104 | 7.0 | 59 | 102 | 6.6 | 57 | 101 | 6.4 |
| | 2200 | 56 | 98 | 6.3 | 54 | 96 | 6.1 | 51 | 94 | 5.9 |
| | 2100 | 51 | 91 | 5.8 | 48 | 89 | 5.7 | 47 | 88 | 5.5 |
| 6000 | 2600 | - - - | - - - | - - - | 77 | 119 | 8.6 | 72 | 118 | 8.1 |
| | 2500 | 73 | 114 | 8.2 | 69 | 113 | 7.8 | 66 | 112 | 7.4 |
| | 2400 | 66 | 108 | 7.4 | 63 | 107 | 7.0 | 60 | 106 | 6.7 |
| | 2300 | 60 | 103 | 6.7 | 57 | 101 | 6.4 | 55 | 99 | 6.2 |
| | 2200 | 54 | 96 | 6.1 | 52 | 95 | 5.9 | 50 | 92 | 5.8 |
| | 2100 | 49 | 90 | 5.7 | 47 | 88 | 5.5 | 46 | 86 | 5.5 |
| 8000 | 2650 | - - - | - - - | - - - | 77 | 121 | 8.6 | 73 | 120 | 8.1 |
| | 2600 | 77 | 119 | 8.7 | 73 | 118 | 8.2 | 69 | 117 | 7.8 |
| | 2500 | 70 | 113 | 7.8 | 66 | 112 | 7.4 | 63 | 111 | 7.1 |
| | 2400 | 63 | 108 | 7.1 | 60 | 106 | 6.7 | 58 | 104 | 6.5 |
| | 2300 | 57 | 101 | 6.4 | 55 | 100 | 6.2 | 53 | 97 | 6.0 |
| | 2200 | 52 | 95 | 6.0 | 50 | 93 | 5.8 | 49 | 91 | 5.7 |
| 10,000 | 2600 | 74 | 118 | 8.3 | 70 | 117 | 7.8 | 66 | 115 | 7.4 |
| | 2500 | 67 | 112 | 7.5 | 64 | 111 | 7.1 | 61 | 109 | 6.8 |
| | 2400 | 61 | 106 | 6.8 | 58 | 105 | 6.5 | 56 | 102 | 6.3 |
| | 2300 | 55 | 100 | 6.3 | 53 | 98 | 6.0 | 51 | 96 | 5.9 |
| | 2200 | 50 | 93 | 5.8 | 49 | 91 | 5.7 | 47 | 89 | 5.6 |
| 12,000 | 2550 | 67 | 114 | 7.5 | 64 | 112 | 7.1 | 61 | 111 | 6.9 |
| | 2500 | 64 | 111 | 7.2 | 61 | 109 | 6.8 | 59 | 107 | 6.6 |
| | 2400 | 59 | 105 | 6.6 | 56 | 103 | 6.3 | 54 | 100 | 6.1 |
| | 2300 | 53 | 98 | 6.1 | 51 | 96 | 5.9 | 50 | 94 | 5.8 |

Figure 5-8. Cruise Performance





# RANGE PROFILE
## 45 MINUTES RESERVE
## 40 GALLONS USABLE FUEL

CONDITIONS:
2400 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

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

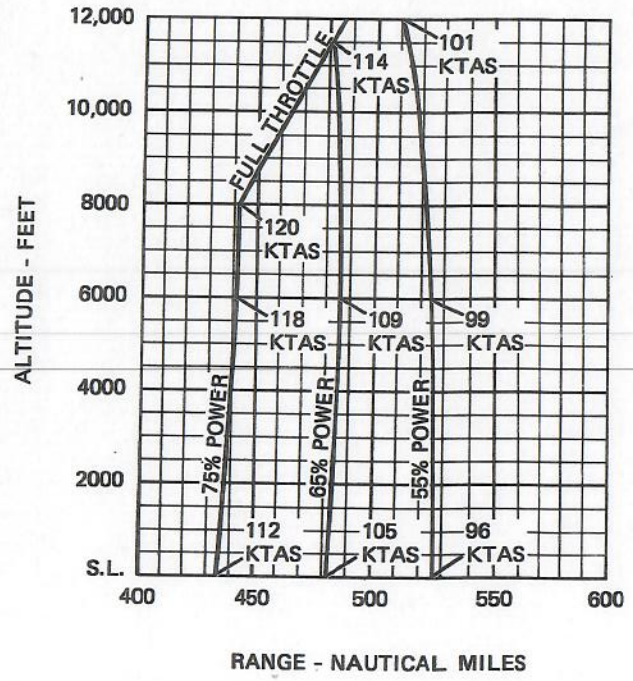



Figure 5-9. Range Profile (Sheet 1 of 3)

## ENDURANCE PROFILE
### 45 MINUTES RESERVE
### 62 GALLONS USABLE FUEL

IDITIONS:
) Pounds
ommended Lean Mixture for Cruise
dard Temperature

TE:
chart allows for the fuel used for engine start, taxi, takeoff and climb, and the
during climb.

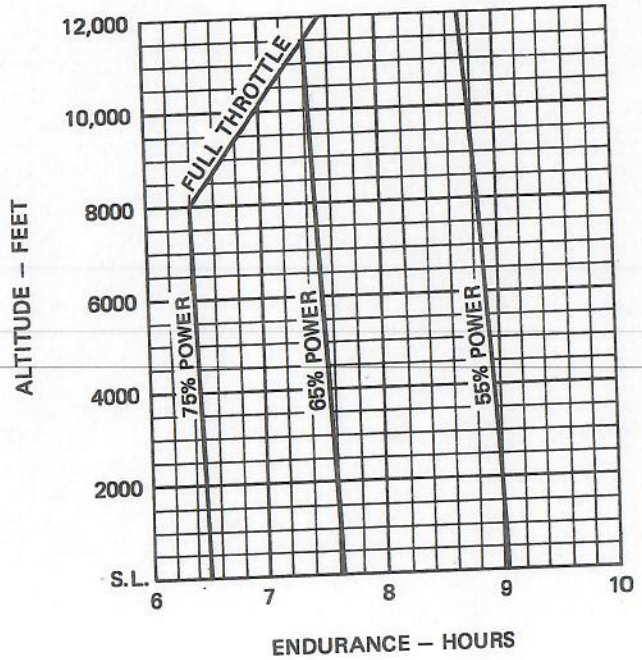



Figure 5-10. Endurance Profile (Sheet 3 of 3)





## LANDING DISTANCE

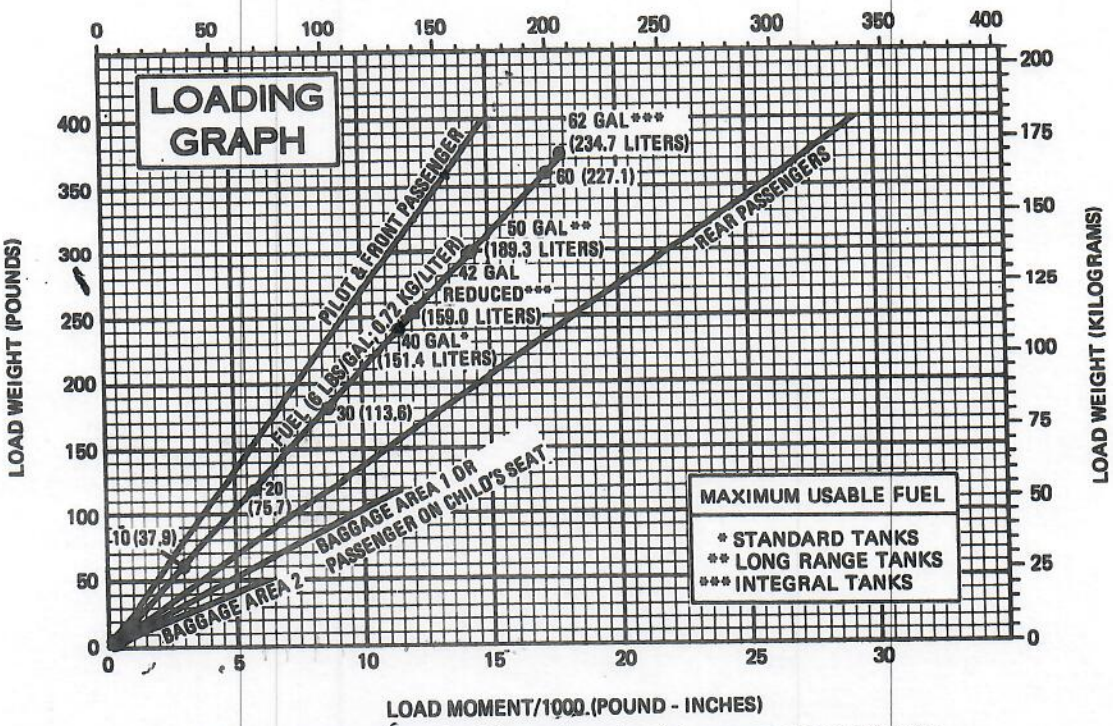
SHORT FIELD

CONDITIONS:
Flaps 30°
Power Off
Maximum Braking
Paved, Level, Dry Runway
Zero Wind

| WEIGHT LBS | SPEED AT 50 FT KIAS | PRESS ALT FT | 0°C | | 10°C | | 20°C | | 30°C | | 40°C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS | GRND ROLL | TOTAL TO CLEAR 50 FT OBS |
| 2400 | 61 | S.L. | 510 | 1235 | 530 | 1265 | 550 | 1295 | 570 | 1325 | 585 | 1350 |
| | | 1000 | 530 | 1265 | 550 | 1295 | 570 | 1325 | 590 | 1360 | 610 | 1390 |
| | | 2000 | 550 | 1295 | 570 | 1330 | 590 | 1360 | 610 | 1390 | 630 | 1425 |
| | | 3000 | 570 | 1330 | 590 | 1360 | 615 | 1395 | 635 | 1430 | 655 | 1460 |
| | | 4000 | 595 | 1365 | 615 | 1400 | 635 | 1430 | 660 | 1470 | 680 | 1500 |
| | | 5000 | 615 | 1400 | 640 | 1435 | 660 | 1470 | 685 | 1510 | 705 | 1540 |
| | | 6000 | 640 | 1435 | 660 | 1470 | 685 | 1510 | 710 | 1550 | 730 | 1580 |
| | | 7000 | 665 | 1475 | 690 | 1515 | 710 | 1550 | 735 | 1590 | 760 | 1630 |
| | | 8000 | 690 | 1515 | 715 | 1555 | 740 | 1595 | 765 | 1635 | 790 | 1675 |

NOTES:
1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on a dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If a landing with flaps up is necessary, increase the approach speed by 7 KIAS and allow for 35% longer distances.

Figure 5-11. Landing Distance




NOTE: Line representing adjustable seats shows the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant C.G. range.

Figure 6-6. Loading Graph





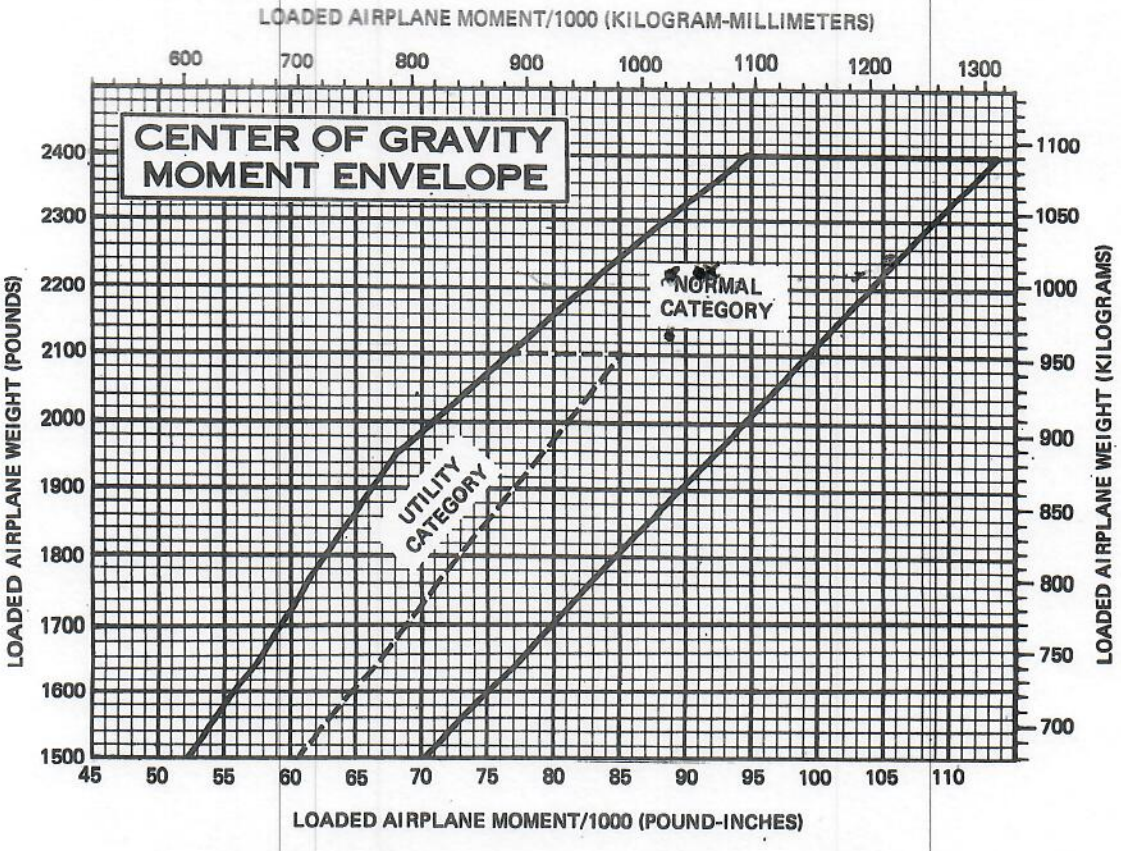



Figure 6-7. Center of Gravity Moment Envelope

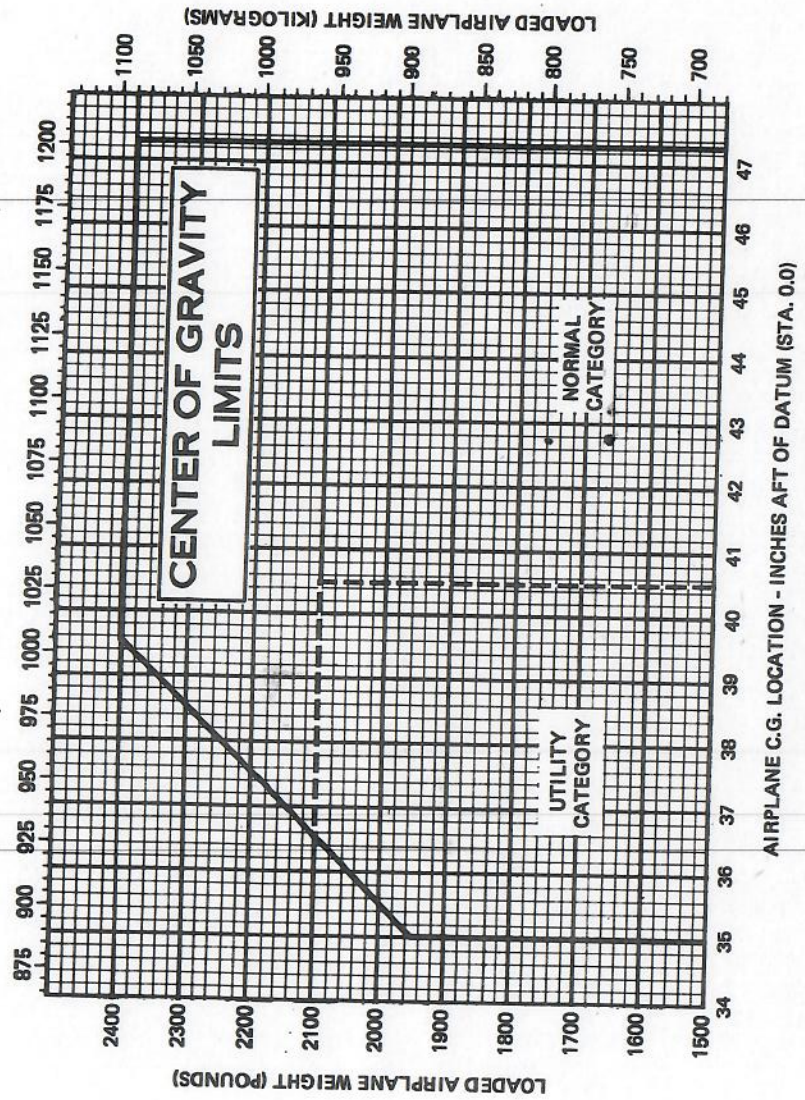



Figure 6-8. Center of Gravity Limits





# EQUIPMENT LIST

The following equipment list is a comprehensive list of all Cessna equipment available for this airplane. A separate equipment list of items installed in your specific airplane is provided in your aircraft file. The following list and the specific list for your airplane have a similar order of listing.

This equipment list provides the following information:

An **item number** gives the identification number for the item. Each number is prefixed with a letter which identifies the **descriptive** grouping (example: A. Powerplant & Accessories) under which it is listed. Suffix letters identify the equipment as a required item, a standard item or an optional item. Suffix letters are as follows:

-R = required items of equipment for FAA certification
-S = standard equipment items
-O = optional equipment items replacing required or standard items
-A = optional equipment items which are in addition to required or standard items

A **reference drawing** column provides the drawing number for the item.

NOTE

If additional equipment is to be installed, it must be done in accordance with the reference drawing, accessory kit instructions, or a separate FAA approval.

Columns showing **weight (in pounds)** and **arm (in inches)** provide the weight and center of gravity location for the equipment.

NOTE

Unless otherwise indicated, true values (not net change values) for the weight and arm are shown. Positive arms are distances aft of the airplane datum; negative arms are distances forward of the datum.

NOTE

Asterisks (*) after the item weight and arm indicate complete assembly installations. Some major components of the assembly are listed on the lines immediately following. The summation of these major components does not necessarily equal the complete assembly installation.