

N739KS – Cessna 172



Aircraft 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 shown on the operational limitations placard.

	SPEED	KCAS	KIAS	REMARKS
VNE	Never Exceed Speed	158	160	Do not exceed this speed in any operation.
VNO	Maximum Structural Cruising Speed	126	128	Do not exceed this speed except in smooth air, and then only with caution.
VA	Maneuvering Speed: 2300 Pounds 1950 Pounds 1600 Pounds	96 88 80	97 89 80	Do not make full or abrupt control movements above this speed.
VFE	Maximum Flap Extended Speed	86	85	Do not exceed this speed with flaps down.
	Maximum Window Open Speed	158	160	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	41 - 85	Full Flap Operating Range. Lower limit is maximum weight V_{SO} in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Arc	47 - 128	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	128 - 160	Operations must be conducted with caution and only in smooth air.
Red Line	160	Maximum speed for all operations.

Figure 2-2. Airspeed Indicator Markings

POWER PLANT LIMITATIONS

Engine Manufacturer: Avco Lycoming.

Engine Model Number: O-320-H2AD.

Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Power: 160 BHP.

Maximum Engine Speed: 2700 RPM.

NOTE

The static RPM range at full throttle (carburetor heat off and full rich mixture) is 2280 to 2400 RPM.

Maximum Oil Temperature: 118°C (245°F).

Oil Pressure, Minimum: 25 psi.

Maximum: 100 psi.

Propeller Manufacturer: McCauley Accessory Division.

Propeller Model Number: 1C160/DTM7557.

Propeller Diameter, Maximum: 75 inches.

Minimum: 74 inches.

POWER PLANT INSTRUMENT MARKINGS

Power plant instrument markings and their color code significance are shown in figure 2-3.

INSTRUMENT	RED LINE	GREEN ARC	YELLOW ARC	RED LINE
	MINIMUM LIMIT	NORMAL OPERATING	CAUTION RANGE	MAXIMUM LIMIT
Tachometer	---	2200 - 2700 RPM	---	2700 RPM
Oil Temperature	---	100°-245°F	---	245°F
Oil Pressure	25 psi	60-90 psi	---	100 psi
Carburetor Air Temperature	---	---	-15° to 5°C	---

Figure 2-3. Power Plant Instrument Markings

WEIGHT LIMITS

NORMAL CATEGORY

Maximum Takeoff Weight: 2300 lbs.

Maximum Landing Weight: 2300 lbs.

Maximum Weight in Baggage Compartment:

Baggage Area 1 (or passenger on child's seat) - Station 82 to 108: 120 lbs. See note below.

Baggage Area 2 - Station 108 to 142: 50 lbs. See note below.

NOTE

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

INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. Enroute weather emergencies can be minimized or eliminated by careful flight planning and good judgment when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. Emergency procedures associated with ELT and other optional systems can be found in Section 9.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:	
Wing Flaps Up	65 KIAS
Wing Flaps Down	60 KIAS
Maneuvering Speed:	
2300 Lbs	97 KIAS
1950 Lbs	89 KIAS
1600 Lbs	80 KIAS
Maximum Glide:	
2300 Lbs	65 KIAS
Precautionary Landing With Engine Power	60 KIAS
Landing Without Engine Power:	
Wing Flaps Up	65 KIAS
Wing Flaps Down	60 KIAS

OPERATIONAL CHECKLISTS

ENGINE FAILURES

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle -- IDLE.
2. Brakes -- APPLY.
3. Wing Flaps -- RETRACT.
4. Mixture -- IDLE CUT-OFF.
5. Ignition Switch -- OFF.
6. Master Switch -- OFF.

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Airspeed -- 65 KIAS (flaps UP).
60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED.
6. Master Switch -- OFF.

ENGINE FAILURE DURING FLIGHT

1. Airspeed -- 65 KIAS.
2. Carburetor Heat -- ON.
3. Fuel Selector Valve -- BOTH.
4. Mixture -- RICH.
5. Ignition Switch -- BOTH (or START if propeller is stopped).
6. Primer -- IN and LOCKED.

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Airspeed -- 65 KIAS (flaps UP).
60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (40° recommended).
6. Master Switch -- OFF.
7. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
8. Touchdown -- SLIGHTLY TAIL LOW.
9. Brakes -- APPLY HEAVILY.

PRECAUTIONARY LANDING WITH ENGINE POWER

1. Wing Flaps -- 20°.
2. Airspeed -- 60 KIAS.
3. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
4. Avionics Power Switch and Electrical Switches -- OFF.
5. Wing Flaps -- 40° (on final approach).
6. Airspeed -- 60 KIAS.
7. Master Switch -- OFF.
8. Doors -- UNLATCH PRIOR TO TOUCHDOWN.

9. Touchdown -- SLIGHTLY TAIL, LOW.
10. Ignition Switch -- OFF.
11. Brakes -- APPLY HEAVILY.

DITCHING

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions.
2. Heavy Objects (in baggage area) -- SECURE OR JETTISON.
3. Approach -- High Winds, Heavy Seas -- INTO THE WIND.
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
4. Wing Flaps -- 20° - 40°.
5. Power -- ESTABLISH 300 FT/MIN DESCENT AT 55 KIAS.

NOTE

If no power is available, approach at 65 KIAS with flaps up or at 60 KIAS with 10° flaps.

6. Cabin Doors -- UNLATCH.

Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT.

8. Face -- CUSHION at touchdown with folded coat.
9. Airplane -- EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so doors can be opened.
10. Life Vests and Raft -- INFLATE.

FIRES

DURING START ON GROUND

1. Cranking -- CONTINUE, to get a start which would suck the flames and accumulated fuel through the carburetor and into the engine.

If engine starts:

2. Power -- 1700 RPM for a few minutes.
3. Engine -- SHUT DOWN and inspect for damage.
If engine fails to start:
4. Throttle -- FULL OPEN.
5. Mixture -- IDLE CUT-OFF.

6. Cranking -- CONTINUE.
7. Fire Extinguisher -- OBTAIN (have ground attendants obtain if installed).
8. Engine -- SECURE.
 - a. Master Switch -- OFF.
 - b. Ignition Switch -- OFF.
 - c. Fuel Selector Valve -- OFF.
9. Fire -- EXTINGUISH using fire extinguisher, wool blanket, or dirt.
10. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

ENGINE FIRE IN FLIGHT

1. Mixture -- IDLE CUT-OFF.
2. Fuel Selector Valve -- OFF.
3. Master Switch -- OFF.
4. Cabin Heat and Air -- OFF (except overhead vents).
5. Airspeed -- 100 KIAS (If fire is not extinguished, increase glide mixture) to find an airspeed which will provide an incombustible mixture).
6. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

1. Master Switch -- OFF.
2. Avionics Power Switch -- OFF.
3. All Other Switches (except ignition switch) -- OFF.
4. Vents/Cabin Air/Heat -- CLOSED.
5. Fire Extinguisher -- ACTIVATE (if available).

WARNING

After discharging an extinguisher within a closed cabin, ventilate the cabin.

If fire appears out and electrical power is necessary for continuance of flight:

6. Master Switch -- ON.
7. Circuit Breakers -- CHECK for faulty circuit, do not reset.
8. Radio Switches -- OFF.
9. Avionics Power Switch -- ON.
10. Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localized.

11. Vents/Cabin Air/Heat -- OPEN when it is ascertained that fire is completely extinguished.

CABIN FIRE

1. Master Switch -- OFF.
2. Vents/Cabin Air/Heat -- CLOSED (to avoid drafts).
3. Fire Extinguisher -- ACTIVATE (if available).

WARNING

After discharging an extinguisher within a closed cabin, ventilate the cabin.

4. Land the airplane as soon as possible to inspect for damage.

WING FIRE

1. Navigation Light Switch -- OFF.
2. Pitot Heat Switch (if installed) -- OFF.
3. Strobe Light Switch (if installed) -- OFF.

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin, and land as soon as possible using flaps only as required for final approach and touchdown.

ICING

INADVERTENT ICING ENCOUNTER

1. Turn pitot heat switch ON (if installed).
2. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
3. Pull cabin heat control full out and open defroster outlet to obtain maximum windshield defroster airflow. Adjust cabin air control to get maximum defroster heat and airflow.
4. Open the throttle to increase engine speed and minimize ice build-up on propeller blades.
5. Watch for signs of carburetor air filter ice and apply carburetor

heat as required. An unexplained loss in engine speed could be caused by carburetor ice or air intake filter ice. Lean the mixture for maximum RPM, if carburetor heat is used continuously.

6. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable "off airport" landing site.
7. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for significantly higher stall speed.
8. Leave wing flaps retracted. With a severe ice build-up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
9. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
10. Perform a landing approach using a forward slip, if necessary, for improved visibility.
11. Approach at 65 to 75 KIAS depending upon the amount of the accumulation.
12. Perform a landing in level attitude.

STATIC SOURCE BLOCKAGE (Erroneous Instrument Reading Suspected)

1. Alternate Static Source Valve -- PULL ON.
2. Airspeed -- Consult appropriate calibration tables in Section 5.

LANDING WITH A FLAT MAIN TIRE

1. Approach -- NORMAL.
2. Touchdown -- GOOD TIRE FIRST, hold airplane off flat tire as long as possible.

ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS

OVER VOLTAGE LIGHT ILLUMINATES

1. Avionics Power Switch -- OFF.
2. Master Switch -- OFF (both sides).
3. Master Switch -- ON.
4. Over Voltage Light -- OFF.
5. Avionics Power Switch -- ON.

If over-voltage light illuminates again:

6. Flight -- TERMINATE as soon as possible.

AMMETER SHOWS DISCHARGE

1. Alternator -- OFF.
2. Nonessential Radio/Electrical Equipment -- OFF.
3. Flight -- TERMINATE as soon as practical.

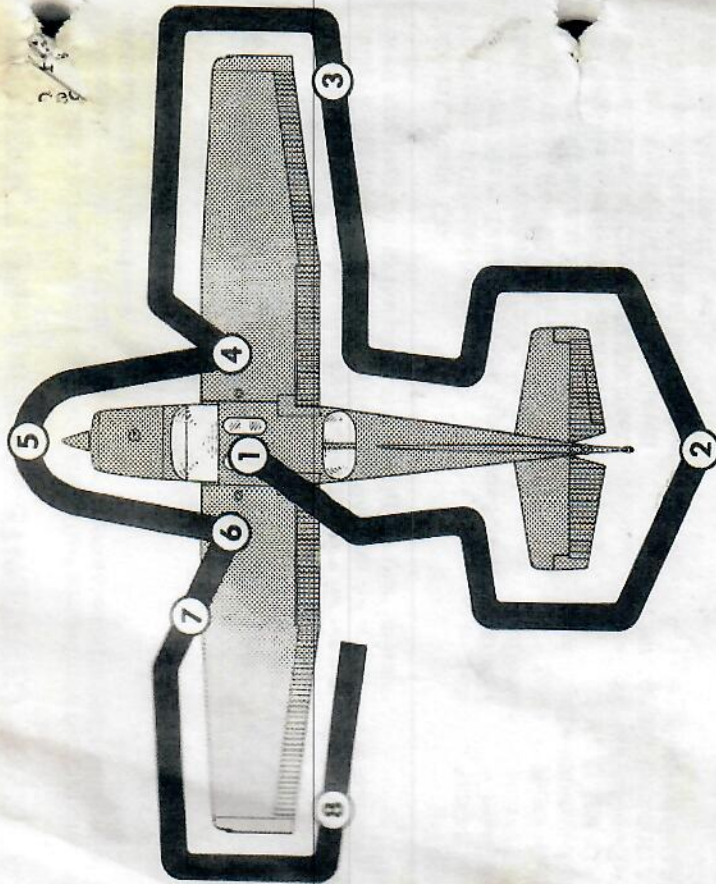
INTRODUCTION

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 2300 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, Flaps Up:	
Normal Climb Out	70-80 KIAS
Short Field Takeoff, Flaps Up, Speed at 50 Feet	59 KIAS
Enroute Climb, Flaps Up:	
Normal, Sea Level	75-85 KIAS
Normal, 10,000 Feet	70-80 KIAS
Best Rate of Climb, Sea Level	73 KIAS
Best Rate of Climb, 10,000 Feet	68 KIAS
Best Angle of Climb, Sea Level	59 KIAS
Best Angle of Climb, 10,000 Feet	61 KIAS
Landing Approach:	
Normal Approach, Flaps Up	60-70 KIAS
Normal Approach, Flaps 40°	55-65 KIAS
Short Field Approach, Flaps 40°	60 KIAS
Balked Landing:	
Maximum Power, Flaps 20°	55 KIAS
Maximum Recommended Turbulent Air Penetration Speed:	
2300 Lbs	97 KIAS
1950 Lbs	89 KIAS
1600 Lbs	80 KIAS
Maximum Demonstrated Crosswind Velocity:	
Takeoff or Landing	15 KNOTS



NOTE

Visually check airplane for general condition during walk-around inspection. 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. Control Wheel Lock -- REMOVE.
2. Ignition Switch -- OFF.
3. Avionics Power Switch -- OFF.
4. Master Switch -- ON.
5. Fuel Quantity Indicators -- CHECK QUANTITY.
6. Master Switch -- OFF.
7. 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. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment, and proper fuel grade.
4. Fuel Quantity -- CHECK VISUALLY for desired level.
5. Fuel Filler Cap -- SECURE.

⑤ NOSE

1. Engine Oil Level -- CHECK, do not operate with less than four quarts. Fill to six quarts for extended flight.
2. Before first flight of the day and after each refueling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. 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 valve drain plug will be necessary.

3. Propeller and Spinner -- CHECK for nicks and security.
4. Landing Light(s) -- CHECK for condition and cleanliness.
5. Carburetor Air Filter -- CHECK for restrictions by dust or other foreign matter.
6. Nose Wheel Strut and Tire -- CHECK for proper inflation.
7. Nose Tie-Down -- DISCONNECT.
8. Static Source Opening (left side of fuselage) -- CHECK for stoppage.

⑥ LEFT WING

1. Main Wheel Tire -- CHECK for proper inflation.
2. Before first flight of the day and after each refueling, use sampler cup and drain small quantity of fuel from fuel tank sump quick-drain valve to check for water, sediment and proper fuel grade.
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.

⑧ LEFT WING Trailing Edge

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

BEFORE STARTING ENGINE

1. Preflight Inspection -- COMPLETE.
2. Seats, Belts, Shoulder Harnesses -- ADJUST and LOCK.
3. Fuel Selector Valve -- BOTH.
4. Avionics Power Switch, Autopilot (if installed), Electrical Equipment -- OFF.

CAUTION

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

5. Brakes -- TEST and SET.
6. Circuit Breakers -- CHECK IN.

STARTING ENGINE

1. Mixture -- RICH.
2. Carburetor Heat -- COLD.
3. Master Switch -- ON.
4. Prime -- AS REQUIRED (2 to 6 strokes; none if engine is warm).
5. Throttle -- OPEN 1/8 INCH.
6. Propeller Area -- CLEAR.
7. Ignition Switch -- START (release when engine starts).
8. Oil Pressure -- CHECK.

BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Cabin Doors and Window(s) -- CLOSED and LOCKED.
3. Flight Controls -- FREE and CORRECT.
4. Flight Instruments -- SET.
5. Fuel Selector Valve -- BOTH.
6. Mixture -- RICH (below 3000 feet).
7. Elevator Trim and Rudder Trim (if installed) -- TAKEOFF.
8. 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. Engine Instruments and Ammeter -- CHECK.
 - d. Suction Gage -- CHECK.
9. Avionics Power Switch -- ON.
10. Radios -- SET.
11. Autopilot (if installed) -- OFF.
12. Air Conditioner (if installed) -- OFF.
13. Flashing Beacon, Navigation Lights and/or Strobe Lights -- ON as required.
14. Throttle Friction Lock -- ADJUST.
15. Brakes -- RELEASE.

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps -- UP.
2. Carburetor Heat -- COLD.
3. Throttle -- FULL OPEN.
4. Elevator Control -- LIFT NOSE WHEEL (at 55 KIAS).
5. Climb Speed -- 70-80 KIAS.

SHORT FIELD TAKEOFF

1. Wing Flaps -- UP.
2. Carburetor Heat -- COLD.
3. Brakes -- APPLY.
4. Throttle -- FULL OPEN.
5. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
6. Brakes -- RELEASE.
7. Elevator Control -- SLIGHTLY TAIL LOW.
8. Climb Speed -- 59 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 -- 2200-2700 RPM (no more than 75% is recommended).
2. Elevator and Rudder Trim (if installed) -- ADJUST.
3. Mixture -- LEAN.

DESCENT

1. Mixture -- ADJUST for smooth operation (full rich for idle power).
2. Power -- AS DESIRED.
3. Carburetor Heat -- AS REQUIRED (to prevent carburetor icing).

BEFORE LANDING

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

LANDING

NORMAL LANDING

1. Airspeed -- 60-70 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (below 85 KIAS).
3. Airspeed -- 55-65 KIAS (flaps DOWN).
4. Touchdown -- MAIN WHEELS FIRST.
5. Landing Roll -- LOWER NOSE WHEEL GENTLY.
6. Braking -- MINIMUM REQUIRED.

SHORT FIELD LANDING

1. Airspeed -- 60-70 KIAS (flaps UP).
2. Wing Flaps -- FULL DOWN (40°).
3. Airspeed -- 60 KIAS (until flare).
4. Power -- REDUCE to idle after clearing obstacle.
5. Touchdown -- MAIN WHEELS FIRST.
6. Brakes -- APPLY HEAVILY.
7. Wing Flaps -- RETRACT.

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

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

FLAPS UP		40	50	60	70	80	90	100	110	120	130	140
KIAS		49	55	62	70	80	89	99	108	118	128	138
KCAS												
FLAPS 10°		40	50	60	70	80	85	---	---	---	---	---
KIAS		49	55	62	71	80	85	---	---	---	---	---
KCAS												
FLAPS 40°		40	50	60	70	80	85	---	---	---	---	---
KIAS		47	54	62	71	81	86	---	---	---	---	---
KCAS												

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

AIRSPEED CALIBRATION
ALTERNATE STATIC SOURCE

HEATER/VENTS AND WINDOWS CLOSED

FLAPS UP		40	50	60	70	80	90	100	110	120	130	140
NORMAL KIAS		39	51	61	71	82	91	101	111	121	131	141
ALTERNATE KIAS												
FLAPS 10°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		40	51	61	71	81	85	---	---	---	---	---
FLAPS 40°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		38	50	60	70	79	83	---	---	---	---	---

HEATER/VENTS OPEN AND WINDOWS CLOSED

FLAPS UP		40	50	60	70	80	90	100	110	120	130	140
NORMAL KIAS		36	48	59	70	80	89	99	108	118	128	139
ALTERNATE KIAS												
FLAPS 10°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		38	49	59	69	79	84	---	---	---	---	---
FLAPS 40°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		34	47	57	67	77	81	---	---	---	---	---

WINDOWS OPEN

FLAPS UP		40	50	60	70	80	90	100	110	120	130	140
NORMAL KIAS		26	43	57	70	82	93	103	113	123	133	143
ALTERNATE KIAS												
FLAPS 10°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		25	43	57	69	80	85	---	---	---	---	---
FLAPS 40°		40	50	60	70	80	85	---	---	---	---	---
NORMAL KIAS		40	50	60	70	80	85	---	---	---	---	---
ALTERNATE KIAS		25	41	54	67	78	84	---	---	---	---	---

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

STALL SPEEDS

CONDITIONS:
Power Off

NOTES:

1. Maximum altitude loss during a stall recovery may be as much as 180 feet.
2. KIAS values are approximate.

MOST REARWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2300	UP	42	50	45	54	50	59	59	71
	10°	38	47	40	51	45	56	54	66
	40°	36	44	38	47	43	52	51	62

MOST FORWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2300	UP	47	53	51	57	56	63	66	75
	10°	44	51	47	55	52	61	62	72
	40°	41	47	44	51	49	56	58	66

Figure 5-3. Stall Speeds

TAKEOFF DISTANCE MAXIMUM WEIGHT 2300 LBS

SHORT FIELD

CONDITIONS:
 Flaps Up
 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
2300	52	59	S.L.	720	1300	775	1390	835	1490	895	1590	960	1700
			1000	790	1420	850	1525	915	1630	980	1745	1050	1865
			2000	865	1555	930	1670	1000	1790	1075	1915	1155	2055
			3000	950	1710	1025	1835	1100	1970	1185	2115	1270	2265
			4000	1045	1880	1125	2025	1210	2175	1300	2335	1400	2510
			5000	1150	2075	1240	2240	1335	2410	1435	2595	1540	2795
			6000	1265	2305	1365	2485	1475	2680	1585	2895	1705	3125
			7000	1400	2565	1510	2770	1630	3000	1755	3245	1890	3515
			8000	1550	2870	1675	3110	1805	3375	1945	3670	2095	3990

Figure 5-4. Takeoff Distance (Sheet 1 of 2)

TAKEOFF DISTANCE 2100 LBS AND 1900 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
2100	50	56	S.L.	585	1070	630	1140	680	1220	725	1300	780	1390
			1000	640	1165	690	1245	740	1330	795	1420	850	1520
			2000	700	1270	755	1360	810	1455	870	1555	935	1665
			3000	770	1390	830	1490	890	1595	955	1710	1025	1830
			4000	845	1525	910	1640	980	1755	1050	1880	1130	2015
			5000	930	1680	1000	1805	1075	1935	1155	2075	1240	2230
			6000	1025	1850	1100	1990	1185	2140	1275	2300	1370	2475
			7000	1130	2050	1215	2210	1310	2380	1410	2560	1515	2755
			8000	1245	2275	1345	2460	1450	2655	1560	2865	1680	3090
1900	47	54	S.L.	470	865	505	920	540	985	580	1045	620	1115
			1000	515	940	550	1005	590	1070	635	1140	680	1215
			2000	560	1025	605	1095	645	1170	695	1245	745	1330
			3000	615	1115	660	1195	710	1275	760	1365	815	1455
			4000	670	1220	725	1305	780	1400	835	1495	895	1595
			5000	740	1340	795	1435	855	1535	920	1640	985	1755
			6000	810	1470	875	1575	940	1690	1010	1810	1085	1940
			7000	895	1620	965	1740	1035	1865	1115	2000	1195	2145
			8000	985	1790	1065	1925	1145	2065	1230	2220	1320	2385

Figure 5-4. Takeoff Distance (Sheet 2 of 2)

RATE OF CLIMB

MAXIMUM

CONDITIONS:
Flaps Up
Full Throttle
Standard Temperature

NOTE:

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
2300	S.L.	73	875	815	755	695
	2000	72	765	705	650	590
	4000	71	655	600	545	485
	6000	70	545	495	440	385
	8000	69	440	390	335	280
	10,000 12,000	68 67	335 230	285 180	230 ---	---

Figure 5-5. 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
300	S.L.	15	73	770	0	0.0	0
	1000	13	73	725	1	0.3	2
	2000	11	72	675	3	0.6	3
	3000	9	72	630	4	0.9	5
	4000	7	71	580	6	1.2	8
	5000	5	71	535	8	1.6	10
	6000	3	70	485	10	1.9	12
	7000	1	69	440	12	2.3	15
	8000	-1	69	390	15	2.7	19
	9000	-3	68	345	17	3.2	22
	10,000	-5	68	295	21	3.7	27
	11,000 12,000	-7 -9	67 67	250 200	24 29	4.2 4.9	32 38

Figure 5-6. Time, Fuel, and Distance to Climb

CRUISE PERFORMANCE

CONDITIONS:
2300 Pounds
Recommended Lean Mixture

PRESSURE ALTITUDE FT	RPM	20°C BELOW STANDARD TEMP		STANDARD TEMPERATURE		20°C ABOVE STANDARD TEMP			
		% BHP	GPH	% BHP	GPH	% BHP	GPH		
2000	2500	---	---	75	116	71	8.4	115	7.9
	2400	72	8.0	67	111	63	7.5	110	7.1
	2300	64	7.1	60	105	56	6.3	105	6.3
	2200	56	6.3	53	100	50	5.8	99	5.8
4000	2100	50	5.8	47	94	45	5.6	93	5.4
	---	---	---	---	---	---	---	---	---
	2550	---	---	75	118	71	8.4	118	7.9
	2500	76	8.5	71	115	67	8.0	115	7.5
6000	2400	68	7.6	64	110	60	7.1	109	6.7
	2300	60	6.8	57	105	54	6.4	104	6.1
	2200	54	6.1	51	99	48	5.9	98	5.7
	2100	48	5.6	46	93	44	5.5	92	5.3
8000	---	---	---	---	---	---	---	---	---
	2600	---	---	75	120	71	8.4	120	7.5
	2500	72	8.1	67	115	64	7.6	114	7.1
	2400	64	7.2	60	109	57	6.8	109	6.4
10,000	2300	57	6.5	54	104	52	6.2	103	5.9
	2200	51	5.9	49	98	47	5.7	97	5.5
	2100	46	5.5	44	92	42	5.4	91	5.2
	---	---	---	---	---	---	---	---	---
12,000	2650	---	---	75	122	71	8.4	122	7.9
	2600	76	8.6	71	120	67	8.0	119	7.5
	2500	68	7.7	64	114	60	7.2	113	6.8
	2400	61	6.9	58	109	55	6.5	108	6.2
14,000	2300	55	6.2	52	103	50	6.0	102	5.8
	2200	49	5.7	47	97	45	5.5	96	5.4
	---	---	---	---	---	---	---	---	---
	2650	76	8.5	71	122	67	8.0	121	7.5
16,000	2600	72	8.1	68	119	64	7.6	118	7.1
	2500	65	7.3	61	114	58	6.8	112	6.5
	2400	58	6.5	55	108	52	6.2	107	6.0
	2300	52	6.0	50	102	48	5.6	101	5.6
18,000	2200	47	5.6	45	96	44	5.4	95	5.3
	---	---	---	---	---	---	---	---	---
	2600	68	7.7	64	118	61	7.2	117	6.8
	2500	62	6.9	58	113	55	6.5	111	6.2
20,000	2400	56	6.3	53	107	51	6.0	106	5.8
	2300	50	5.8	48	101	46	5.6	100	5.5
	2200	46	5.5	44	95	43	5.4	94	5.3
	---	---	---	---	---	---	---	---	---

Figure 5-7. Cruise Performance

RANGE PROFILE 45 MINUTES RESERVE 40 GALLONS USABLE FUEL

CONDITIONS:
2300 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

NOTES:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45% BHP and is 4.1 gallons.

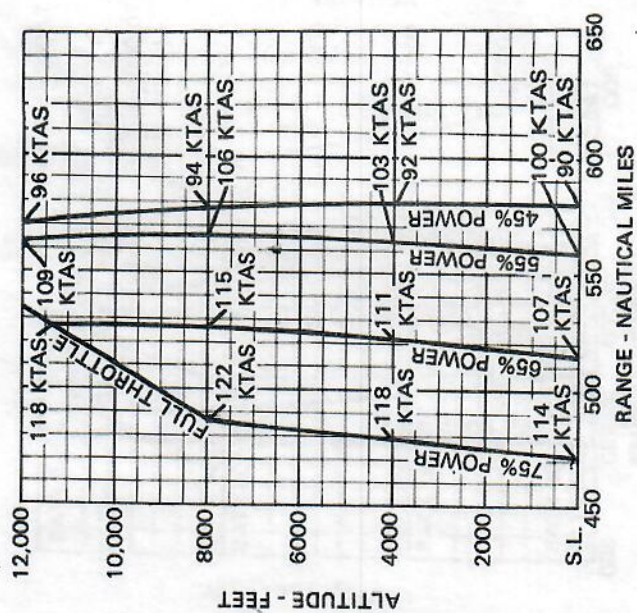


Figure 5-8. Range Profile (Sheet 1 of 2)

ENDURANCE PROFILE
45 MINUTES RESERVE
40 GALLONS USABLE FUEL

CONDITIONS:
2300 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

- NOTES:**
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb as shown in figure 5-6.
 2. Reserve fuel is based on 45 minutes at 45% BHP and is 4.1 gallons.

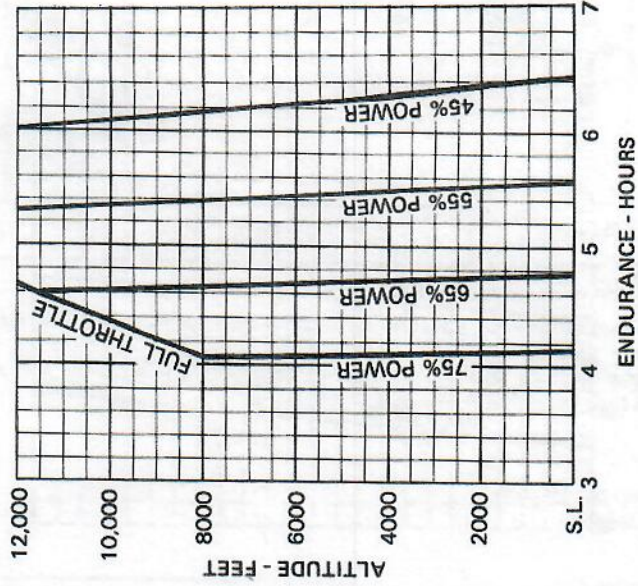


Figure 5-9. Endurance Profile (Sheet 1 of 2)

RANGE PROFILE
45 MINUTES RESERVE
50 GALLONS USABLE FUEL

CONDITIONS:
2300 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

- NOTES:**
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb as shown in figure 5-6.
 2. Reserve fuel is based on 45 minutes at 45% BHP and is 4.1 gallons.

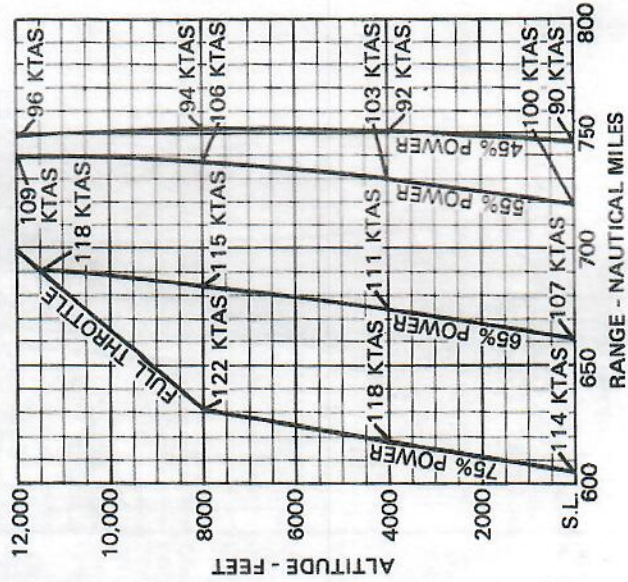


Figure 5-8. Range Profile (Sheet 2 of 2)

SECTION 5
PERFORMANCE

CESSNA
MODEL 172N

CESSNA
MODEL 172N

SECTION 5
PERFORMANCE

ENDURANCE PROFILE
45 MINUTES RESERVE
50 GALLONS USABLE FUEL

CONDITIONS:

2300 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTES:

1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb as shown in figure 5-6.
2. Reserve fuel is based on 45 minutes at 45% BHP and is 4.1 gallons.

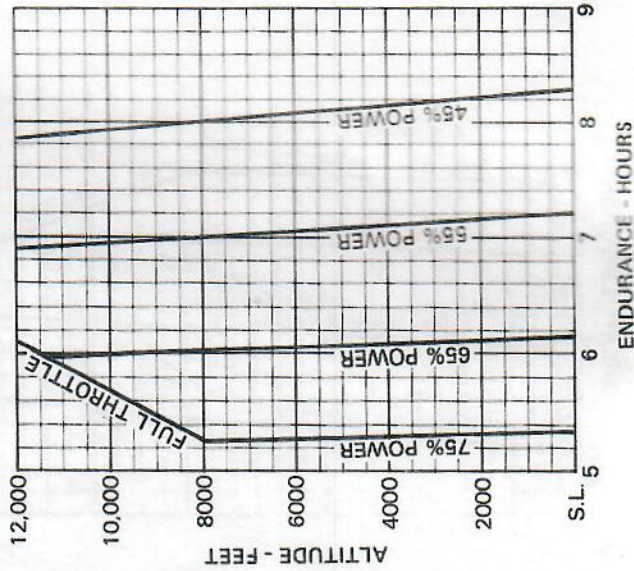


Figure 5-9. Endurance Profile (Sheet 2 of 2)

LANDING DISTANCE

SHORT FIELD

CONDITIONS:
Flaps 40°
Power Off
Maximum Braking
Paved, Level, Dry Runway
Zero Wind

- 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.

WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS FT	0°C		10°C		20°C		30°C		40°C	
			TOTAL TO CLEAR GRND 50 FT OBS ROLL	TOTAL TO CLEAR GRND 50 FT OBS ROLL	TOTAL TO CLEAR GRND 50 FT OBS ROLL	TOTAL TO CLEAR GRND 50 FT OBS ROLL	TOTAL TO CLEAR GRND 50 FT OBS ROLL	TOTAL TO CLEAR GRND 50 FT OBS ROLL				
2300	60	S.L.	1205	510	1235	530	1265	545	1295	565	1330	585
2000	510	530	1265	550	1300	570	1335	590	1370	610	1405	630
1000	510	530	1235	530	1265	550	1300	570	1335	590	1370	610
1000	510	530	1205	510	1235	530	1265	545	1295	565	1330	585
2000	530	550	1265	550	1300	570	1335	590	1370	610	1405	630
3000	550	570	1300	570	1335	590	1370	610	1405	630	1440	655
4000	570	590	1335	590	1370	615	1410	635	1445	655	1480	680
5000	590	615	1370	615	1415	635	1450	655	1485	680	1525	705
6000	615	640	1415	640	1455	660	1490	685	1535	710	1570	730
7000	640	665	1455	660	1495	685	1535	710	1575	730	1615	760
8000	665	690	1500	690	1540	710	1580	735	1620	760	1665	785

Figure 5-10. Landing Distance

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL 172N

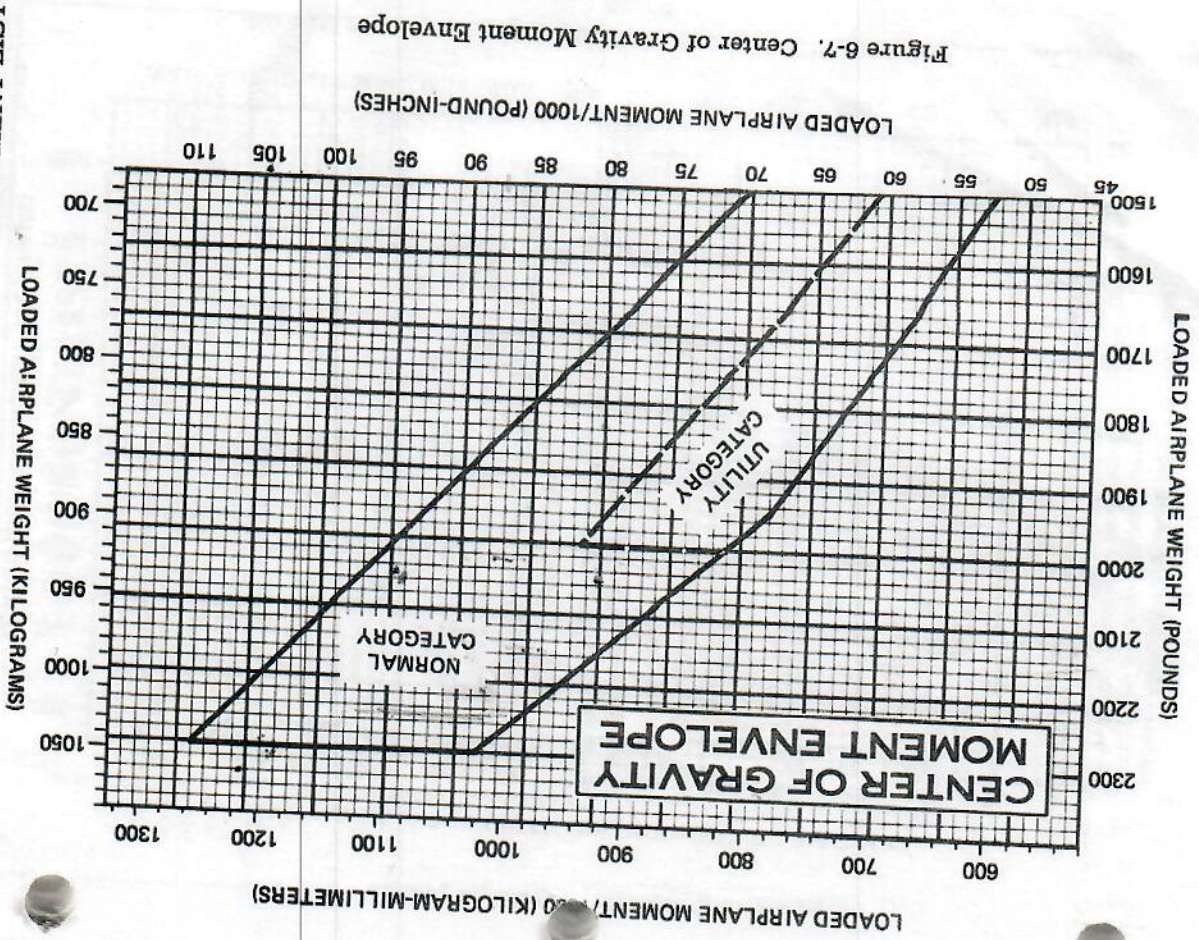
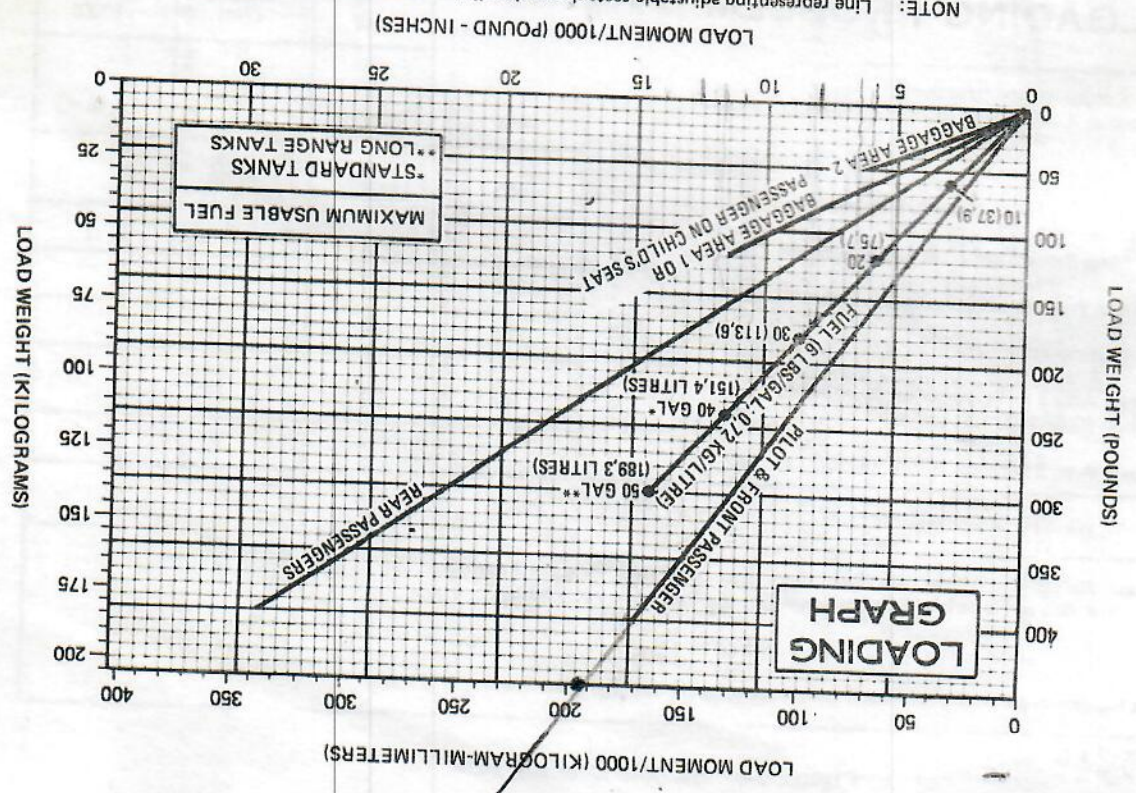


Figure 6-7. Center of Gravity Moment Envelope

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL 172N



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

SECTION 6
WEIGHT & BALANCE/
EQUIPMENT LIST

CESSNA
MODEL 172J

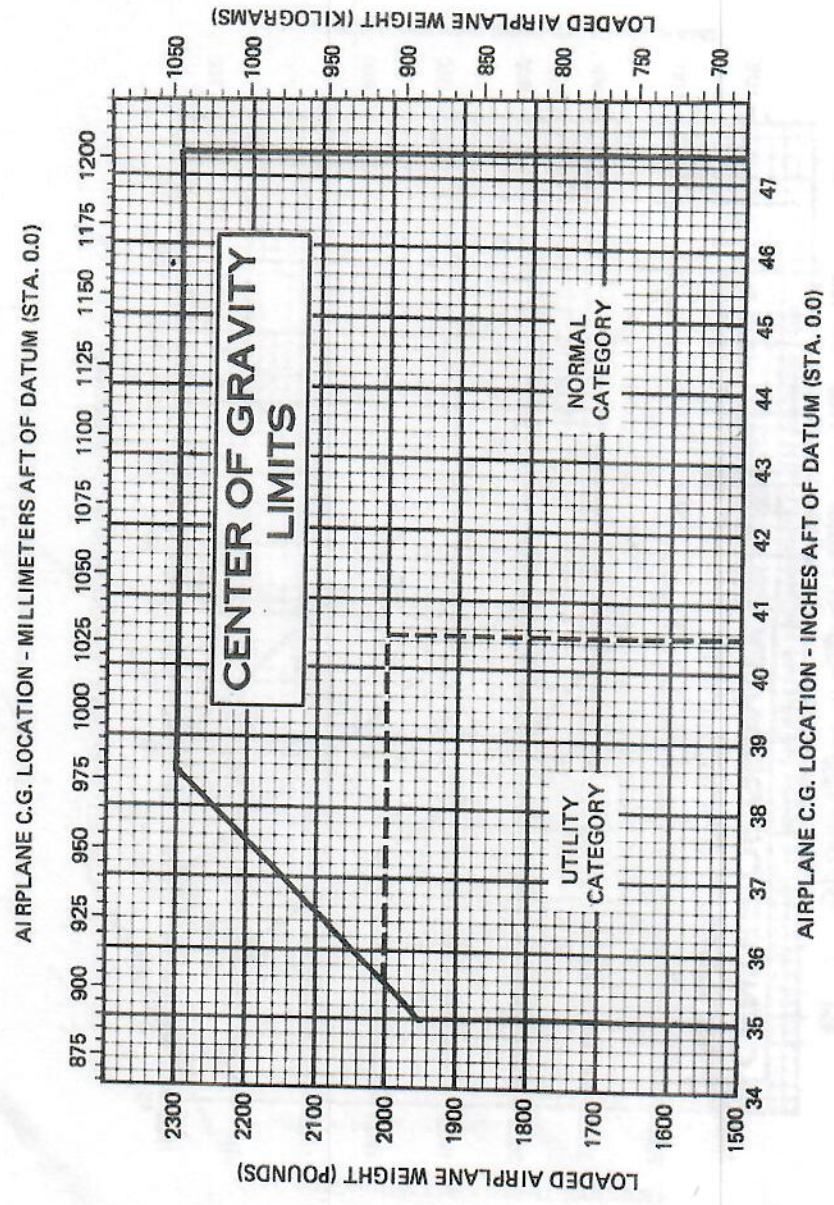


Figure 6-8 Center of Gravity Limits