



**FAA APPROVED  
SUPPLEMENTAL AIRPLANE FLIGHT MANUAL**

**Document Number 172051**

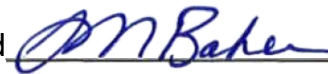
**For**

**Cessna 172D, E, F, G and H  
Serial No. 17249545 thru 17256512**

**Serial No:** \_\_\_\_\_ **Reg. Number:** \_\_\_\_\_

This supplement must be attached to the Owner's Handbook when **STC SA2196CE** (which increases the gross weight to **2500 lbs**) and **STC SA4428SW**, (which installs an O-360 Lycoming 180 HP engine), are installed.

The information contained herein supplements the information of the basic Owner's Handbook. For limitations, procedures, and performance information not contained in this supplement, consult the basic Owner's Handbook.

for FAA Approved  \_\_\_\_\_  
Margaret Kline  
Manager, Wichita Aircraft Certification Office  
FAA Central Region,  
Wichita, KS.

Date: 2/3/2012

Original Date: 07/17/2006

**LOG OF REVISIONS**

---

---

<b>Revision</b>	<b>Pages</b>	<b>Description</b>	<b>Date</b>	<b>Approved</b>
Original	1-14	New Issue	07/07/2006	W.Schinstock
1	1,2,4,17	Revised Logo, Propeller Information and tire requirements.	2/3/2012	<i>Don Baker</i>

## TABLE OF CONTENTS

<b>GENERAL .....</b>	<b>Section 1</b>
<b>LIMITATIONS .....</b>	<b>Section 2</b>
<b>EMERGENCY PROCEDURES.....</b>	<b>Section 3</b>
<b>NORMAL PROCEDURES .....</b>	<b>Section 4</b>
<b>PERFORMANCE.....</b>	<b>Section 5</b>
<b>WEIGHT &amp; BALANCE.....</b>	<b>Section 6</b>
<b>AIRPLANE AND SYSTEMS DESCRIPTIONS .....</b>	<b>Section 7</b>

---

---

### Note:

Limitation, procedures and performance information as listed above may not be contained in the original Owner's Handbook, however, the information is considered to be applicable to the models covered by this Supplement.

## **SECTION 1: GENERAL**

The information contained in this Owners Manual Supplement is applicable to the operation of the airplane in accordance with STC SA2196CE which increases the gross weight to 2500 lbs and STC SA4428SW which installs an O-360 Lycoming engine and a fixed pitch propeller

### **DESCRIPTIVE DATA**

#### **ENGINE**

Number of engines: 1.

Engine Manufacturer: Textron Lycoming.

Engine Model Number: O-360-A4A, A4M, A4N, A2F and A3A.

Engine Type: Normally aspirated, direct drive, air cooled, horizontally opposed, carburetor equipped, four cylinder engine with 360 cu. in. displacement.

Horsepower Rating and Engine Speed: 180 rated BHP at 2700 RPM maximum continuous rpm.

#### **PROPELLERS:**

##### **Sensenich Propellers approved on installations using the O-360-A4 series engines only**

Propeller Manufacturer: Sensenich Corporation

Propeller Model Number: 76EM8S14-0-60

Number of Blades: 2.

Propeller Diameter: Maximum..... 76 inches.

Minimum..... 76 inches.

Pitch Range: 62" to 56"

Propeller Manufacturer: Sensenich Corporation.

Propeller Model Number: 76EM8S-0-60 (when using MKA3.5 prop spacer).

Number of Blades: 2.

Propeller Diameter: Maximum:..... 76 inches.

Minimum:..... 76 inches.

Pitch Range: 62" to 56"

##### **Approved on all approved engine installations:**

Propeller Manufacturer: McCauley Accessory Division.

Propeller Model Number: 1A170/CFA  
1A170E/CFA

Number of Blades: 2.

Propeller Diameter: Maximum:..... 76 inches.

Minimum:..... 74.5 inches.

Propeller Type: Fixed Pitch

Pitch Range: 60" to 56"

**Approved on installations using the O-360-A4A, -A4M, -A4N, and A3A engines only:**

Propeller Manufacturer: McCauley Accessory Division.  
Propeller Model Number: 1A170/JFA

Number of Blades: 2  
Propeller Diameter: Maximum: ..... 76 inches.  
Minimum: ..... 74.5 inches.  
Propeller Type: Fixed Pitch  
Pitch Range: 60" to 56"

**STATIC RPM LIMITS**

2275-2450 RPM, Full Throttle (carburetor heat off, mixture leaned to maximum RPM).

**FUEL:**

Approved Fuel Grades (and colors)  
91/96 Grade Aviation Fuel  
100LL Grade Aviation Fuel (Blue)  
100 (formally 100/130) Grade Aviation Fuel (Green)

**OIL:**

Refer to Textron Lycoming Engine Operations Manual

**Oil Capacity:**

Sump: 8 Quarts  
Total: 9 Quarts (if oil filter installed)/

**MAXIMUM CERTIFICATED WEIGHTS**

Takeoff, Normal	.....	2500 lbs.
Utility	.....	2000 lbs.
Landing, Normal	.....	2500 lbs.
Utility	.....	2000 lbs.

## **SECTION 2: LIMITATIONS**

### **AIRSPEED INDICATOR MARKINGS**

Airspeed must be Air Plains Services airspeed PN: 1728803 or 1728803-1 or existing airspeed indicator remarked as follows:

<b>MARKING MPH</b>	<b>CAS VALUE OR RANGE</b>
White Arc.....	56-100 mph
Green Arc.....	64-145 mph
Yellow Arc .....	145-182 mph
Red Line.....	182 mph

### **AIRSPEED LIMITATIONS**

VA      Maneuvering Speed:  
            2500 Pounds ..... 122 MPH IAS

### **POWER PLANT LIMITATIONS**

#### **ENGINE**

Number of engines: 1.

Engine Manufacturer: Textron Lycoming.

Engine Model Number: O-360-A4A, A4M, A4N, A2F and A3A.

Engine Type: Normally aspirated, direct drive, air cooled, horizontally opposed, carburetor equipped, four cylinder engine with 360 cu. in. displacement.

Horsepower Rating and Engine Speed: 180 rated BHP at 2700 RPM maximum continuous rpm.

Engine Model Number: O-360-A2F, A3A, A4A, and A4M.

Maximum Power: 180 BHP rating

Maximum Continuous RPM: 2700 RPM

## POWER PLANT INSTRUMENT MARKINGS

Oil Temperature Gage	
Normal Operating Range .....	Green Arc.....100° - 245°F
Maximum Allowable .....	Red Line..... 245°F
Oil Pressure, Idling .....	Red Line..... 25 psi
Normal Operating.....	Green Arc..... 50 - 90 psi
Maximum .....	Red Line..... 90 psi
Warm up, Taxi and Takeoff.....	..... 115 psi

## WEIGHT LIMITS

Maximum Takeoff Weight: Normal .....	2500 lbs.
Utility.....	2000 lbs.
Maximum Landing Weight: Normal.....	2500 lbs.
Utility.....	2000 lbs.

## CENTER OF GRAVITY LIMITS

### NORMAL CATEGORY

Center of Gravity Range:	
Forward: 35 inches aft of datum at 1950 lbs. or less, with straight line variation to 40.5 inches aft of datum at 2500 lbs.	
Aft: 47.3 inches aft of datum at all weights.	

### UTILITY CATEGORY

Center of Gravity:	
Forward: 35 inches aft of datum at 1950 lbs. or less, with straight line variation to 35.5 inches aft of datum at 2000lbs.	
Aft: 40.5 inches aft of datum at all weights.	

## FLIGHT LOAD FACTORS

### NORMAL CATEGORY

Flight Load Factors (Maximum Takeoff Weight - 2500lbs.):  
Flaps Up ..... +3.8g, -1.52g  
Flaps Down.....+3.5g

### FUEL LIMITATIONS:

Approved Fuel Grades (and colors)  
91/96 Grade Aviation Fuel  
100LL Grade Aviation Fuel (Blue)  
100 (formally 100/130) Grade Aviation Fuel (Green)

### FLAP LIMITATIONS:

Limited to 30°

### PLACARDS:

#### Note

Only the placards listed below are changed from the FAA Approved Data.

Near the fuel tank filler cap (standard tanks)

**FUEL**  
**100LL/100 MIN. GRADE AVIATION**  
**GASOLINE**

On Oil Filler Cap or clearly marked on the dipstick::

**OIL**  
**8 QTS.**

On flap handle, models 172D through 172E

**Flaps – Pull Extend**  
**Take-Off Retract 0°**  
**1<sup>st</sup> Notch 10°**  
**Landing 0°-30°**  
**Avoid Slips With Flaps Down**



### **SECTION 3: EMERGENCY PROCEDURES**

#### **AIRSPEEDS FOR EMERGENCY OPERATION**

Engine Failure After Takeoff:

Wing Flaps Up ..... 77 – 86 MPH IAS

Wing Flaps Down..... 70 – 81 MPH IAS

Maneuvering Speed:

2500 lbs ..... 122 MPH IAS

2150 lbs ..... 109 MPH IAS

1750 lbs ..... 98 MPH IAS

Maximum Glide:

2500 LBS ..... 86 MPH IAS

Precautionary Landing With Engine Power ..... 76 MPH IAS

Landing Without Engine Power:

Wing Flaps Up ..... 77-86 MPH IAS

Wing Flaps Down..... 70-81 MPH IAS

#### **DITCHING**

If no power is available, approach at 76 MPH IAS with flaps at 30 °.

#### **FLIGHT IN ICING CONDITIONS**

Approach at 81 to 92 MPH IAS, depending on ice accumulation.

## **SECTION 4: NORMAL PROCEDURES**

### **NORMAL PROCEDURES**

#### **SPEEDS FOR NORMAL OPERATION**

Unless otherwise noted, the following speeds are based on a maximum weight of 2500 pounds and may be used for any lesser weight.

##### Takeoff:

Normal Climb Out .....	86-97 MPH IAS
Short Field Takeoff, Flaps 10 °, Speed at 50 ft .....	70 MPH IAS

##### Enroute Climb, Flaps Up:

Normal, Sea Level .....	86-97 MPH IAS
Normal, 10,000 Feet .....	79-90 MPH IAS
Best Rate of Climb, Sea Level .....	89 MPH IAS
Best Rate of Climb, 10,000 Feet .....	85 MPH IAS
Best Angle of Climb, Sea Level .....	73 MPH IAS

##### Landing Approach:

Normal Approach, Flaps Up .....	77-86 MPH IAS
Normal Approach, Flaps 30 ° .....	70-81 MPH IAS

##### Balked Landing:

Maximum Power, Flaps 20 ° .....	70 MPH IAS
---------------------------------	------------

##### Maximum Recommended Turbulent Air Penetration Speed:

2500 lbs .....	122 MPH IAS
2150 lbs .....	109 MPH IAS
1750 lbs .....	98 MPH IAS

## SECTION 5: PERFORMANCE

Unless otherwise addressed in this flight manual supplement the **Performance Numbers** covered in the Aircraft Owners Handbook are considered to be equal to or better than the listed numbers.

### TAKE-OFF DATA

#### CONDITION

Flaps down 10 °

TAKE-OFF TAKE OFF DISTANCE FROM HARD SURFACE RUNWAY											
MODEL	GROSS WEIGHT LBS	IAS AT 50 FT. MPH	HEAD WIND KNOTS	@ S.L. & 59° F		@ 2500 ft & 50° F		@ 5000 ft & 41° F		@ 7500 ft & 32° F	
				GROUND ROLL	TOTAL To Clear 50' OBS.	GROUND ROLL	TOTAL To Clear 50' OBS.	GROUND ROLL	TOTAL To Clear 50' OBS.	GROUND ROLL	TOTAL To Clear 50' OBS.
180HP 172 D-H	1900	61	0	320	715	380	820	460	960	545	1115
			10	205	520	245	600	300	710	365	830
			20	110	345	140	405	175	485	220	580
	2200	65	0	445	935	535	1085	645	1290	770	1525
			10	295	690	355	810	440	970	530	1160
			20	170	475	215	565	270	690	335	835
	2500	70	0	600	1205	720	1420	875	1715	1050	2080
			10	405	905	495	1075	610	1315	745	1610
			20	250	640	310	770	390	955	485	1190

NOTE: 1- Increase distance 10% for each 25°F above standard temperature for particular altitude

### LANDING DISTANCE - SHORT FIELD

#### CONDITION

Flaps down 30 °

LANDING DATA LANDING DISTANCE ON HARD SURFACE RUNWAY, NO WIND										
MODEL	GROSS WEIGHT LBS	APPROACH IAS MPH	@ S.L. & 59° F		@ 2500 ft & 50° F		@ 5000 ft & 41° F		@ 7500 ft & 32° F	
			GROUND ROLL	TOTAL To Clear 50' Obs.	GROUND ROLL	TOTAL To Clear 50' Obs.	GROUND ROLL	TOTAL To Clear 50' Obs.	GROUND ROLL	TOTAL To Clear 50' Obs.
180HP 172 D-H	1900	60	500	980	520	1030	550	1080	580	1140
	2200	64	560	1100	590	1155	620	1220	660	1290
	2500	69	610	1200	640	1260	685	1335	725	1410

## TALLING SPEED

STALLING SPEED (MPH - CAS)						
MODEL	GROSS WEIGHT LBS	FLAPS	ANGLE OF BANK			
			0° BANK	20° BANK	40° BANK	60° BANK
180HP 172 D-H	2500	FLAPS UP	59	62	68	84
		FLAPS 10	540	56	62	77
		FLAPS 30	51	53	58	72

## CRUISE FUEL CONSUMPTION (Not FAA Approved)

**Conditions:**

2500 Pounds

Recommended Lean Mixture

Press. Alt Feet	RPM	20°C Below Standard Temp.		Standard Temperature		20°C Above Standard Temp.	
		% BHP	GPH	% BHP	GPH	% BHP	GPH
<b>2000</b>	<b>2550</b>	---	---	<b>76</b>	<b>10.2</b>	<b>72</b>	<b>9.6</b>
	2500	77	10.3	72	9.6	68	9.1
	2400	69	9.2	64	8.7	61	8.3
	2300	61	8.3	58	7.9	55	7.6
	2200	55	7.5	52	7.2	49	6.9
	2100	49	6.8	46	6.6	43	6.3
<b>4000</b>	<b>2600</b>	---	---	<b>76</b>	<b>10.2</b>	<b>72</b>	<b>9.6</b>
	2500	73	9.7	68	9.2	65	8.7
	2400	65	8.8	62	8.3	58	8.0
	2300	58	8.0	55	7.6	52	7.3
	2200	52	7.3	49	6.9	47	6.6
	2100	46	6.6	44	6.3	41	6.1
<b>6000</b>	<b>2650</b>	---	---	<b>76</b>	<b>10.1</b>	<b>72</b>	<b>9.6</b>
	2600	77	10.3	72	9.6	68	9.1
	2500	69	9.3	65	8.8	62	8.4
	2400	62	8.4	59	8.0	56	7.6
	2300	56	7.7	53	7.3	50	7.0
	2200	50	7.0	47	6.7	44	6.4
<b>8000</b>	<b>2700</b>	---	---	<b>76</b>	<b>10.1</b>	<b>71</b>	<b>9.5</b>
	2600	73	9.8	69	9.2	65	8.7
	2500	66	8.8	62	8.4	59	8.0
	2400	59	8.1	56	7.7	53	7.3
	2300	53	7.4	50	7.0	47	6.7
	2200	47	6.7	45	6.4	42	6.1
<b>10,000</b>	<b>2700</b>	<b>77</b>	<b>10.2</b>	<b>72</b>	<b>9.6</b>	<b>68</b>	<b>9.1</b>
	2600	69	9.3	65	8.8	62	8.4
	2500	63	8.5	59	8.1	56	7.7
	2400	57	7.8	53	7.4	50	7.0
	2300	51	7.1	48	6.8	45	6.5
<b>12,000</b>	<b>2700</b>	<b>69</b>	<b>9.3</b>	<b>65</b>	<b>8.8</b>	<b>62</b>	<b>8.4</b>
	2600	66	8.9	62	8.4	59	8.0
	2500	60	8.2	56	7.7	53	7.4
	2400	54	7.5	51	7.1	48	6.7
	2300	48	6.8	45	6.5	42	6.2

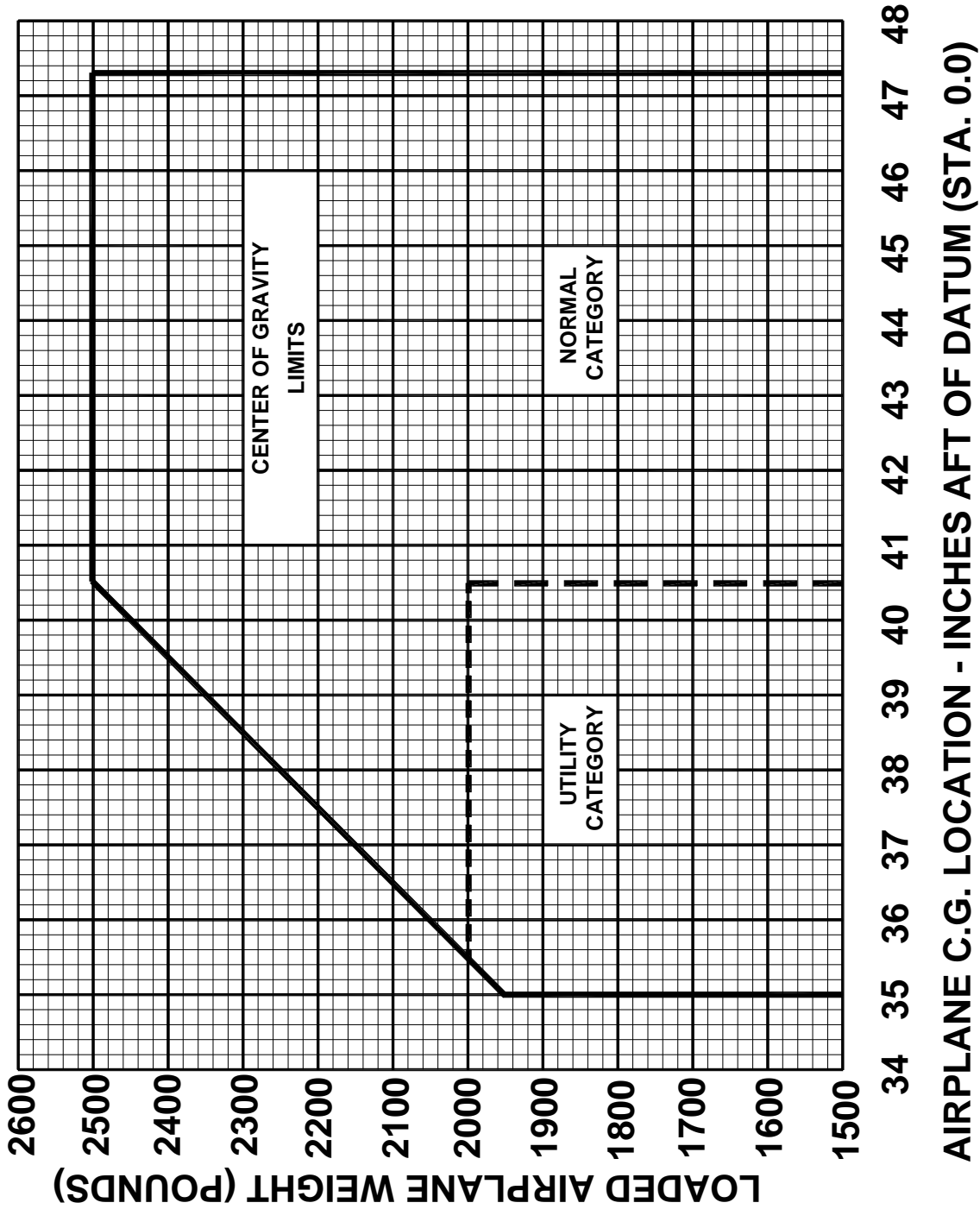
## **RANGE PROFILE**

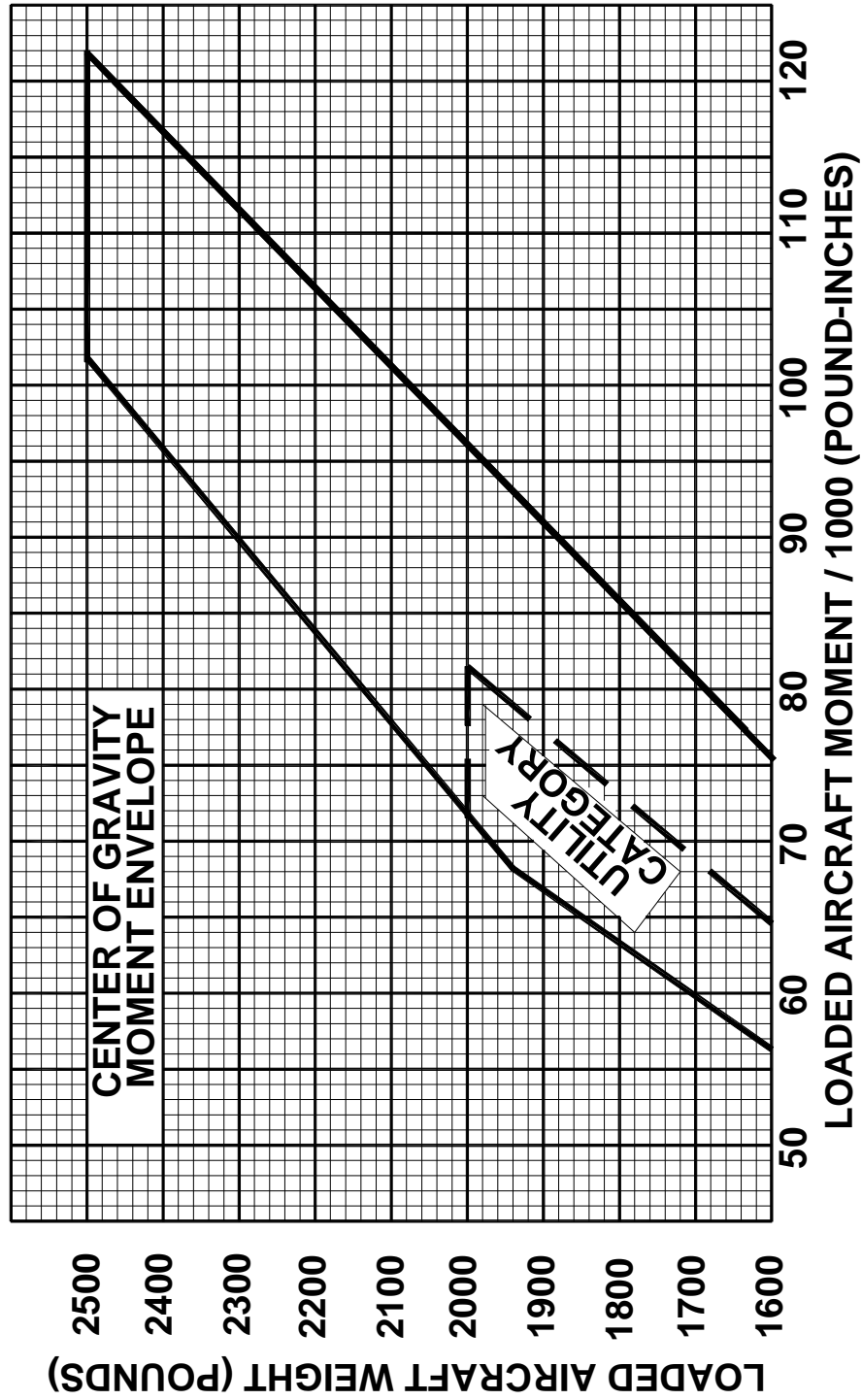
Compute range based on the available fuel load on the aircraft, altitude, ground speed and engine fuel consumption.

## **ENDURANCE PROFILE**

Compute endurance based on the available fuel load on the aircraft and engine fuel consumption.,

**SECTION 6: WEIGHT AND BALANCE**







## **SECTION 7: AIRPLANE & SYSTEMS DESCRIPTIONS**

### **ENGINE:**

Refer to Textron Lycoming Operators Manual #60297-12 for a description of the engine and related components.

### **PROPELLER:**

Fixed pitch propeller 76" in diameter.

### **TIRES:**

To operate at the 2500 gross weight, the aircraft must be equipped with 6 or more ply tires on both the main wheels and nose wheel on all models.

- Tire Pressure should be:
  - ◆ Nose Gear .....45psi
  - ◆ Main Gear .....38psi