



**FAA Approved  
Supplemental Airplane Flight Manual**

**DOCUMENT NUMBER 172056**


**For**

**Cessna 172 M & N**

**Serial No. 17265685 to 17271034**

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

The information contained in this flight manual is FAA Approved Material, which, Along with the FAA Approved placards and instrument markings, is applicable to the operation of the airplane when modified in accordance with STC 2196CE, which increases the maximum certificated takeoff weight to 2550 LBS and limits the flap travel to 30 degrees. The airplane must previously have been modified in accordance with ATS SA4428SW which installs a 180HP Lycoming O-360 series and a fixed pitch propeller.

*for* FAA Approved   
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Date: 2/3/2012

Original Date: 09/25/86

## LOG OF REVISIONS

Revision	Page	Description	Approved	Date
Orig	All	Original Issue	-	09/25/86
1	1-10	Changed Page Numbers Revised Cover Sheet Added Engine Models	G.M. Baker	10/02/87
2	1-10	Added M Models Changed name to Air Plains Services, Corp	G. M. Baker	07/06/88
3	3 & 4	Added O-360-A4N	B.L. Sorensen	3/21/90
4	All	Reformatted, Added Document Number, Moved Table of Contents from Cover Page and Included Section Applicability, Added Propellers, Added Fuel Consumption Chart, Added Section 7 Handling Service And Maintenance	<i>G.M. Baker</i>	<i>2/3/2012</i>

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## **SECTION 1: GENERAL**

### **DESCRIPTIVE DATA**

#### **ENGINE**

Engine Model Number: O-360-A2F, A3A, A4A, A4M, and A4N  
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 2700RPM.  
Maximum Continuous RPM: 2700 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"

**MAXIMUM CERTIFICATED WEIGHTS**

Takeoff,	Normal.....	2550 lbs.
	Utility .....	2000 lbs.
Landing,	Normal.....	2550 lbs.
	Utility .....	2000 lbs.

## **SECTION 2: LIMITATIONS**

### **AIRSPPEED INDICATOR MARKINGS**

Air Plains Services PN: 172861 or 172861-2 or existing airspeed indicator, marked as follows:

<b>MARKING</b>	<b>KIAS VALUE OR RANGE</b>
White Arc .....	40-85
Green Arc.....	50-127
Yellow Arc.....	127-158
Red Line .....	158

### **AIRSPPEED LIMITATIONS**

VA	Maneuvering Speed:	
	2550 Pounds .....	105 KIAS
	2150 Pounds .....	95 KIAS
	1750 Pounds .....	85 KIAS

### **POWER PLANT LIMITATIONS**

Engine Model Number: O-360-A2F, A3A, A4A, A4M and A4N  
 Maximum Power: 180 BHP rating  
 Maximum Continuous RPM: 2700 RPM

Static RPM Limits: 2250 to 2450 RPM

### **WEIGHT LIMITS**

Maximum Takeoff Weight,	
Normal .....	2550 lbs.
Utility .....	2000 lbs.
Maximum Landing Weight,	
Normal .....	2550 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 41.0 inches aft of datum at 2550 lbs.

Aft: 47.3 inches aft of datum at all weights.

### **UTILITY CATEGORY**

Center of Gravity:

Forward: 35 inches aft of datum at 1950lbs. 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 - 2550 lbs.):

Flaps Up ..... +3.8g, -1.52g

Flaps Down..... +3.0g

## **PLACARDS**

10 . Near airspeed indicator:

**MANEUVER SPEED - 105 KIAS**

## **SECTION 3: EMERGENCY PROCEDURES**

### **AIRSPEEDS FOR EMERGENCY OPERATION**

Engine Failure after Takeoff:	
Wing Flaps Up .....	70 KIAS
Wing Flaps Down.....	65 KIAS
Maneuvering Speed:	
2550 lbs .....	105 KIAS
2150 lbs .....	95 KIAS
1750 lbs .....	85 KIAS
Maximum Glide:	
2550 lbs .....	68 KIAS
2150 lbs .....	62 KIAS
1750 lbs .....	56 KIAS
Precautionary Landing With Engine Power .....	65 KIAS
Landing Without Engine Power:	
Wing Flaps Up .....	70 KIAS
Wing Flaps Down.....	65 KIAS

### **ENGINE FAILURES**

#### **ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF**

1. Airspeed .....
- |                      |
|----------------------|
| 70 KIAS (Flaps Up)   |
| 65 KIAS (Flaps Down) |

#### **ENGINE FAILURE DURING FLIGHT**

1. Airspeed .....
- |         |
|---------|
| 75 KIAS |
|---------|

### **FORCED LANDINGS**

#### **EMERGENCY LANDING WITHOUT ENGINE POWER**

1. Airspeed .....
- |                      |
|----------------------|
| 70 KIAS (Flaps Up)   |
| 65 KIAS (Flaps Down) |
5. Wing Flaps .....
- |                               |
|-------------------------------|
| AS REQUIRED (30° recommended) |
|-------------------------------|

#### **PRECAUTIONARY LANDING WITH ENGINE POWER**

2. Airspeed.....
- |         |
|---------|
| 65 KIAS |
|---------|
5. Wing Flaps .....
- |                          |
|--------------------------|
| 30° (on final approach). |
|--------------------------|
6. Airspeed.....
- |         |
|---------|
| 65 KIAS |
|---------|





## DITCHING

4. Wing Flaps .....20-30°

### NOTE

If no power is available, approach at 70 KIAS with flaps up or at 65 KIAS with 10° flaps.

## ICING

### INADVERTENT ICING ENCOUNTER

11. Approach at 80 to 90 KIAS depending upon the amount of the accumulation.

## **SECTION 4. NORMAL PROCEDURES**

### **NORMAL PROCEDURES**

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

Unless otherwise noted, the following speeds are based on a maximum weight of 2550 pounds and may be used for any lesser weight.

#### **Takeoff**

Normal Climb Out.....75-85 KIAS  
 Short Field Takeoff, Flaps 10°, Speed at 50 Feet .....57 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 ..... 72 KIAS  
 Best Angle of Climb, Sea Level.....62 KIAS  
 Best Angle of Climb, 10,000 Feet.....67 KIAS

#### **Landing Approach:**

Normal Approach, Flaps Up .....65-75 KIAS  
 Normal Approach, Flaps 30° .....60-70 KIAS  
 Short Field Approach, Flaps 30° ..... 62 KIAS

#### **Balked Landing:**

Maximum Power, Flaps 20° ..... 60 KIAS

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

2550 Lbs ..... 105 KIAS  
 2150 Lbs ..... 95 KAIS  
 1750 Lbs ..... 85 KIAS

### **SHORT FIELD TAKEOFF**

Climb Speed ..... 57 KIAS (until all obstacles are cleared)

### **ENROUTE CLIMB**

Airspeed ..... 75-85 KIAS

## 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)

### SHORT FIELD LANDING

1. Airspeed..... 65-75 KIAS (Flaps Up)
2. Wing Flaps ..... FULL DOWN (30°)
3. Airspeed..... 62 KIAS (until flare)

### BALKED LANDING

5. Wing Flaps ..... 10° (until obstacles are cleared)  
RETRACT SLOWLY after reaching a safe altitude and 65 KIAS.

## SECTION 5: PERFORMANCE

### LANDING DISTANCE - SHORT FIELD

**CONDITIONS:**

Flaps 30°

**NOTES:**

If a landing with flaps up is necessary, increase approach speed by 9 KIAS and allow for 35% longer distance.

Weight LBS	Speed At 50 Ft KIAS	Press Alt Ft	0°C		10°C		20°C		30°C		40°C	
			Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs	Grnd Roll Ft	Total Ft To Clear 50 Ft Obs
2550	62	S.L	545	1290	565	1320	585	1350	605	1380	625	1415
		1000	565	1320	585	1350	605	1385	625	1420	650	1450
		2000	585	1355	610	1385	630	1420	650	1455	670	1490
		3000	610	1385	630	1425	655	1460	675	1495	695	1530
		4000	630	1425	655	1460	675	1495	700	1535	725	1570
		5000	655	1460	680	1500	705	1535	725	1575	750	1615
		6000	680	1500	705	1540	730	1580	755	1620	780	1660
		7000	705	1545	730	1585	760	1625	785	1665	810	1705
		8000	735	1585	760	1630	790	1670	815	1715	840	1755

## CRUISE FUEL CONSUMPTION

(Not FAA Approved)

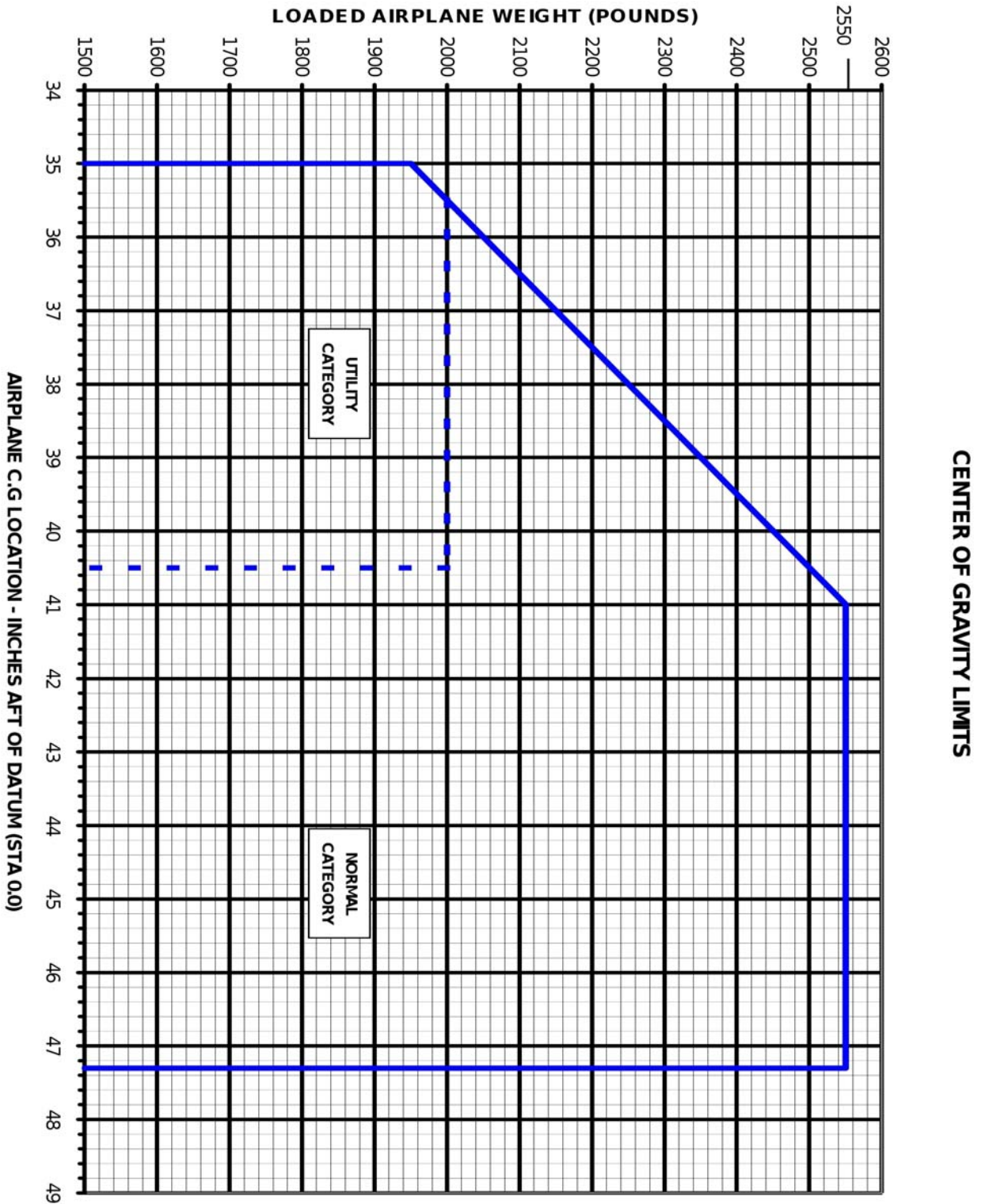
### Conditions:

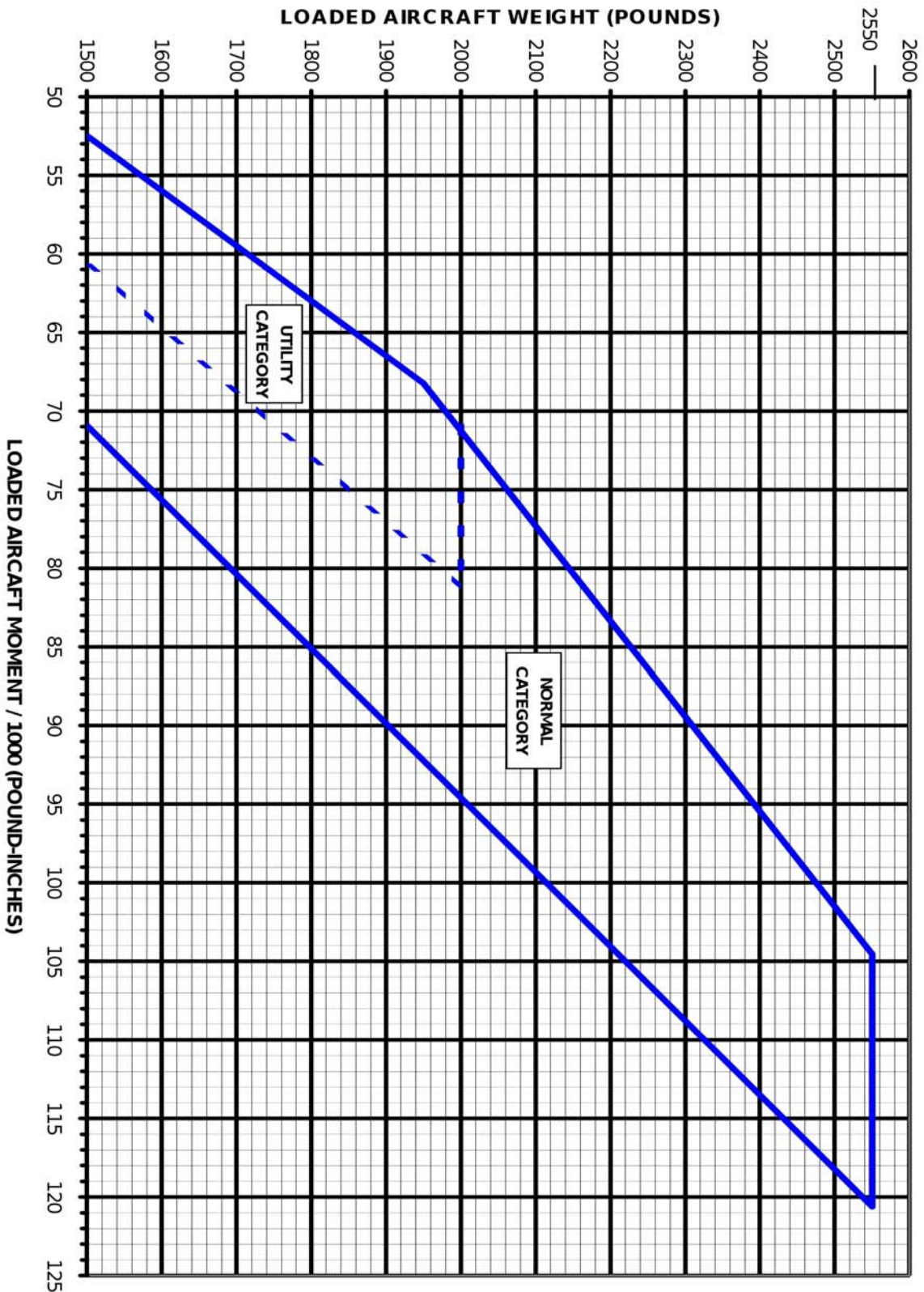
2550 Pounds

Recommended Lean Mixture		20°C Below Standard Temp.		Standard Temperature		20°C Above Standard Temp.	
Press. Alt Feet	RPM	% 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
	2200	47	6.7	45	6.4	42	6.1
<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



## **SECTION 6: WEIGHT AND BALANCE**







## **SECTION 7: HANDLING, SERVICE AND MAINTENANCE**

To operate at the 2550 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 .....45 psi
  - ◆ Main Gear .....38 psi