

734NK

A/C



Supplemental Airplane Flight Manual
Cessna 172 M & N
FAA Approved STC SA2196CE
www.airplains.com



**FAA Approved
Supplemental Airplane Flight Manual**

DOCUMENT NUMBER 172056

For

Cessna 172 M & N

Serial No. 17265685 to 17271034

Serial No: 17268982 Reg. #: N734NK

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.

FAA Approved *M Baker*
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Manager, Wichita Aircraft Certification Office
FAA Central Region
Wichita, KS

Date: 2/3/2012

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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>



TABLE OF CONTENTS

SECTION 1: GENERAL.....	4
SECTION 2: LIMITATIONS	6
SECTION 3: EMERGENCY PROCEDURES.....	8
SECTION 4. NORMAL PROCEDURES	10
SECTION 5: PERFORMANCE	12
SECTION 6: WEIGHT AND BALANCE.....	14
SECTION 7: HANDLING, SERVICE AND MAINTENANCE.....	17

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

AIRSPEED INDICATOR MARKINGS

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

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

AIRSPEED 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

- Airspeed 70 KIAS (Flaps Up)
65 KIAS (Flaps Down)

ENGINE FAILURE DURING FLIGHT

- Airspeed 75 KIAS

FORCED LANDINGS

EMERGENCY LANDING WITHOUT ENGINE POWER

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

PRECAUTIONARY LANDING WITH ENGINE POWER

- Airspeed..... 65 KIAS
- Wing Flaps..... 30° (on final approach).
- Airspeed..... 65 KIAS



DITCHING

4. Wing Flaps20-30°

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
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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)
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ENROUTE CLIMB

Airspeed	75-85 KIAS
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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:

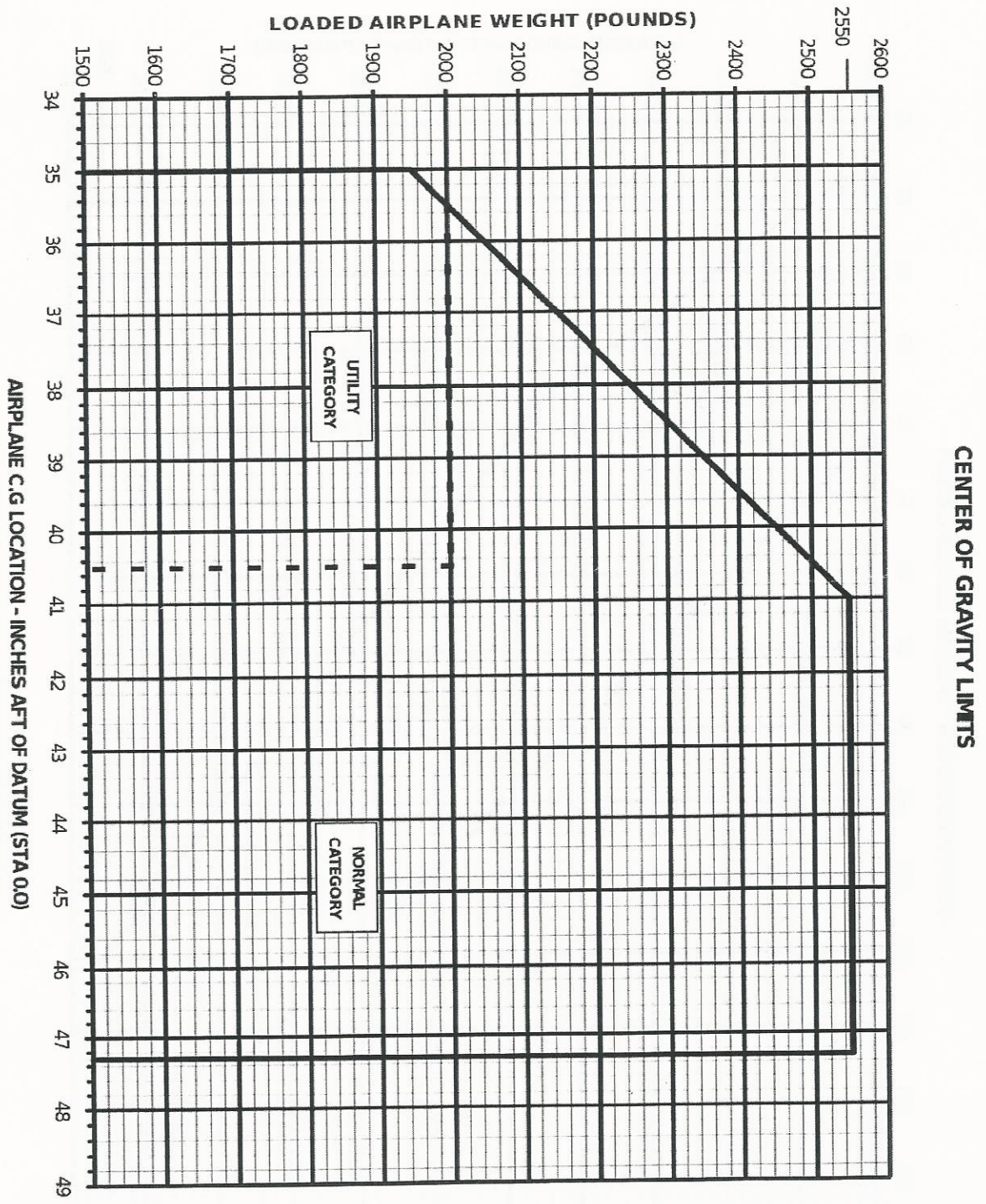
2550 Pounds

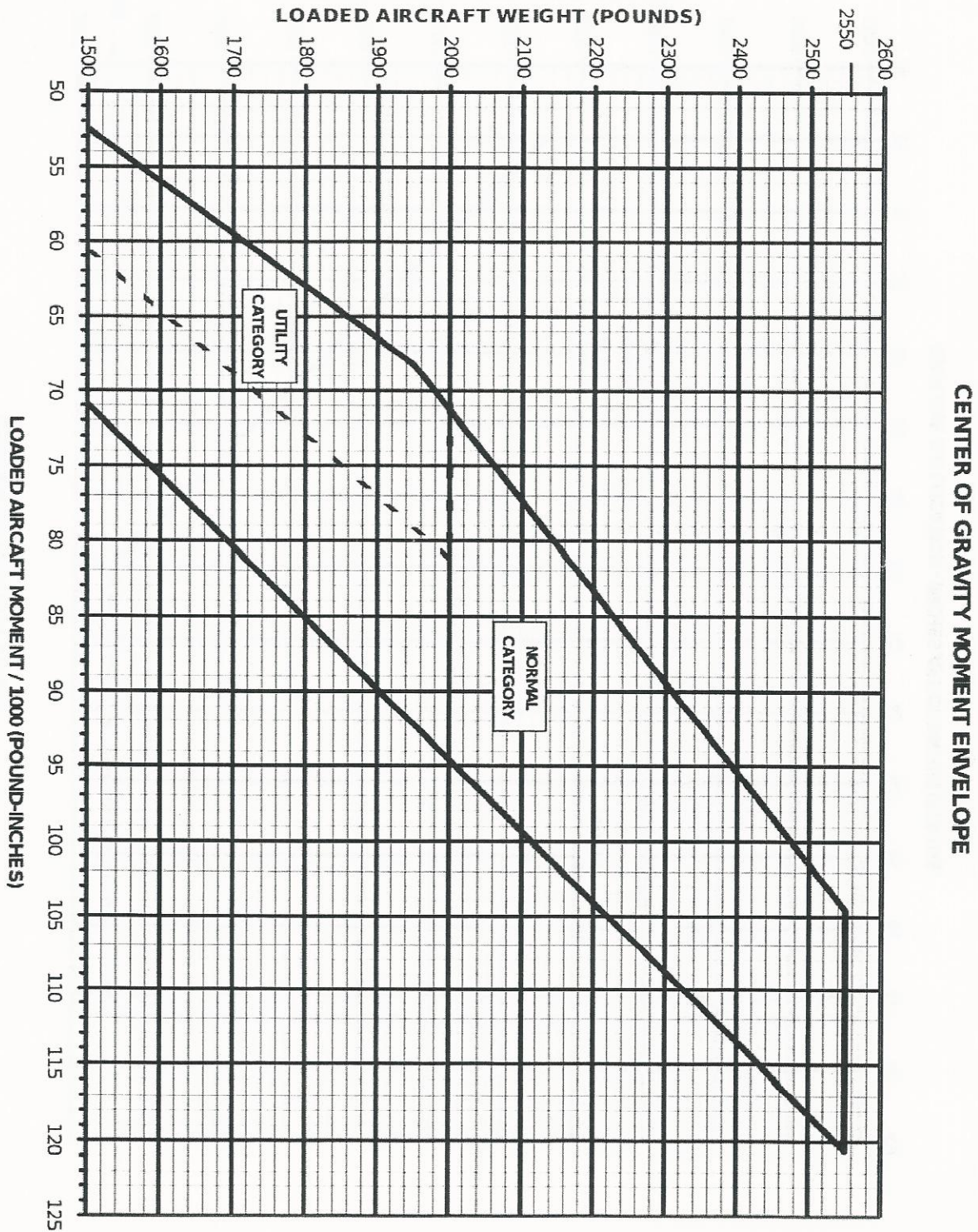
Recommended Lean Mixture		20°C Below Standard Temp.		Standard Temperature		20°C Above Standard Temp.	
Press. Alt Feet	RPM	% BHP	GPH	% BHP	GPH	% BHP	GPH
2000	2550	---	---	76	10.2	72	9.6
	2500	77	10.3	72	9.6	68	9.1
	2400	69	9.2	64	8.7	61	8.3
	2300	61	8.3	58	7.9	55	7.6
	2200	55	7.5	52	7.2	49	6.9
4000	2100	49	6.8	46	6.6	43	6.3
	2600	---	---	76	10.2	72	9.6
	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
6000	2200	52	7.3	49	6.9	47	6.6
	2100	46	6.6	44	6.3	41	6.1
	2650	---	---	76	10.1	72	9.6
	2600	77	10.3	72	9.6	68	9.1
	2500	69	9.3	65	8.8	62	8.4
8000	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
	2700	---	---	76	10.1	71	9.5
	2600	73	9.8	69	9.2	65	8.7
10,000	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
	2700	77	10.2	72	9.6	68	9.1
12,000	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
	2700	69	9.3	65	8.8	62	8.4
	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

A large, empty grid table intended for weight and balance calculations, consisting of approximately 10 columns and 20 rows.





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 Gear45 psi
 - ◆ Main Gear38 psi