AIRPLANE WEIGHING FORM

B4073

Locating CG with Airplane on Landing Gear

$$X \text{ (Inches Aft of Datum)} = A - \left[\frac{\text{Nosewheel Weight} \times B}{\text{Total Weight*}}\right]$$

*(Nose + L + R Wheel Weights)

Locating Percent MAC

$$\text{CG Percent MAC} = \frac{(\text{CG Arm of Airplane}) - 25.90}{0.5880}$$

Leveling Provisions

Longitudinal – Left side of tailcone at FS 108.00 and 142.00

Measuring A and B

Measure A and B per pilot's operating handbook instructions to assist in locating CG with airplane weighed on landing gear.

Airplane as Weighed Table

Position	Scale reading	Scale drift	Tare	Net weight
Left Wheel				
Right Wheel				
Nose Wheel				
Airplane total as weighed				

Basic Empty Weight and Center-of-Gravity Table

Item	Weight Pounds	CG Arm (Inches)	Moment (Inch-Pounds /1000)
Airplane (calculated or as weighed) (includes all undrainable fluids and full oil)			
Drainable unusable fuel at 6.0 pounds per gallon – (3 gallons)	18.0	46.00	0.83
Basic Empty Weight	1774,25	41,98	74475,28

Figure 6-1 (Sheet 2) 21.03.07 CH

SAMPLE WEIGHT AND BALANCE RECORD

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SAMPLE WEIGHT AND BALANCE RECORD

(Continuous history of changes in structure or equipment affecting weight and balance)

Airplane model				Serial number						Page number	
Date	Item no.		Description of article or modification	Weight change						Running basic empty weight	
				Added (+)			Removed (-)				
	In	Out		WT. (lb.)	Arm (in.)	Moment /1000	WT. (lb.)	Arm (in.)	Moment /1000	WT. (lb.)	Moment /1000
12/06			As delivered							1761	73481
12/06	6			1325	75.04	99.428				1774	74.7528

0585T1009

Figure 6-2

WEIGHT AND BALANCE

The following information will enable you to operate your Cessna within the prescribed weight and center-of-gravity limitations. To determine weight and balance, use the Sample Loading Problem (Figure 6-3), Loading Graph (Figure 6-4), and Center-of-Gravity Moment Envelope (Figure 6-7) as follows:

Enter the appropriate basic empty weight and moment/1000 from the weight and balance records for your airplane in the YOUR AIRPLANE column of the Sample Loading Problem.

NOTE

In addition to the basic empty weight and moment noted on these records, the C.G. arm (FS) is also shown, but need not be used on the Sample Loading Problem. The moment which is shown must be divided by 1000 and this value used as the moment/1000 on the loading problem.

Use the Loading Graph to determine the moment/1000 for each additional item to be carried; then list these on the loading problem.

NOTE

Loading Graph information for the pilot, passengers and baggage is based on seats positioned for average occupants and baggage loaded in the center of the baggage areas as shown on the Loading Arrangements diagram. For loadings which may differ from these, the Sample Loading Problem lists fuselage stations (FS) for these items to indicate their forward and aft C.G. range limitations (seat travel and baggage area limitation). Refer to Figures 6-5 and 6-6 for additional loading information. Additional moment calculations, based on the actual weight and C.G. arm (FS) of the item being loaded, must be made if the position of the load is different from that shown on the Loading Graph.

(Continued Next Page)

WEIGHT AND BALANCE (Continued)

Total the weights and moments/1000 and plot these values on the Center of Gravity Moment Envelope to determine whether the point falls within the envelope, and if the loading is acceptable.

BAGGAGE TIEDOWN

A nylon baggage net having four tiedown straps is provided as standard equipment to secure baggage on the cabin floor aft of the rear seat (baggage area A) and in the aft baggage area (baggage area B). Six eyebolts serve as attaching points for the net. Two eyebolts for the forward tiedown straps are mounted on the cabin floor near each sidewall just forward of the baggage door approximately at station FS 90; two eyebolts are installed on the cabin floor slightly inboard of each sidewall approximately at FS 107; and two eyebolts are located below the aft window near each sidewall approximately at FS 107. A placard on the baggage door defines the weight limitations in the baggage areas.

When baggage area A is utilized for baggage only, the two forward floor mounted eyebolts and the two aft floor mounted eyebolts (or the two eyebolts below the aft window) may be used, depending on the height of the baggage. When baggage is carried in the baggage area B only, the aft floor mounted eyebolts and the eyebolts below the aft window should be used. When baggage is loaded in both areas, all six eyebolts should be utilized.

SAMPLE LOADING PROBLEM

ITEM DESCRIPTION	WEIGHT AND MOMENT TABULATION			
	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (Lbs.)	Moment (Lb-ins. /1000)	Weight (Lbs.)	Moment (Lb-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	1642	62.6	1774,25	74475,28
2. Usable Fuel (At 6 Lbs./Gal.)				
Standard Fuel 53 Gallons Maximum				
Reduced Fuel (30 Gallons)	180	8.6		
3. Pilot and Front Passenger (FS 32 to 50)	340	12.6		
4. Rear Passengers (FS 74)	340	24.8		
5.* Baggage "A" (FS 82 to 108) 120 Pounds Maximum	56	4.6		
6.* Baggage "B" (FS 108 to 142) 50 Pounds Maximum				
7. **RAMP WEIGHT AND MOMENT**	2558	113.2		
8. Fuel allowance for engine start, taxi and runup	-8.0	-0.4		
9. **TAKEOFF WEIGHT AND MOMENT** (Subtract Step 8 from Step 7)	2550	112.8		

10. Locate this point (2550 at 112.8) on the Center-of-Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable.

* The maximum allowable combined weight capacity for baggage in areas A and B is 120 pounds.

Figure 6-3 (Sheet 1 of 2)

SAMPLE LOADING PROBLEM

YOUR AIRPLANE		YOUR AIRPLANE		YOUR AIRPLANE	
Weight (lbs.)	Moment (Lb-ins, /1000)	Weight (lbs.)	Moment (Lb-ins, /1000)	Weight (lbs.)	Moment (Lb-ins, /1000)

When several loading configurations are representative of your operations, it may be useful to fill out one or more of the above columns so that specific loadings are available at a glance.

Figure 6-3 (Sheet 2)

LOADING GRAPH

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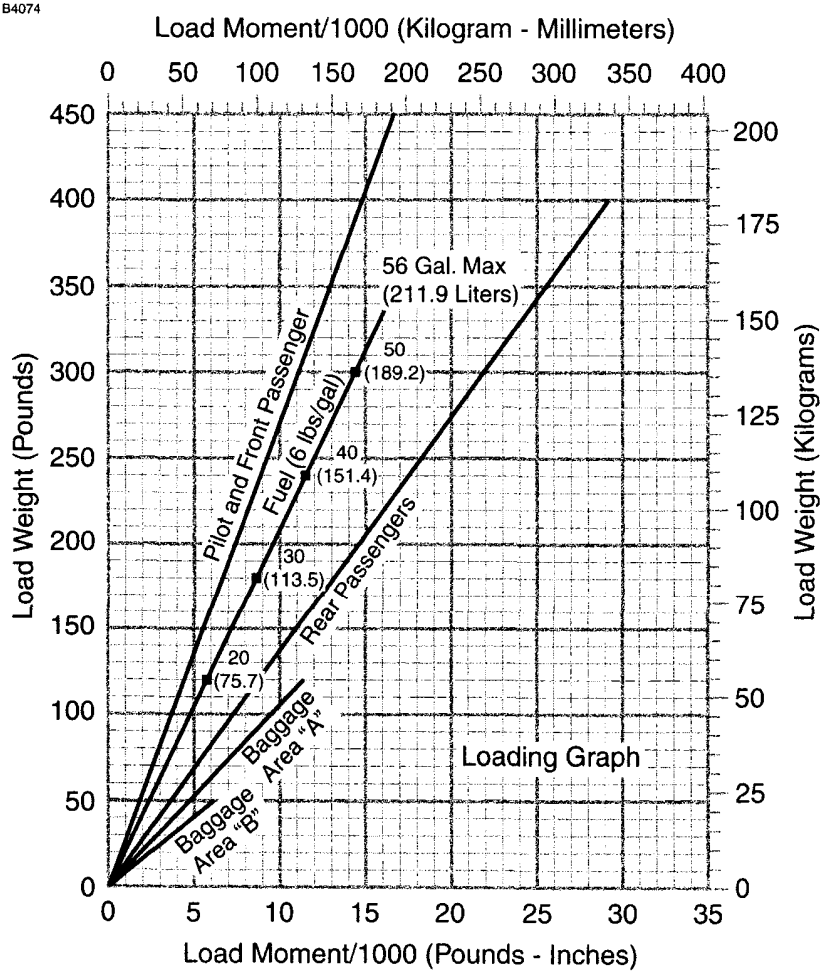
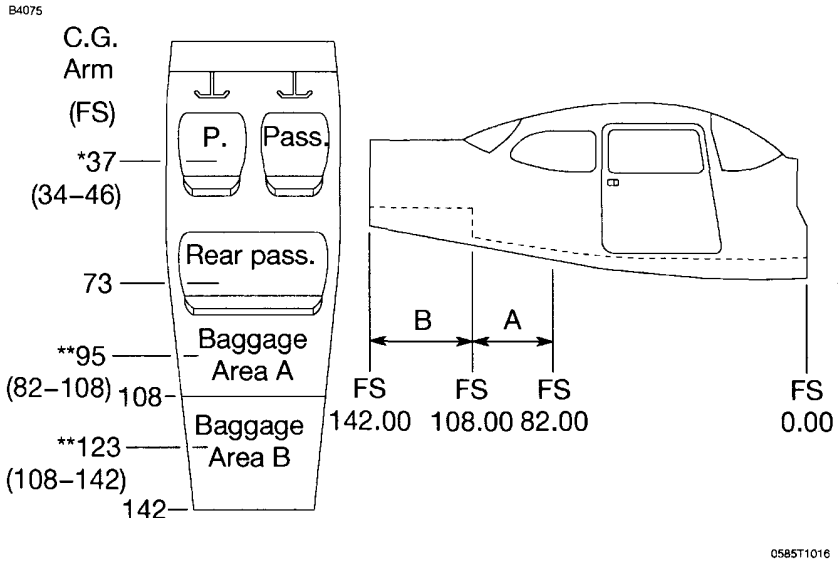


NOTE

Lines representing adjustable seats show 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 6-4

LOADING ARRANGEMENTS



* Pilot or passenger center-of-gravity on adjustable seats positioned for average occupant. Numbers in parentheses indicate forward and aft limits of occupant center-of-gravity range.

** Arms measured to the center of the areas shown.

NOTE

- The usable fuel C.G. arm is located at FS 48.00.
- The aft baggage wall (approximate FS 108.00) or aft baggage wall (approximate FS 142.00) can be used as a convenient interior reference point for determining the location of baggage area fuselage stations.

Figure 6-5

INTERNAL CABIN DIMENSIONS

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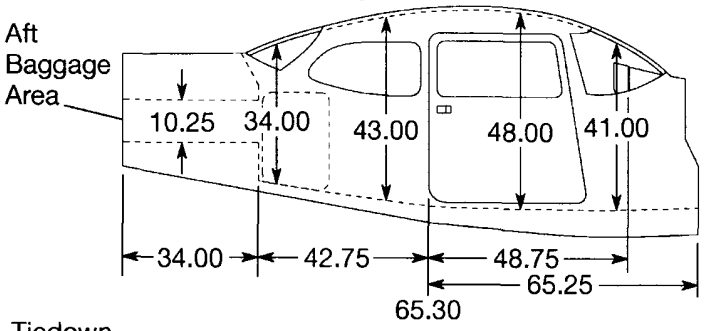
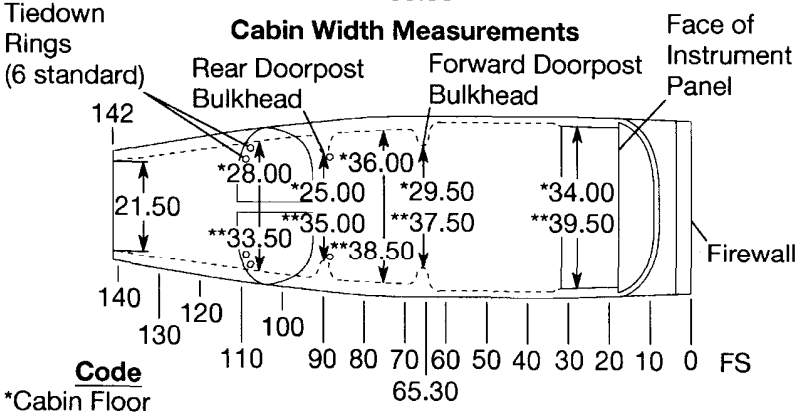
Cabin Height Measurements



Cabin Width Measurements



Code

*Cabin Floor

**Lower Window Line

Door Opening Dimensions

	Width (Top)	Width (Bottom	Height (Front)	Height (Rear)
Cabin Door	32.00	37.00	40.50	39.00
Baggage Door	15.25	15.25	22.00	21.00

0585T1023
0585T1004

NOTE

- Maximum allowable floor loading: 200 pounds/square foot.
- All dimensions shown are in inches.

Figure 6-6

CENTER-OF-GRAVITY MOMENT ENVELOPE

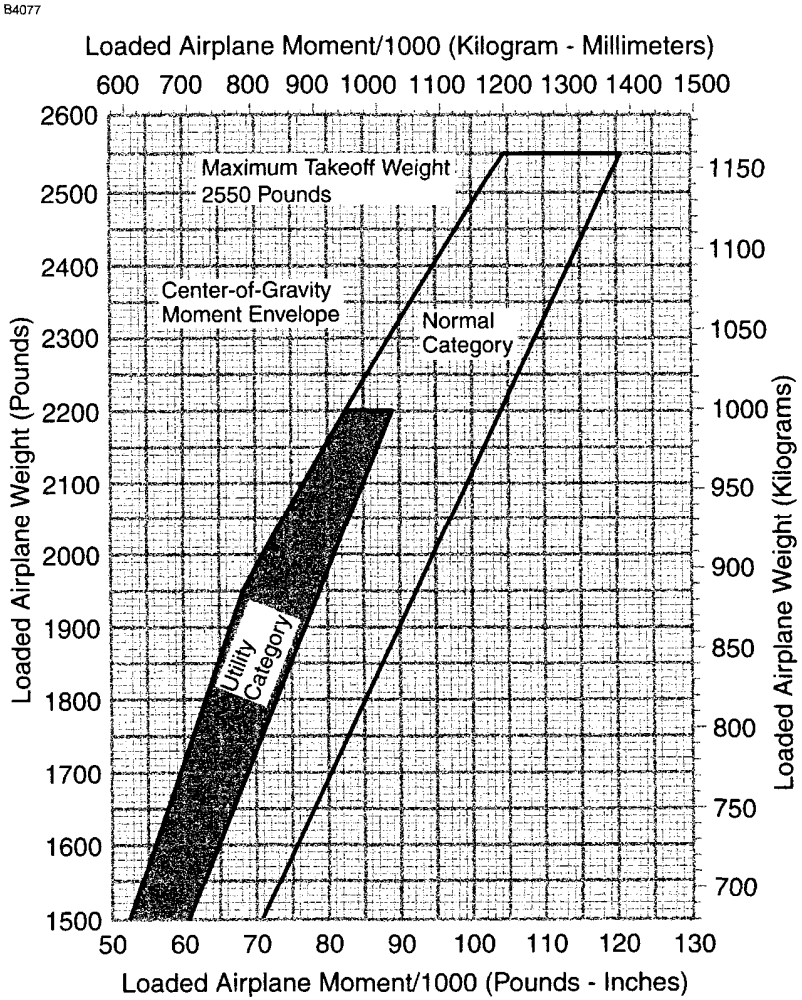


Figure 6-7

CENTER-OF-GRAVITY LIMITS

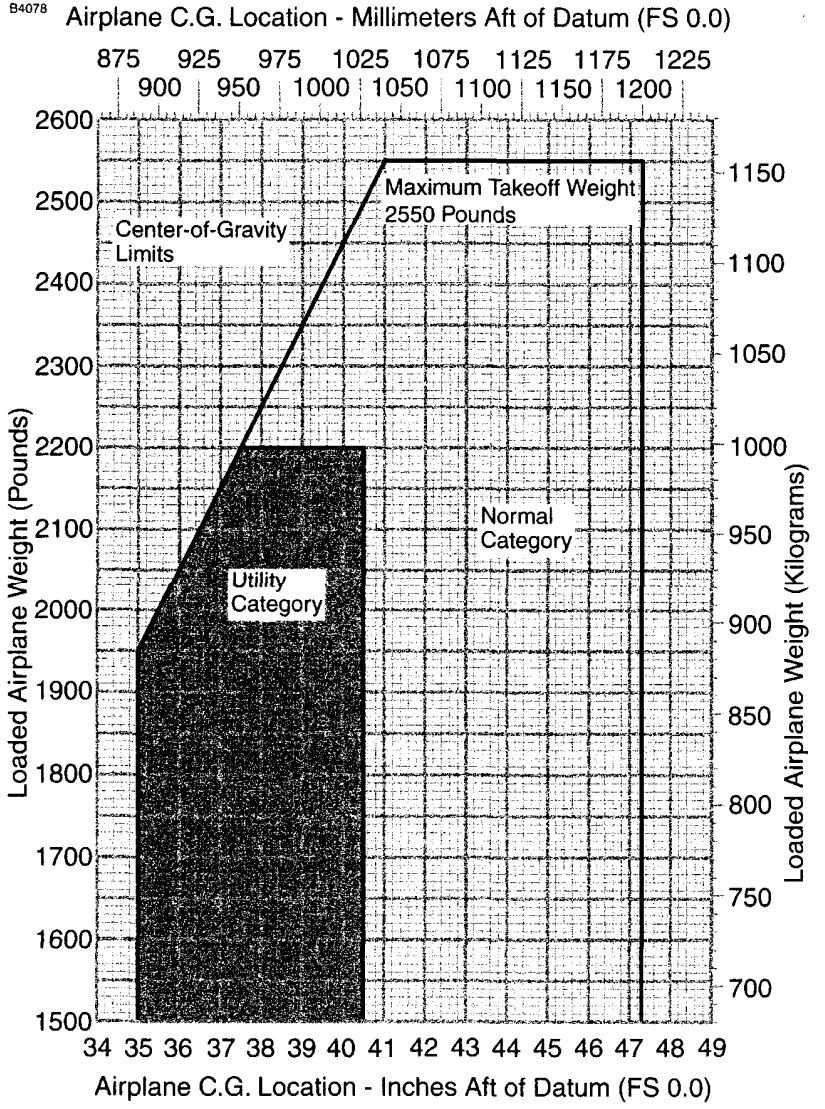


Figure 6-8

COMPREHENSIVE EQUIPMENT LIST

Figure 6-9 is a comprehensive list of all Cessna equipment which is available for the Model 172S airplane equipped with Garmin G1000 Integrated Cockpit System (Serials 172S9810 and On). This comprehensive equipment list provides the following information in column form:

In the **ITEM NO** column, each item is assigned a coded number. The first two digits of the code represent the identification of the item within Air Transport Association Specification 100 (11 for Paint and Placards; 24 for Electrical Power; 77 for Engine Indicating, etc.). These assignments also correspond to the Maintenance Manual chapter for the airplane. After the first two digits, items receive a unique sequence number (01, 02, 03, etc.). After the sequence number, a suffix letter is assigned to identify equipment as a required item, a standard item or an optional item.

Suffix letters are as follows:

R= Required items or equipment for FAA certification (14 CFR Part 23 or Part 91).
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.

In the **EQUIPMENT LIST DESCRIPTION** column, each item is assigned a descriptive name to help identify its function.

In the **REF DRAWING** column, a Cessna drawing number is provided which corresponds to the item.

NOTE

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

In the **WT LBS** and **ARM INS** columns, information is provided on the weight (in pounds) and arm (in inches) of the equipment item.

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