

**AA-5 SERIES  
MAINTENANCE MANUAL**

**CHAPTER 8**  
**LEVELING & WEIGHING**  
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AIRCRAFT PREPARATION FOR WEIGHING

1. General

This section contains the procedure for determining the basic empty weight and moment of the aircraft. Sample forms and the corresponding procedures for their use are provided to enable a rapid calculation of the weight and moment for various operations. A comprehensive list of all available equipment for the aircraft is also provided.

It should be remembered that specific information on weight, arm, moment, and installed equipment for this aircraft can only be found in the appropriate weight and balance records carried in the aircraft.

2. Preparation Procedures

Prepare the aircraft for leveling and weighing as follows:

- A. Inflate all tires to recommended operating pressure. (Refer to Chapter 12.)
- B. Drain all fuel from the tanks and fuel system. (Refer to Chapter 28.)
- C. Drain all oil from the oil system. (Refer to Chapter 12.)
- D. Move sliding seats to center of travel position.
- E. Raise flaps to fully retracted position.
- F. Place all controls in neutral position.
- G. Ensure that all objects not a part of the aircraft or its accessories are removed from the aircraft.
- H. Slide canopy to provide a six inch opening between canopy and windshield.

LEVELING

1. General

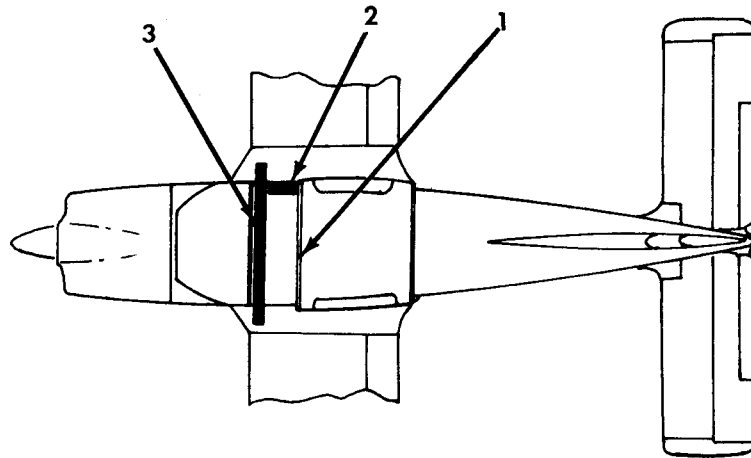
Normally, aircraft leveling is accomplished in conjunction with aircraft weighing. When this is the case, the aircraft should be mounted on the scales prior to leveling.

When leveling is done in conjunction with some maintenance procedure (fuel gage calibration, etc.), the aircraft should be parked on a level surface.

2. Leveling Procedure

Level the aircraft as follows:

- A. Place under each wheel (minimum capacity 1500 pounds for nose wheel and 1000 pounds capacity for main wheels), with a 1 inch thick wooden block between each wheel and the scale.
- B. Place carpenter's levels on canopy track as shown in Figure 1.
- C. Level aircraft both laterally and longitudinally by deflating one or two tires until the bubbles in the level center.



- (1) Open the canopy approximately six inches.
- (2) Level aircraft longitudinally by placing a short spirit level on the right canopy rail forward of the pilot's seat, and deflating nose tire or main gear tires to center the bubble.
- (3) Level the aircraft laterally by placing a four foot carpenter's level across the canopy rails at windshield and differentially deflating main gear tires to center the bubble.

Aircraft Leveling  
Figure 1

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**WEIGHING**

**1. General**

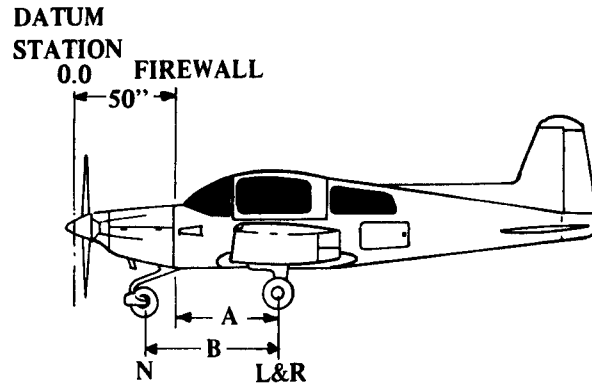
Aircraft weighing should be done in an area such as a hangar where wind or other disturbances do not cause inaccurate scale readings. The scales used should be properly calibrated and of sufficient capacity to support the aircraft.

**2. Weighing Procedure**

Weigh the aircraft as follows:

- A. Remove the levels, close and lock the canopy.
- B. With aircraft level and brakes released, record the weight shown on each scale as shown in Figure 1.
- C. Deduct tare (chocks, etc.), if any, from the scale readings and record the result in the weighing form.

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Scale Position	Scale Reading	Tare	Symbol	Net Weight
Left Wheel			L	
Right Wheel			R	
Nose Wheel			N	
Total of Net Weight			W	

Calculate Arm (in inches) as follows:

**NOTE**

- (50 + A) = Main Landing Gear Arm (in Inches)
- 50 - (B - A) = Nose Landing Gear Arm (in Inches)
- L = Weight of Left Main Landing Gear (in Pounds)
- R = Weight of Right Main Landing Gear (in Pounds)
- N = Weight of Nose Landing Gear (in Pounds)

$$\text{C.G. Arm} = \frac{[(50 + A)(L + R)] + [50 - (B - A)]N}{L + R + N}$$

Item	Weight	C.G. Arm	Moment/ 1000 Lbs. In.
Aircraft Net Weight (W)			
Oil, 8 Qt. at 1.875 Lb./Qt.	15.0	32.0	.48
Unusable Fuel 1.6 Gal. at 6 Lb./Gal.	9.6	94.8	.91
Equipment Changes			
Aircraft Basic Empty Weight			

Sample Aircraft Weighing  
Figure 1

MEASURING ARM

1. General

The following procedures must be performed carefully in order to obtain the accuracy required for proper center of gravity computation. When performing these measurements, ensure that the string is stretched tight enough to prevent deflection during measurement, and that the aircraft is level during the measurements.

2. Measuring Procedure

Measure the arm as follows:

A. Obtain measurement A (Section 8-2-1, Figure 1) as follows:

- (1) Stretch a string laterally across the aircraft from the axle center of one main landing gear to the axle center of the other.
- (2) Connect a plumb bob such that it hangs from the centerline of the engine firewall to the floor.
- (3) Using a tape, measure the distance along the centerline of the aircraft from the plumb bob to the string stretched between the main landing gear.
- (4) Record measurement A in the Weight Form (Section 8-2-1, Figure 1).

B. Obtain measurement B (Section 8-2-1, Figure 1) as follows:

- (1) Ensure that the nosewheel is set straight along the centerline of the aircraft.
- (2) Using a tape, measure from the center of the nose gear axle to the string stretched between the main landing gear wheels.
- (3) Record measurement B in the Weight Form (Section 8-2-1, Figure 1).

COMPUTING CENTER OF GRAVITY

1. General

The following computation is performed in the sample form shown in Section 8-2-1, Figure 1. This computation determines the aircraft basic empty weight moment.

2. Computation Procedures

Perform the computation as follows:

- A. Using the weights previously recorded, calculate the aircrafts net weight (W), per Section 8-2-1, Figure 1.
- B. Using the weights and measurements previously recorded, calculate the C.G. Arm according to the formula in Section 8-2-1, Figure 1.
- C. Enter the aircrafts net weight (W) and C.G. Arm obtained in Steps A and B in the Aircraft Basic Empty Weight Form at the bottom of Section 8-2-1, Figure 1.
- D. Obtain moment by multiplying weight times C.G. Arm and dividing by 1000. Enter moment in the appropriate column.
- E. Add the entries in the Weight column to obtain the AIRCRAFT BASIC EMPTY WEIGHT.
- F. Add the entries in the MOMENT/1000 Lbs. In. column to obtain the AIRCRAFT BASIC EMPTY WEIGHT MOMENT.