

**08**

**LEVELING AND  
WEIGHING**



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## LEVELING AND WEIGHING

### DESCRIPTION AND OPERATION

#### 1. GENERAL

This chapter covers the aircraft leveling operations, the weighing principles and the weight and center of gravity calculations.

##### A. Leveling - refer to 08-10-00

The aircraft shall be leveled during weighing operations, wing twist, wheel alignment and triangulation checks.

##### B. Weighing - refer to 08-20-00

The aircraft must be weighed and its C.G. calculated :

- after each modification, major repair or important change to internal equipment,
- whenever the aircraft is completely painted,
- at least every 5 years.

**NOTE** : The weights and lever arms which permit to calculate moments of standard and optional equipment are described in section 6 of the Pilot's Operating Handbook.

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## LEVELING

### MAINTENANCE PRACTICES

#### 1. SERVICING - LEVELING

##### A. Tools and consumable materials

- 1 ruler
- 2 levels

##### B. Leveling procedure with the jacks (Figure 201)

- 1) Jack up the aircraft - refer to 07-10-00.
- 2) Position a ruler (2) transversely across the door edges and place levels (1) and (3) on the ruler and on one door edge.
- 3) Adjust the jacks to set the levels in horizontal position.
- 4) Carry out the maintenance operations.
- 5) Lower the aircraft to ground and remove the jacks - refer to 07-10-00.

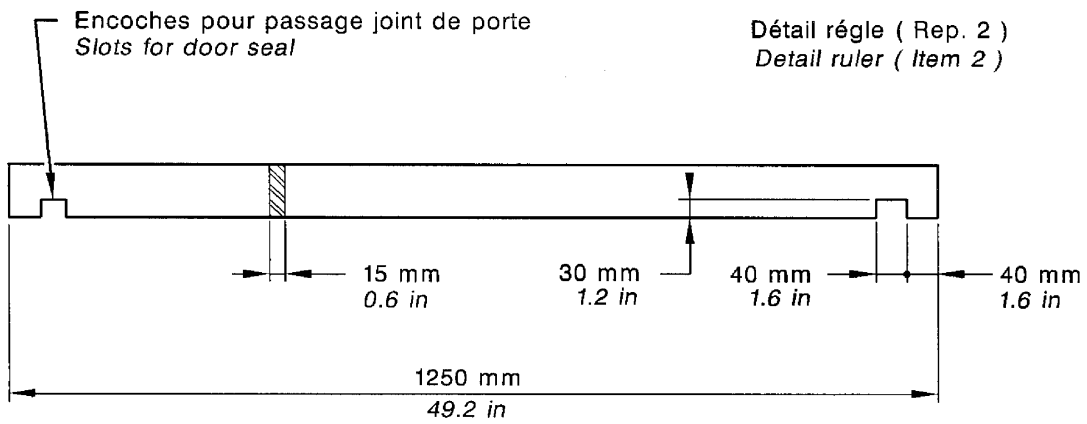
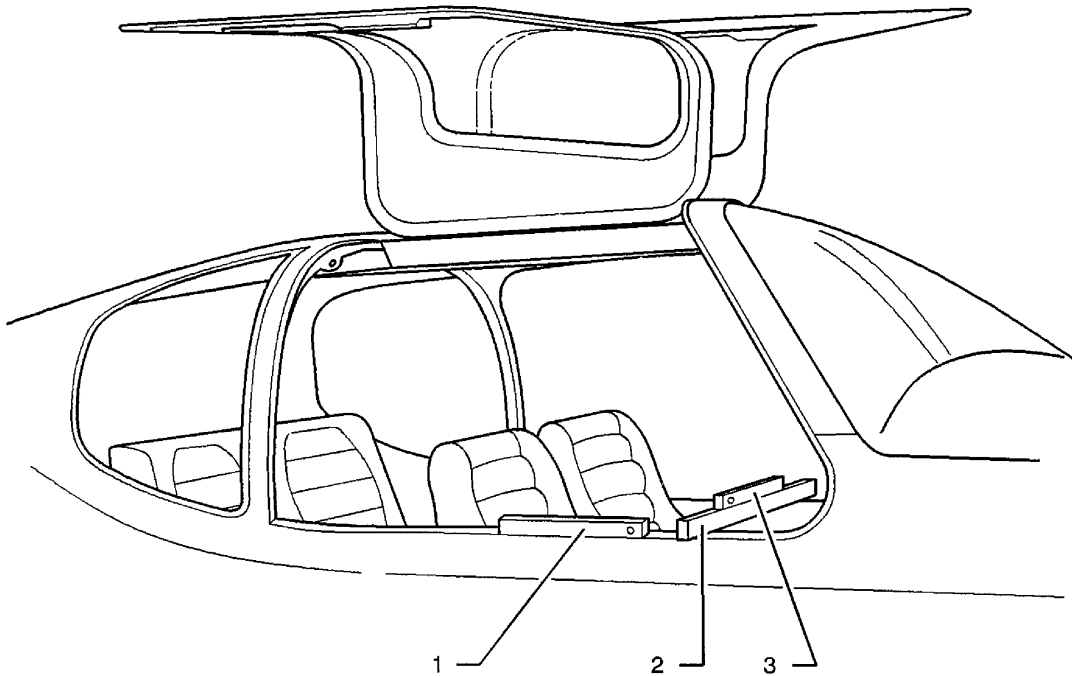
##### C. Leveling procedure without the jacks (Figure 201)

- 1) Install the wheel chocks or apply the parking brake.
- 2) Position a ruler (2) transversely across the door edges and place levels (1) and (3) on the ruler and on one door edge.
- 3) Deflate one (or two) tire(s) to level the aircraft laterally and longitudinally.
- 4) Carry out the maintenance operations.

**CAUTION : TO RESTORE THE AIRCRAFT AIRWORTHINESS, DO NOT FORGET TO REINFLATE THE TIRES TO NORMAL PRESSURE.**

- 5) Inflate the tires - refer to 12-14-01.
- 6) Make sure all the tools and materials are removed and the work area is clean and free from debris.

- 1 - Level
- 2 - Ruler
- 3 - Level



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Leveling the aircraft  
Figure 201

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## WEIGHING

### MAINTENANCE PRACTICES

#### 1. SERVICING - WEIGHING

##### A. Tools and consumable materials

- 3 scales
- 3 jacks (facultative)

##### B. Aircraft weighing procedure (Figure 201)

###### 1) Preliminary operations

- a) Remove any snow, ice or water on the aircraft.
- b) Weigh the aircraft in a closed hangar to avoid errors due to draughts.
- c) Drain the fuel tanks - refer to 12-11-02.
- d) Replenish the oil system - refer to 12-12-01.
- e) Retract the flaps.
- f) Set the flight controls to "neutral".
- g) Make sure the aircraft does not contain any items other than the accessories constituting the normal A / C onboard kit.
- h) Make a list of the equipment items remaining in the A / C during the weighing operation - refer to Section 6 of the Pilot's Operating handbook corresponding to the aircraft.
- i) Install the scales under the jacks if leveling is carried out with jacks.
- j) Position the aircraft on the scales if leveling is carried out without jacks.

###### 2) Leveling

Carry out aircraft leveling - refer to 08-10-00.

###### 3) Weighing

- a) Record the scales readings as indicated in the table below.
- b) Deduct the tares, if any.

	Read weight kg or lbs	Tare kg or lbs	Net weight kg or lbs
Front wheel or jack			P <sub>1</sub> =
L.H. wheel or jack			P <sub>2</sub> =
R.H. wheel or jack			P <sub>3</sub> =
Weighed weight P kg or lbs =			

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main landing gear

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4) Aircraft center of gravity (C.G.) calculation

- a) Calculate the weighed weight.
- b) Calculate the distance from the C.G. to the reference using the formula – see Figure 201 :

$$d = b - \frac{(c \times p1)}{P}$$

- c) Record the weight and lever arm values in the table below.
- d) Calculate the moment by multiplying the weight by the lever arm value and record the result in the corresponding box of the table below.
- e) Correct the weights and C.G. as necessary if equipment items were removed prior to weighing – refer to Section 6 of Pilot’s Operating Handbook.
- f) Add the weights in the weights column to obtain the empty weight.

**CAUTION : PAY SPECIAL ATTENTION TO NEGATIVE MOMENTS**

- g) Add the moments in the moments column to obtain the empty aircraft moment.
- h) Divide the moment by the weight to obtain the empty aircraft lever arm.

	Weight		Lever arm		Moment	
	kg	lbs	m	in.	m.kg	in.lbs
Weighed weight						
Non usable fuel : 6 litres 1.585 U.S. Gal. 1.32 Imp. Gal.	4.3	9.47	1.075	42.32	4.63	401.86
Empty A / C						

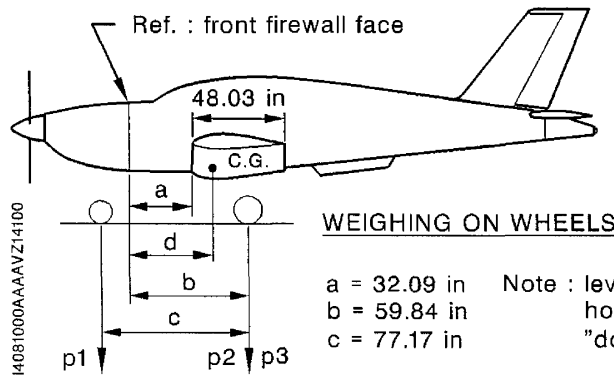
**C. Reconditioning**

- 1) In case of leveling with the jacks, lower the aircraft to ground and remove the jacks – refer to 07-10-00.
- 2) In case of leveling without the jacks, inflate the tires – refer to 12-14-01.
- 3) Remove the scales.
- 4) Replenish the fuel tanks – refer to 12-11-01.
- 5) Make sure all the tools and materials are removed and the work area is clean and free from debris.

**D. Weighing report (Figure 201)**

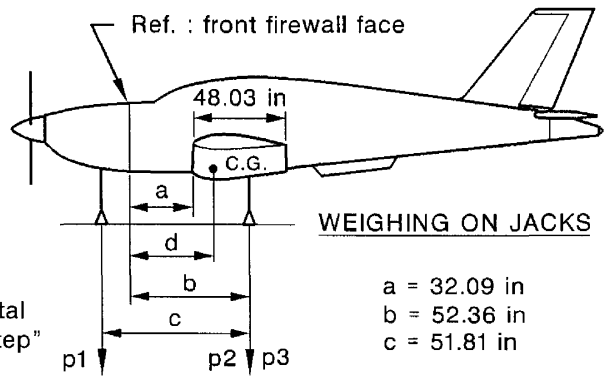
After each weighing, draft a weighing report which must be kept with the aircraft documents.

<b>WEIGHING REPORT</b>	<b>Aircraft, type</b> : TB	<b>Date</b> :
	<b>Registration</b> :	<b>Place</b> :
		<b>Signature</b> :



**WEIGHING ON WHEELS**

a = 32.09 in  
b = 59.84 in  
c = 77.17 in  
Note : leveling horizontal "door-step"



**WEIGHING ON JACKS**

a = 32.09 in  
b = 52.36 in  
c = 51.81 in

WEIGHING CARRIED OUT ON JACKING POINTS			
	Read weight (lbs)	Tare (lbs)	Net weight (lbs)
L.H. jacking point			p <sup>2</sup>
R.H. jacking point			p <sup>3</sup>
FWD jacking point			p <sup>1</sup>
Empty weight P (lbs) =			

DISTANCE FROM C.G. LOCATION TO REFERENCE (before corrections)

$$d(in.) = b - \frac{(c \times p1)}{P}$$

CORRECTIONS			
	Weight (lbs)	Lever arm (in.)	Moment (lbs.in)
Empty aircraft	P	d	
Non usable fuel			
Results	M	D	

**LEGEND**

Empty weight must include unusable fuel quantity and oil full load

C.G. LIMITS										LOADING EXAMPLE			
Weight (lbs)										Empty aircraft	Weight (lbs)	Lever arm (in.)	Moment (lbs.in)
										Pilot			
										Passengers			
										Luggage			
										Fuel			
										Total			
Distance from C.G. location to reference (in.)										Previous weighing	(Empty weight : Date : )	lbs )	

Weighing report  
Figure 201

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main landing gear

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main landing gear

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## WEIGHING

### MAINTENANCE PRACTICES

#### 1. SERVICING - WEIGHING

##### A. Tools and consumable materials

- 3 scales
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##### B. Aircraft weighing procedure (Figure 201)

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- a) Remove any snow, ice or water on aircraft.
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- d) Replenish the oil system - refer to 12-12-01.
- e) Retract the flaps.
- f) Set the flight controls to "neutral".
- g) Make sure the aircraft does not contain any items other than the accessories constituting the normal A / C onboard kit.
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- i) Install the scales under the jacks if leveling is carried out with jacks.
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R.H. wheel or jack			P <sub>3</sub> =
Weighed weight P kg or lbs =			

- 4) Aircraft center of gravity (C.G.) calculation
  - a) Calculate the weighed weight.
  - b) Calculate the distance from the C.G. to the reference using the formula - see Figure 201 :

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- c) Record the weight and lever arm values in the table below.
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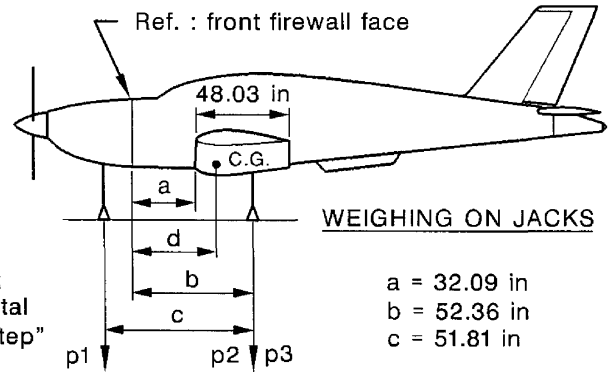
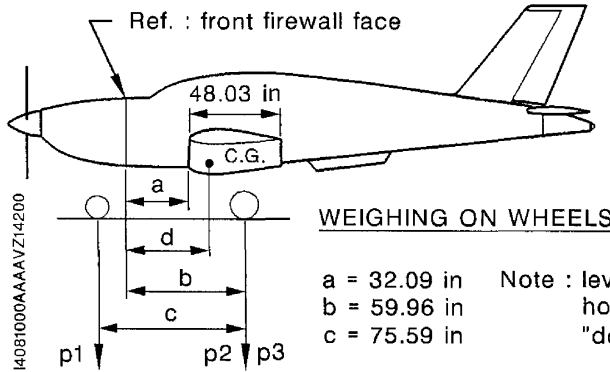
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Note : leveling horizontal "door-step"

WEIGHING CARRIED OUT ON JACKING POINTS			
	Read weight (lbs)	Tare (lbs)	Net weight (lbs)
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R.H. jacking point			p <sup>3</sup>
FWD jacking point			p <sup>1</sup>
Empty weight P (lbs) =			

DISTANCE FROM C.G. LOCATION TO REFERENCE (before corrections)

$$d(in.) = b - \frac{(c \times p1)}{P}$$

CORRECTIONS			
	Weight (lbs)	Lever arm (in.)	Moment (lbs.in)
Empty aircraft	p	d	
Non usable fuel			
Results	M	D	

**LEGEND**

Empty weight must include unusable fuel quantity and oil full load

C.G. LIMITS										LOADING EXAMPLE					
Weight										(lbs)	Distance from C.G. location to reference (in.)		Weight (lbs)	Lever arm (in.)	Moment (lbs.in)
											Empty aircraft				
											Pilot				
											Passengers				
											Luggage				
											Fuel				
									Total						
									Previous weighing		(Empty weight : lbs)				
											(Date : )				

Weighing report  
Figure 201

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