CHAPTER

08

LEVELING AND WEIGHING

Subject	Chapter Section Subject	Page
LEVELING - MAINTENANCE PRACTICES	8-10-00	
Leveling	8-10-00	201
WEIGHING - MAINTENANCE PRACTICES	8-20-00	
Weighing	8-20-00	*201*
Determining Aircraft CG in Percent of Mean Aerodynamic Chord (MAC)	8-20-00	203

Learjet

Chapter Section Subject	Page	Date
* 8-TITLE		
* 8-Record of Temp. Revisions	1	May 1/89
* 8-List of Eff. Pgs.	1	May 1/89
* 8-Contents	1	May 1/89
* 8-10-00	201	May 1/89
* 8-10-00	202	May 1/89
* 8-20-00	201	May 1/89
* 8-20-00	202	May 1/89
* 8-20-00	203	May 1/89
* 8-20-00	204	May 1/89
* 8-20-00	205	May 1/89

Chapter Section Subject	Page	Date

Insert Latest Revised Pages; Destroy Superseded or Deleted Pages.

* Asterisk indicates pages revised, added or deleted by current revision. The portion of the text affected by the current revision is indicated by a vertical line in the outer margin of the page.

REV. NO.	DATE INSERTED	DATE REMOVED	PAGE NUMBER	REV. NO.	DATE INSERTED	DATE REMOVED	PAGE NUMBER
8-1	Dec 13/78	May 11/79 Rev #14	8-20-00 Page 7				

1. LEVELING

A. Tools and Equipment

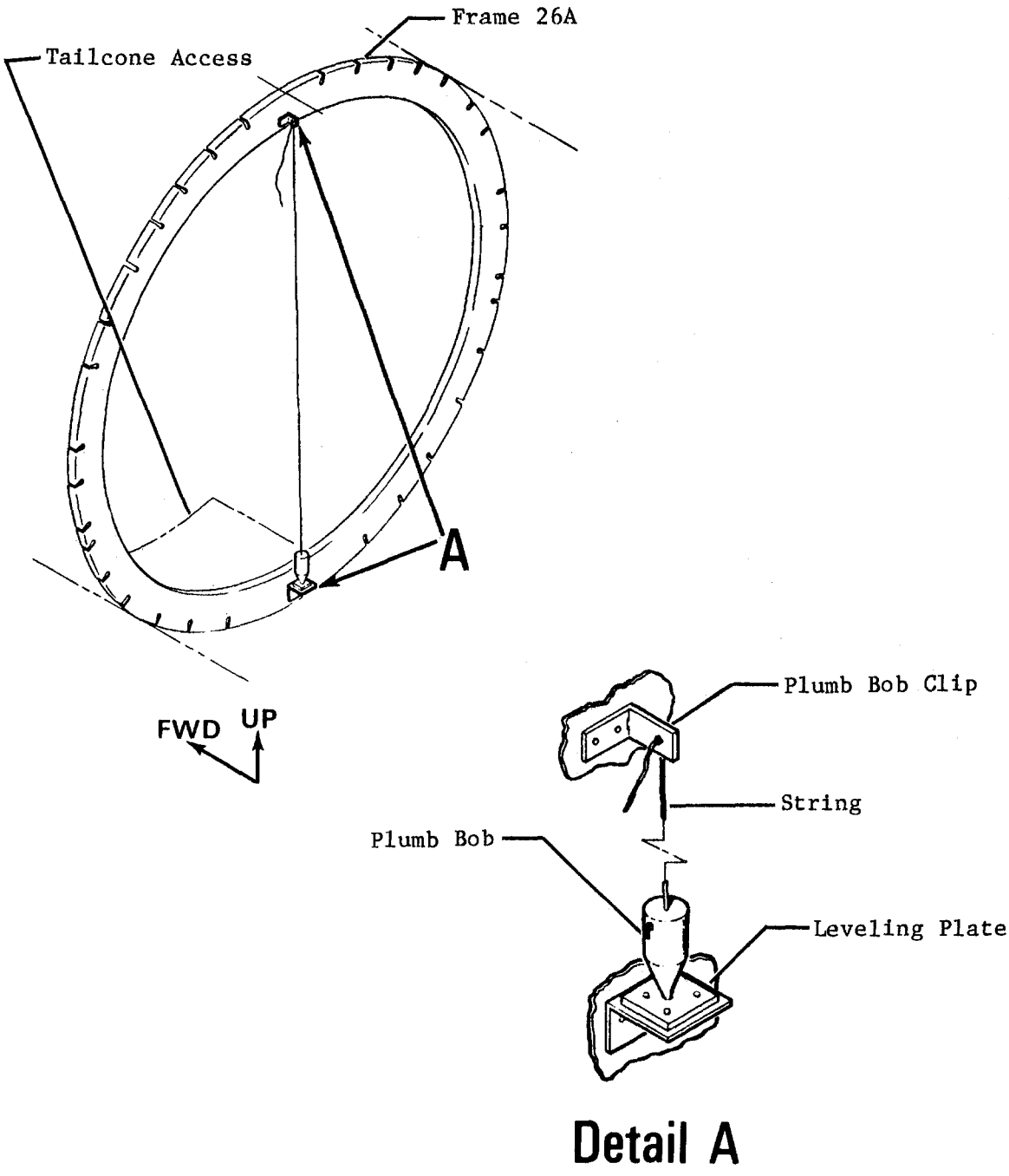
NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Plumb bob		Commercially Available	Level aircraft.
String		Commercially Available	Level aircraft.

B. Level the aircraft (See figure 201.)

NOTE: Aircraft leveling is accomplished by using a plumb bob clip and leveling plate located in the upper and lower tailcone area immediately aft of frame 26A (station 492.55) at BL 0.

(1) Lower tailcone access door and disconnect aircraft batteries.
(2) Attach plumb bob and string to plumb bob clip located on the aft side of frame 26A. Suspend plumb bob from the inboard side of the clip so that the plumb bob point extends into the hole of the leveling plate.
(3) Place aircraft on jacks. (Refer to Chapter 7.)
(4) Adjust jacks until plumb bob point extends into leveling plate hole without touching sides of hole. Aircraft is now considered to be level.
(5) Remove plumb bob and secure tailcone access door.



Aircraft Leveling
Figure 201

1. WEIGHING

A. Tools and Equipment

NOTE: Equivalent substitutes may be used in lieu of the following:

NAME	PART NUMBER	MANUFACTURER	USE
Electronic Scales	C-55800-3-10 or equivalent	Revere Corp. of America Wallingford, CT	Weighing Aircraft

B. Weigh the Aircraft (Electronic Scales) (See figure 201.)

(1) Refer to electronic kit operating manual for specific weighing instructions.

NOTE:
- All weighing operations must be conducted in a closed hangar and care taken that no air currents pass over the aircraft during weighing, or inaccurate readings will result.
- The basic weight of the aircraft includes trapped and unusable fuel. If the fuel system is drained (dry aircraft), the trapped and unusable fuel weight and moment must be entered under Table II in the Aircraft Weighing Record. Refer to Approved Airplane Flight Manual, Weight and Balance Section, for unusable fuel weights.

(2) Record the weight on each scale cell in the proper space marked Scale Reading in the Aircraft Weighing Record-Electronic Scale.
(3) With all weight removed from the cells and scale switches adjusted to zero, a small plus or minus weight reading may occur on the scale. If there is a plus reading, divide it by two and enter it as a negative number under Tare on the Aircraft Weighing Record. If there is a minus reading, divide it by two and enter it as a positive number under Tare on the Aircraft Weighing Record. If the tare is greater than ±5 pounds (±2.27 kg) for any one cell, repeat the weighing procedure.
(4) Add or subtract the tare of each cell to or from its respective scale reading. Enter the result under Net Weight in the Aircraft Weighing Record.
(5) Subtotal the left and right jack net weights.
(6) Multiply the net weight on the left and right jacks combined by their arm (414.85) to obtain moment. Record under Moment in the Aircraft Weighing Record.
(7) Multiply the net weight on the nose jack by its arm (170.53) to obtain moment. Record under Moment in the Aircraft Weighing Record.
(8) Add the two moments.
(9) Add the net weights.
(10) Divide total moment by total weight to obtain CG of the aircraft as weighed.
(11) Total Table I weights and subtract from aircraft total weight.
(12) Total Table I moments and subtract from aircraft total moment.
(13) Total Table II weights and add to aircraft total weight. This is the aircraft basic weight.
(14) Total Table II moments and add to aircraft total moment. This is the aircraft basic moment.
(15) Divide basic moment by basic weight. This is the CG of the aircraft.

C. Weigh the Aircraft (Platform Scales) (See figure 202.)

NOTE: All weighing operations must be conducted in a closed hangar and care taken that no air currents pass over the aircraft during weighing.

(1) Remove all loose equipment from aircraft which is not a part of the aircraft empty weight.
(2) If necessary, wash aircraft to remove any accumulation of mud, dirt, or grease.
(3) Defuel aircraft. (Refer to Chapter 12.)

NOTE: The basic weight of the aircraft includes trapped and unusable fuel. If the fuel system has been drained (dry aircraft), the trapped and unusable fuel weight and moment must be entered under Table II in the Aircraft Weighing Record. (Refer to Approved Airplane Flight Manual, Weight and Balance Section, for unusable fuel weight.)

(4) Service the following to normal operating capacity: engine oil tanks, hydraulic accumulator, refrigeration system, oxygen bottle, and emergency air bottle. (Refer to Chapter 12 for servicing procedures.)
(5) Inventory aircraft for items which are not part of the empty weight but will have to be weighed with the aircraft. Enter each item, its weight, and its arm under Table I in the Aircraft Weighing Record (figure 202).

NOTE: If the platform scales are not equipped with built-in wheel chocks, the wheel chocks used after the aircraft is placed on the scales will need to be weighed and entered per step (5).

(6) Inventory aircraft for items which are fixed equipment but will not be weighed with the aircraft; for example, a seat which has been removed for repair. Enter each item, its weight, and its arm under Table II for the Aircraft Weighing Record (figure 202).
(7) Inflate tires to proper pressure. (Refer to Chapter 12.)
(8) Deflate landing gear struts. (Refer to Chapter 12.)
(9) Place aircraft on jacks (Refer to Chapter 7.)
(10) Position platform scales under wheels and lower aircraft onto scales. Install wheel chocks and remove jacks and jack pads from aircraft.
(11) Lower tailcone access door and attach a plumb bob and string to the plumb bob clip located on the aft side of frame 26A. (Refer to 8-10-00.)
(12) Inflate main gear struts until aircraft is level (the plumb bob point extends into the leveling plate hole without touching sides of hole).
(13) Remove plumb bob and secure tailcone access door.
(14) Close passenger/crew door.
(15) Drain wing and fuselage sumps.
(16) The nose wheel axle centerline fuselage station is 153.88 which is entered as the nose jack reaction point under "Arm" in the Aircraft Weighing Record.
(17) Measure perpendicular distance from the centerline of the nose wheel axle to a line joining the centerlines of the main wheels. Add this measurement to the nose wheel reaction point. Enter this figure (main wheel reaction point) under "Subtotal Arm" in the Aircraft Weighing Record.
(18) Read the weight from each platform scale and enter in the "Scale Reading" column of the Aircraft Weighing Record.

(19) Install jack pads and jacks.
(20) Jack aircraft until it is completely off of the3 scales and remove whell chocks from the scales. If there is a plus reading on the scales, divide it by two and enter it as a negative number under Tare on the Aircraft Weighing Record. If there is a negative reading on the scales, enter it as a positive number under Tare on the Aircraft Weighing Record. If the tare is greater than ±5 pounds (±2.27 kg) for any one scale, the scales need to be recalibrated and certified and the weighing procedure repeated.
(21) Remove the platform scales and lower the aircraft to the ground.
(22) Inflate nose gear shock strut and main gear shock struts. (Refer to Chapter 12.)
(23) Add or subtract the tare of each scale to or from its respective scale reading; enter the results under Net Weight in the Aircraft Weighing Record.
(24) Subtotal the left and right wheel scale net weights.
(25) Multiply the net weight of the left and right scales combined by their arm (obtained in step (17) to obtain moment. Record under "Subtotal Moment" in the Aircraft Weighing Record.
(26) Multiply the net weight on the nose wheel scale by its arm (153.88) to obtain moment. Record under Moment in the Aircraft Weighing Record.
(27) Add the two moments.
(28) Add the net weights.
(29) Divide total moment by total weight to obtain CG of the aircraft as weighed.
(30) Total Table I weights and subtract from aircraft total weight.
(31) Total Table I moments and subtract from aircraft total moment.
(32) Total Table II weights and add to aircraft total weight. This is the aircraft basic weight.
(33) Total Table II moments and add to aircraft total moment. This is the basic moment.
(34) Divide basic moment by basic weight. This is the CG of the aircraft.

2. DETERMINING AIRCRAFT CG IN PERCENT OF MEAN AERODYNAMIC CHORD (MAC)

A. From the following formula, it can be determined whether the aircraft CG is within the prescribed limits as defined by the Weight and Balance Data Manual. The formula states:

$$\text{CG in \% of MAC} = \left[\frac{\text{Fuselage Station - Leading Edge of MAC}}{\text{MAC}}\right] \times 100$$

Where:
(1) Fuselage station is the CG or arrn as defined in the Weight and Balance Data Manual located in the Approved Airplane Flight Manual.
(2)
Leading edge of MAC is 362.17.
(3)
MAC is 82.75.

Therefore:

$$\text{CG in \% of MAC} = \left[\frac{\text{Fuselage Station - 362.17}}{82.75}\right] \times 100$$

Learjet

Date Weighed	Model 35/36/35A/36A	Serial No.
Place Weighed	Weighing Inspector:	

Reaction	Scale Reading	Tare	Net Weight	Arm	Moment
Left Jack					
Right Jack					
Sub Total				414.85	
Nose Jack				170.53	
Total (As Weighed)					
Total Items Table I			—		
Total Items Table II			+		
Basic Airplane					

TABLE I

Items weighed but not part of basic airplane	Weight	Arm	Moment
jack pads			
TOTAL			

TABLE II

Basic items not in when weighed	Weight	Arm	Moment
unusable fuel			
TOTAL			

Aircraft Weighing Record - Electronic Scales
Figure 201

Date Weighed	Model 35/36/35A/36A	Serial No.
Place Weighed	Weighing Inspector:	

Reaction	Scale Reading	Tare	Net Weight	Arm	Moment
Left Jack					
Right Jack					
Sub Total					
Nose Jack				153.88	
Total (As Weighed)					
Total Items Table I			−		
Total Items Table II			+		
Basic Airplane					

TABLE I

Items weighed but not part of basic airplane	Weight	Arm	Moment
jack pads			
TOTAL			

TABLE II

Basic items not in when weighed	Weight	Arm	Moment
unusable fuel			
TOTAL			

Aircraft Weighing Record - Platform Scales
Figure 202