

SECTION 6

WEIGHT AND BALANCE

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6.1 - GENERAL

This section contains the procedure for determining the basic empty weight and the balance corresponding to the TBM 850 airplane. Procedures for calculating the weight and the balance for various flight operations are also provided. A list of equipment available for this airplane is referenced at the end of this section.

It should be noted that the list of specific optional equipment installed on your airplane as delivered from the factory can be found in the records carried in the airplane.

IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AND THE WEIGHT AND BALANCE LIMITS ARE ADHERED TO.

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6.2 - AIRPLANE WEIGHING PROCEDURES

Refer to Maintenance Manual for the procedures to use.

NOTE :

Weighing carried out at the factory takes into account all equipment installed on the airplane. The list of this equipment and the total weight is noted in the Individual Inspection Record.

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6.3 - BAGGAGE LOADING

There are two baggage compartments :

- one located in the rear of the pressurized cabin provides a maximum baggage capacity between 187 lbs (85 kg) and 220 lbs (100 kg),
- the other one located in the rear fuselage section, non pressurized, between the rear pressure bulkhead at frame C17 and the frame C18 provides a maximum baggage capacity between 55 lbs (25 kg) and 77 lbs (35 kg).

Baggage compartment maximum loading, as well as load distribution among the baggage compartments must be determined using the baggage loading graph (Figures 6.3.1 and 6.3.1A).

Stowing straps are provided for securing parcels and baggage on pressurized baggage compartment floor.

A partition net separating the cabin from the baggage compartment is attached to frame C14.

WARNING

IT IS THE PILOT'S RESPONSIBILITY TO CHECK THAT ALL THE PARCELS AND BAGGAGES ARE PROPERLY SECURED IN THE CABIN

TRANSPORT OF DANGEROUS PRODUCT IS NORMALLY PROHIBITED, HOWEVER IF TRANSPORT OF SUCH PRODUCT IS NECESSARY, IT WILL BE PERFORMED IN COMPLIANCE WITH REGULATIONS CONCERNING TRANSPORT OF DANGEROUS PRODUCT AND ANY OTHER APPLICABLE REGULATION

Weight and balance graph should be checked to ensure the airplane is within the allowable limits.

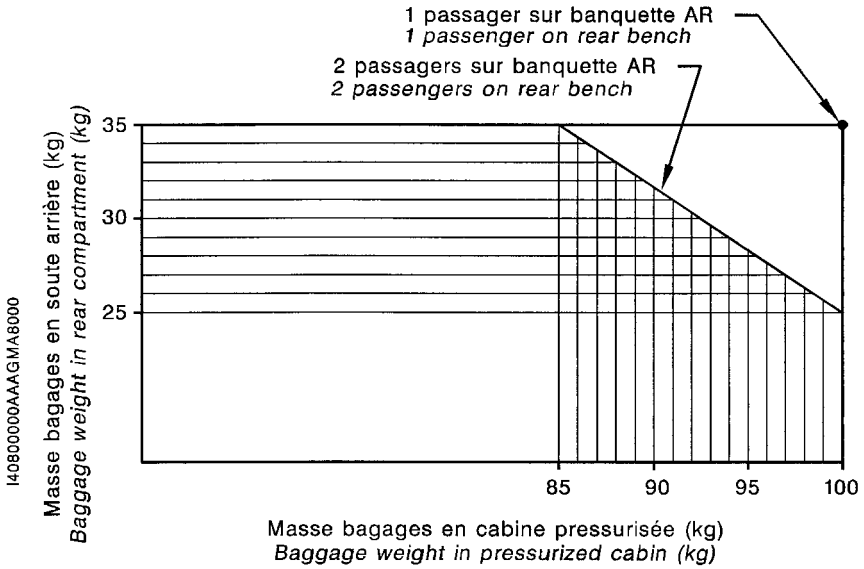


Figure 6.3.1 - BAGGAGE LOADING GRAPH (in kg)

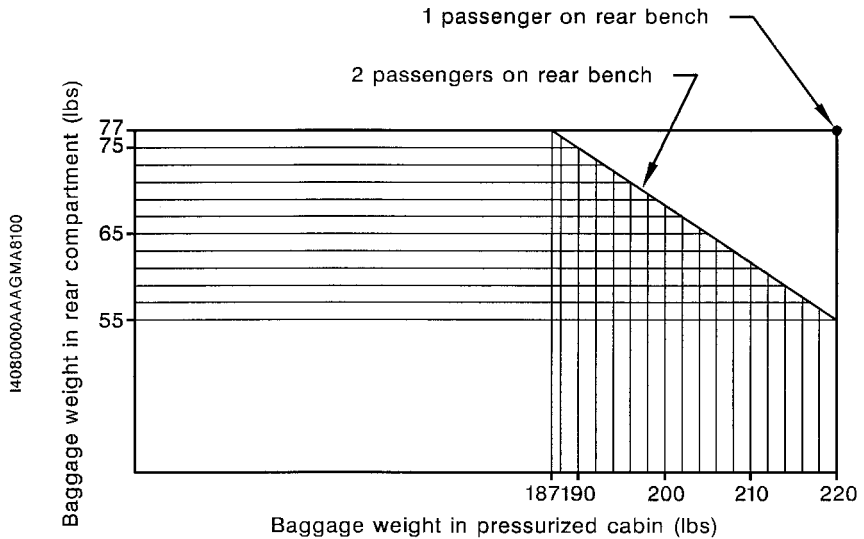


Figure 6.3.1A - BAGGAGE LOADING GRAPH (in lbs)

6.4 - DETERMINING WEIGHT AND BALANCE

GENERAL

This paragraph is intended to provide the pilot with a simple and rapid means of determining weight and balance of his airplane.

IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AND THE WEIGHT AND BALANCE LIMITS ARE ADHERED TO.

Empty weight to be considered is the weight noted on last weighing form. To this empty weight corresponds a basic balance, expressed in percent of mean aerodynamic chord. Empty weight and the corresponding balance allow to calculate the airplane basic index.

If airplane empty weight has varied since last weighing form, refer to paragraph "DETERMINING EMPTY AIRPLANE CHARACTERISTICS" to determine new empty weight and the corresponding balance (for instance : optional equipment installation).

UTILIZATION OF WEIGHT AND BALANCE GRAPH (Figures 6.4.1, 6.4.1A and 6.4.2, 6.4.2A)

EXAMPLES :

	SAMPLE 1 Fig. 6.4.1	SAMPLE 2 Fig. 6.4.1A
1 - Airplane basic characteristics :		
W = Empty weight	: 2160 kg	4762 lbs
CG = Balance (m.a.c. %)	: 16 %	16 %
2 - Foreseen loading :		
1 Pilot and 1 front Passenger	: 154 kg	340 lbs
2 Intermediate Passengers	: 113 kg	250 lbs
2 Rear Passengers	: 113 kg	250 lbs
Cargo in pressurized cabin	: 60 kg	132 lbs
Fuel	: 500 kg	1102 lbs

3 - Utilization of weight and balance graph :

- Record airplane basic characteristics in ①.
- Compute basic index with the formula described in ② and record the result in ③.
- Record foreseen loading in ④ and compute total weight of the loaded airplane.

NOTE :

Intermediate calculation of total weight without fuel allows, taking into account the "Maximum Weight" limit, computing rapidly fuel quantity liable to be loaded.

A conversion scale (lb / us gal) allows quick computation from fuel pounds to us gallons.

- Note computed index ③ on upper index scale and proceed as follows :
 - a) Vertically mark a line downwards up to interception of oblique lines of first heading "Front seats".
 - b) Then continue the line horizontally following direction given by arrow according to indicated value of loading (340 lbs or 154 kg in example) **(the weight indicated in the arrow gives pitch value between two oblique lines)**.
 - c) Then continue the line vertically downwards up to interception of oblique lines of second heading and work in the same way as before (procedure described in b).
 - d) Proceed in the same way for remaining headings.
- Draw then a vertical line ⑤ corresponding to final index (loaded airplane) up to interception of horizontal line representing airplane total weight ⑥.
- Read corresponding balance (29.6 % in examples) by checking that obtained point is inside the weight and balance envelope.
Check also that the total zero fuel weight does not exceed the max. zero fuel weight of 6001 lbs (2722 kg). If not, reconsider airplane loading.
- Record these data on your navigation log.

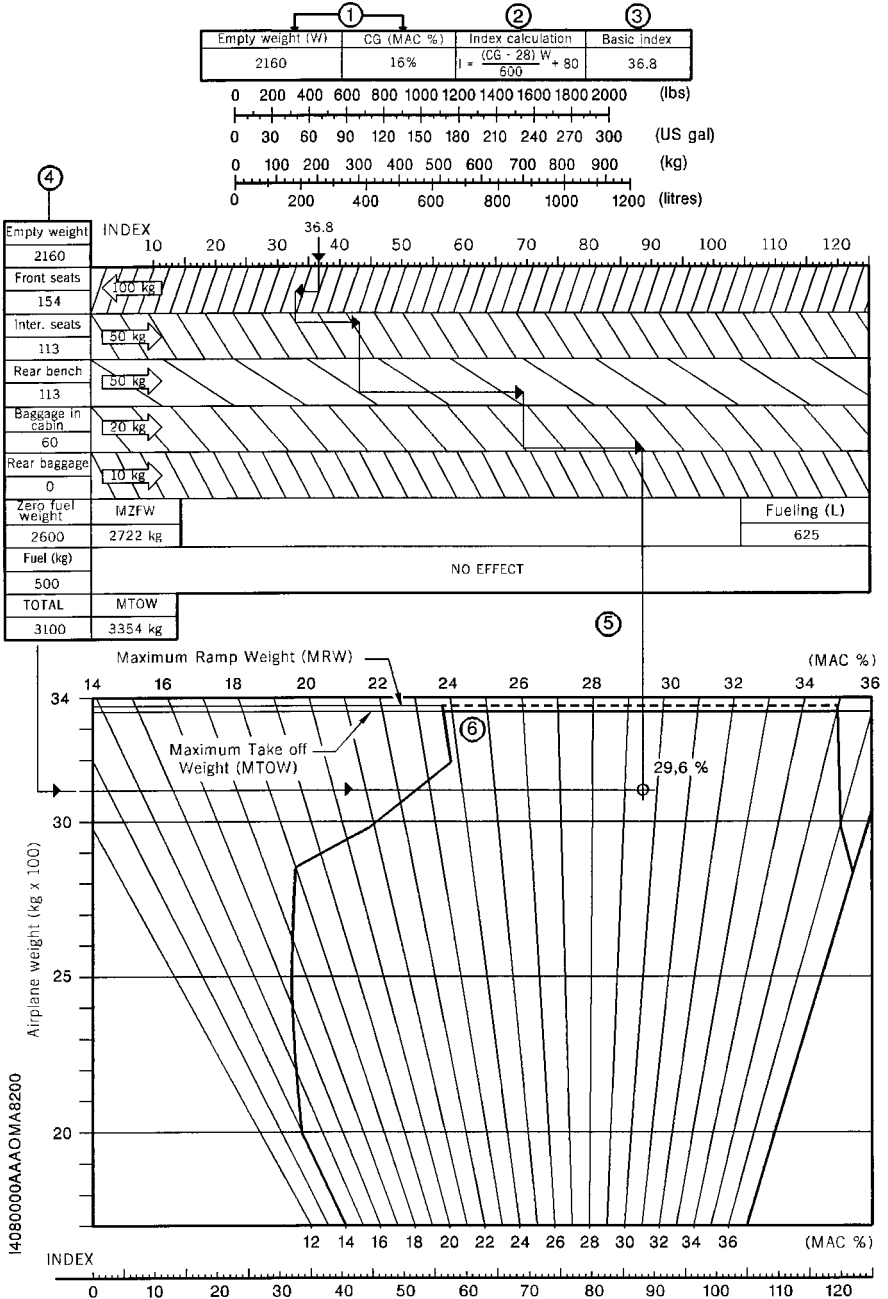


Figure 6.4.1 - LOADING SAMPLE (in Kg and Litres)

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TBM

PILOT'S OPERATING HANDBOOK 850

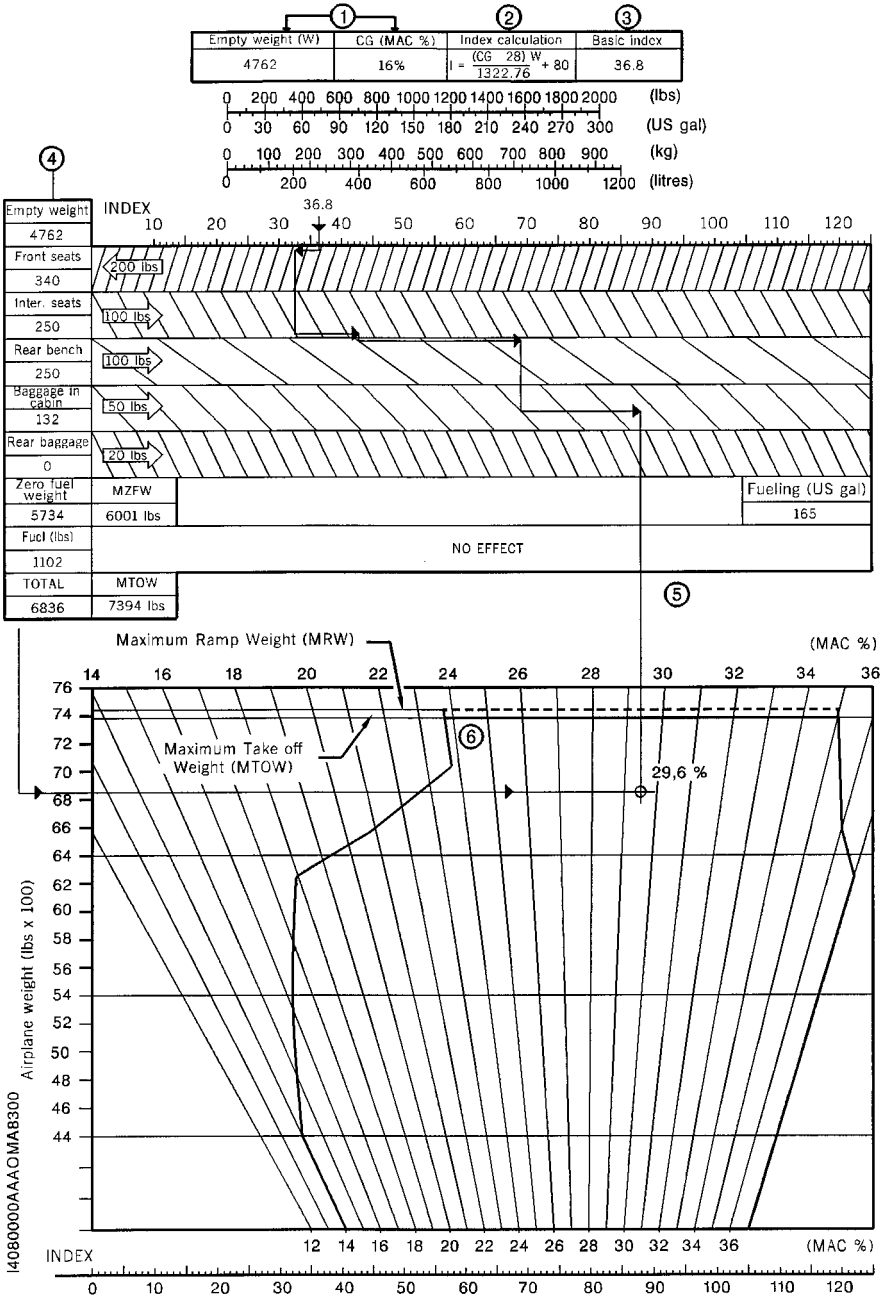


Figure 6.4.1A - LOADING SAMPLE (in lbs and us gal)

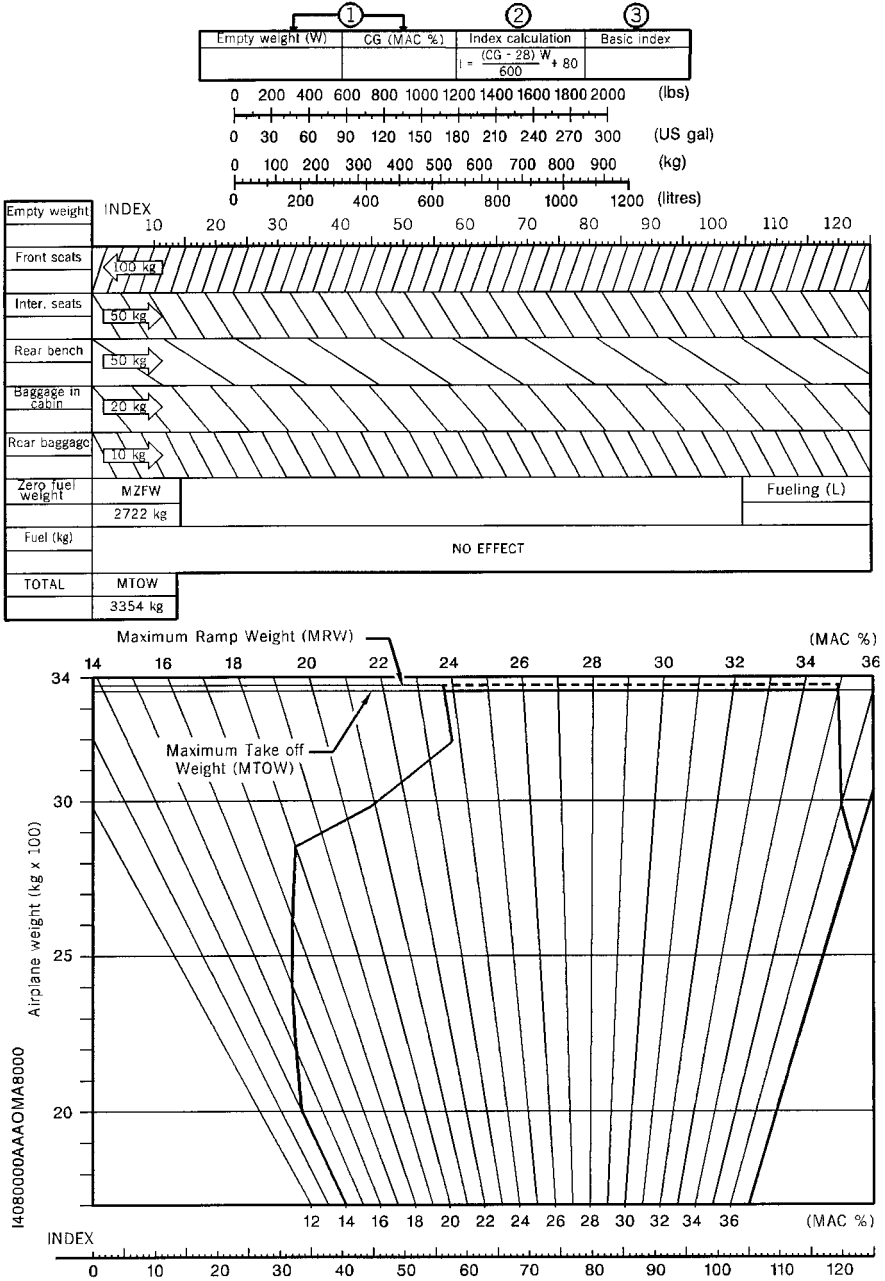
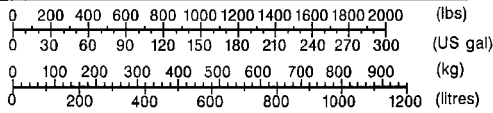


Figure 6.4.2 - WEIGHT AND BALANCE GRAPH (in Kg and Litres)

①	②	③
Empty weight (W)	CG (MAC %)	Index calculation
		$I = \frac{(CG - 28) W}{1322.76} + 80$
		Basic index



Empty weight	INDEX		
	10	20	30
Front seats	200 lbs		
Inter. seats	100 lbs		
Rear bench	100 lbs		
Baggage in cabin	50 lbs		
Rear baggage	20 lbs		
Zero fuel weight	MZFW		Fueling (US gal)
	6001 lbs		
Fuel (lbs)		NO EFFECT	
TOTAL	MTOW		
	7394 lbs		

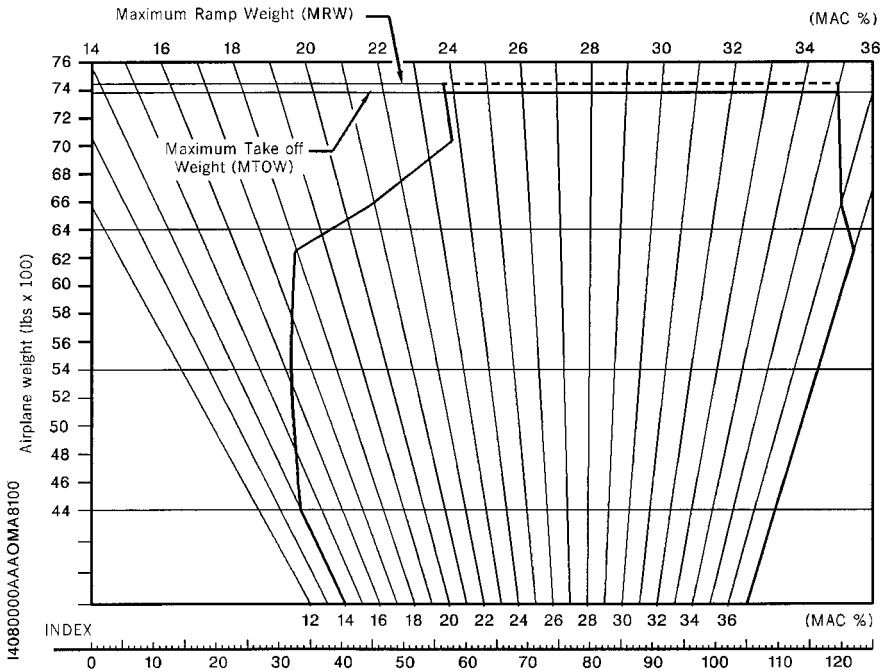


Figure 6.4.2A - WEIGHT AND BALANCE GRAPH (in lbs and us gal)

DETERMINING EMPTY AIRPLANE CHARACTERISTICS

Empty airplane characteristics (weight and balance) may vary with regard to those indicated on weighing form according to installed optional equipment and installed seats.

List of equipment (refer to paragraph 6.5) contains the standard and optional equipment, as well as their characteristics (weight, arm).

Use the chart below to compute new empty weight and corresponding balance if necessary.

DATE	EQUIPMENT OR MODIFICATION DESCRIPTION	(+) (-)	WEIGHT MODIFICATION			BASIC EMPTY WEIGHT		
			Weight lb	Arm in.	Moment lb.in/1000	Weight W	Arm "d _o "	Moment
	According to delivery							

Figure 6.4.3 - SAMPLE WEIGHT AND BALANCE RECORD

$$CG \text{ m.a.c.}\% = \frac{(d_o - 172.93)}{59.45} \times 100$$

Use the above formula to express arm "d_o" in % of mean aerodynamic chord.

NOTE :

Arm expressed in inches with regard to reference.

Front seats : 178.5 in. (4.534 m)

Intermediate seats : 222.7 in. (5.656 m)

Rear bench (2 seats) : 267.1 in. (6.785 m)

Baggage compartment in pressurized cabin : 303.0 in. (7.695 m)

Aft baggage compartment : 329.4 in. (8.366 m)

Fuel : 189.8 in. (4.820 m)

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6.5 - LIST OF EQUIPMENT

The list of equipment is available in SOCATA Report reference NAV No. 34/90-RJ-App 1, located at the end of this POH.

A separate list of equipment of items installed at the factory in your specific airplane is provided in your airplane file.

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