CA-A/AMBP-VT01

AIRBUS

C-295

AIR VEHICLE MASS AND BALANCE

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LIST OF CHAPTERS

CHAPTER

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LIST OF REVISIONS

CHANGE	EDITION DATE	INSERTED DATE	BY
000	15/10/14		AIRBUS MILITARY
001	15/11/17		AIRBUS MILITARY
002	15/10/18		AIRBUS MILITARY
003	01/12/19		AIRBUS MILITARY
004	01/10/20		AIRBUS MILITARY

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HIGHLIGHTS

DMC	STATUS	REASON FOR CHANGE
CA-A-08-00-00-00A-005A-A	Changed	Improvement
CA-A-08-00-00-00A-006A-A	Changed	Improvement
CA-A-08-40-12-00A-000A-A	Changed	Improvement
CA-A-08-40-40-00O-000A-A	Changed	Improvement

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LIST OF EFFECTIVE PAGES

DMC	PAGES	DATE
CA-A-00-00-00-00A-010A-A	1 to 1	15/10/2018
CA-A-08-00-00-00A-005A-A	1 to 2	01/10/2020
CA-A-08-00-00-00A-006A-A	1 to 5	01/10/2020
CA-A-08-00-00-00Q-010A-A	1 to 1	15/10/2014
CA-A-08-00-00-00A-017A-A	1 to 3	01/12/2019
CA-A-08-00-00-00A-018A-A	1 to 3	15/11/2017
CA-A-08-00-10-00O-000A-A	1 to 8	15/10/2018

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TABLE OF CONTENTS

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VERSIONS
List

1 GENERAL

The Table(s) that follow give the list of cross-reference among the Aircraft Serial Numbers, the AIRBUS DEFENCE & SPACE Serial Number and the C-295 aircraft Version and the C-295 Model.

AIRCRAFT SERIAL NUMBER	AIRBUS DEFENCE & SPACE SERIAL NUMBER	C-295 VERSION / MODEL
123	C123	VT01-01 / C-295M
128	C128	VT01-02 / C-295M
132	C132	VT01-03 / C-295M

Table 1 Versions List

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WEIGHT AND BALANCE MANUAL
Abbreviations

1 ABBREVIATIONS LIST

A/C	Aircraft
AECMA	European Association of Aerospace Industries
CG	Center of Gravity
Cos	Cosine
RH	Right Hand
FAR	Federal Aviation Regulations
FR	Frame
LEMAC	Leading Edge Mean Aerodynamic Chord
LH	Left Hand
MAC	Mean Aerodynamic Chord
MEW	Manufacturer"s Empty Weight
MFW	Maximum Design Flight Weight
MLW	Maximum Design Landing Weight
MTOW	Maximum Design Take-Off Weight
MTW	Maximum Design Taxi Weight
MZFW	Maximum Design Zero Fuel Weight
No.	Number
OEW	Operational Empty Weight
OI	Operational Items
OLW	Operational Landing Weight

OTOW	Operational Take-Off Weight
PAX	Passenger
P/L	Payload
SBEW	Standard Basic Empty Weight
Sen	Sine
SI	Standard Items
SIV	Standard Item Variation
STA	Station
Tag, Tg	Tangent
RT	Temporary Revision

WEIGHT AND BALANCE
Definitions

1 GENERAL

This data module gives general and specific definitions applicable to the Weight and Balance Manual to avoid misunderstanding.

2 GENERAL DEFINITIONS

2.1 REFERENCE DATUM

The reference datum is an imaginary plane, perpendicular to the aircraft longitudinal axis, situated at 1,587 m, forward of the aircraft nose, from which all horizontal distances are measured for balance purposes (Figure 1).

2.2 H-ARM

H-arm is the horizontal distance in meters from the reference datum to the center of gravity (CG) of the item considered.

2.3 MOMENT

The moment is the weight (in kg) of an item multiplied by its H-arm (in m).

2.4 AVERAGE ARM

The average arm is the distance between the reference datum line and the center of gravity of all the items considered (Figure 1). It is expressed by the formula:
- Average Arm (m) = Total Moment (kg.m) / Total weight (kg)

The total moment is the sum of the individual moments under consideration.

2.5 MEAN AERODYNAMIC CHORD (MAC)

The mean aerodynamic chord (MAC) is the chord of a section of an imaginary airfoil, which would have a force vector throughout the flight range identical to that of the actual wing. An airfoil section is a cross section of a wing from leading to trailing edges. A chord is usually defines as a straight line connecting the leading and trailing edges of the cross section of each different airfoil section.

The length of the MAC is 2,561 m (100,83 in).

The leading edge of the MAC (LEMAC) measured aft of the reference datum is LEMAC = 11,115 m (Figure 2).

3 SPECIFIC DEFINITIONS

3.1 MANUFACTURE'S EMPTY WEIGHT, MEW

The MEW is the weight of the structure, power plant, furnishing, systems, and other items of equipment that are an integral part of a particular airplane configuration. (It is essentially a "dry" weight, including only those fluids contained in closed systems).

3.2 STANDARD ITEMS, SI

Standard items are equipment and fluids not an integral part of a particular aircraft and not a variation for the same type of aircraft. These items may included, but are not limited to, the following:
– Unusable fuel and other unusable fluids.

– Engine oil
– Toilet fluid and chemical
– Fire extinguishers, pyrotechnics, emergency oxygen equipment
– Structure in galley, buffet, and bar
– Supplementary electronic equipment

3.3 STANDARD BASIC EMPTY WEIGHT, SBEW

SBEW is the Manufacturer's Empty Weight (MEW) plus the standard items(SI).
• SBEW = MEW + SI

3.4 STANDARD ITEM VARIATION, SIV

SIV are those items which the operator chooses to add to, omit from, or change in standard items (SI) to suit the operator's own convenience.

3.5 BASIC EMPTY WEIGHT, BEW

The BEW is the empty weight for a specific configuration of the aircraft version. It includes the empty weight plus the systems and interior furnishings for the said configuration.
• BEW = SBEW + SIV

This weight includes fluids contained in closed systems, the unusable fuel and other unusable fluids, engine oil, toilet fluid and chemical, fire extinguishers, pyrotechnics, emergency oxygen equipment and structure in galley, buffet and bar, etc. The basic empty weight will therefore vary with the changes of fixed equipment.

3.6 MAXIMUM DESIGN LANDING WEIGHT, MLW

The MLW is the maximum weight for landing as limited by aircraft strength and airworthiness requirements.

3.7 MAXIMUM DESIGN TAKE-OFF WEIGHT, MTOW

The MTOW is the maximum weight for take off as limited by aircraft strength and airworthiness requirements. This is the maximum weight at the start of the take-off run.

3.8 MAXIMUM DESIGN ZERO FUEL WEIGHT, MZFW

The MZFW is the maximum weight of an aircraft less the weight of all usable fuel, in particular sections of the aircraft limited by strength and airworthiness requirements. This is a weight at which the subsequent addition of fuel (as limited by the MTOW) will not exceed the aircraft design strength.

3.9 MAXIMUM DESIGN TAXI WEIGHT, MTW

The MTW is the maximum weight for ground manoeuvre as limited by aircraft strength and airworthiness requirements. It includes weight of an runup fuel.

3.10 MAXIMUM DESIGN FLIGHT WEIGHT, MFW

The MFW is the maximum weight for flight as limited by aircraft strength and airworthiness requirements. Flaps-up condition is implied unless otherwise stated.

3.11 MAXIMUM PAYLOAD

Is the maximum design zero fuel weight (MZFW) minus operational empty weight (OEW).

3.12 OPERATIONAL EMPTY WEIGHT, OEW

The OEW is the basic empty weight (BEW) plus the "Operational Items (O.I.)".
- OEW = BEW + OI

The operational items are those items of personnel, equipment and supplies that are necessary for a particular operation. These items may vary for a particular aircraft configuration according to the operators allowances for the service intended. These items include:
– Crew and baggage.
– Manuals and navigational equipment.
– Removable service equipment for cabin, galley and bar.
– Food and beverage including liquor.
– Usable fluids other than those in useful load.
– Life rafts, life vests and emergency transmitters.
– Aircraft cargo handling system and cargo container.

3.13 OPERATIONAL LANDING WEIGHT, OLW

The OLW of an aircraft is the maximum authorized weight for landing. It is subject to airport, operational and related restrictions. It must not exceed the MLW.

3.14 OPERATIONAL TAKE-OFF WEIGHT, OTOW

The OTOW of an aircraft is the maximum weight authorized for the take-off condition. It is subject to airport, operational and related restrictions. It is the weight at start of the take-off run and must not exceed the MTOW.

3.15 PAYLOAD (P/L)

P/L is the weight of passengers, passenger baggage and/or cargo. It consists of revenue and non revenue load.

3.16 TARE

The tare is the weight of items such as: Parking blocks, chocks, jacks, etc. necessary for weighing and which are not included in the weight of the aircraft

3.17 TRAPPED FUEL

The trapped fuel is the fuel remaining when aircraft is defueled by normal means using the procedures and attitudes specified for draining the tanks.

3.18 UNUSABLE FUEL

The unusable fuel is the amount of fuel remaining in the tanks after all usable fuel is used.

3.19 USABLE FUEL

The usable fuel is the fuel available for aircraft propulsion.

3.20 USEFUL LOAD

The useful load is the difference between the OTOW and the OEW. It includes P/L and usable fluids not included as operational items.

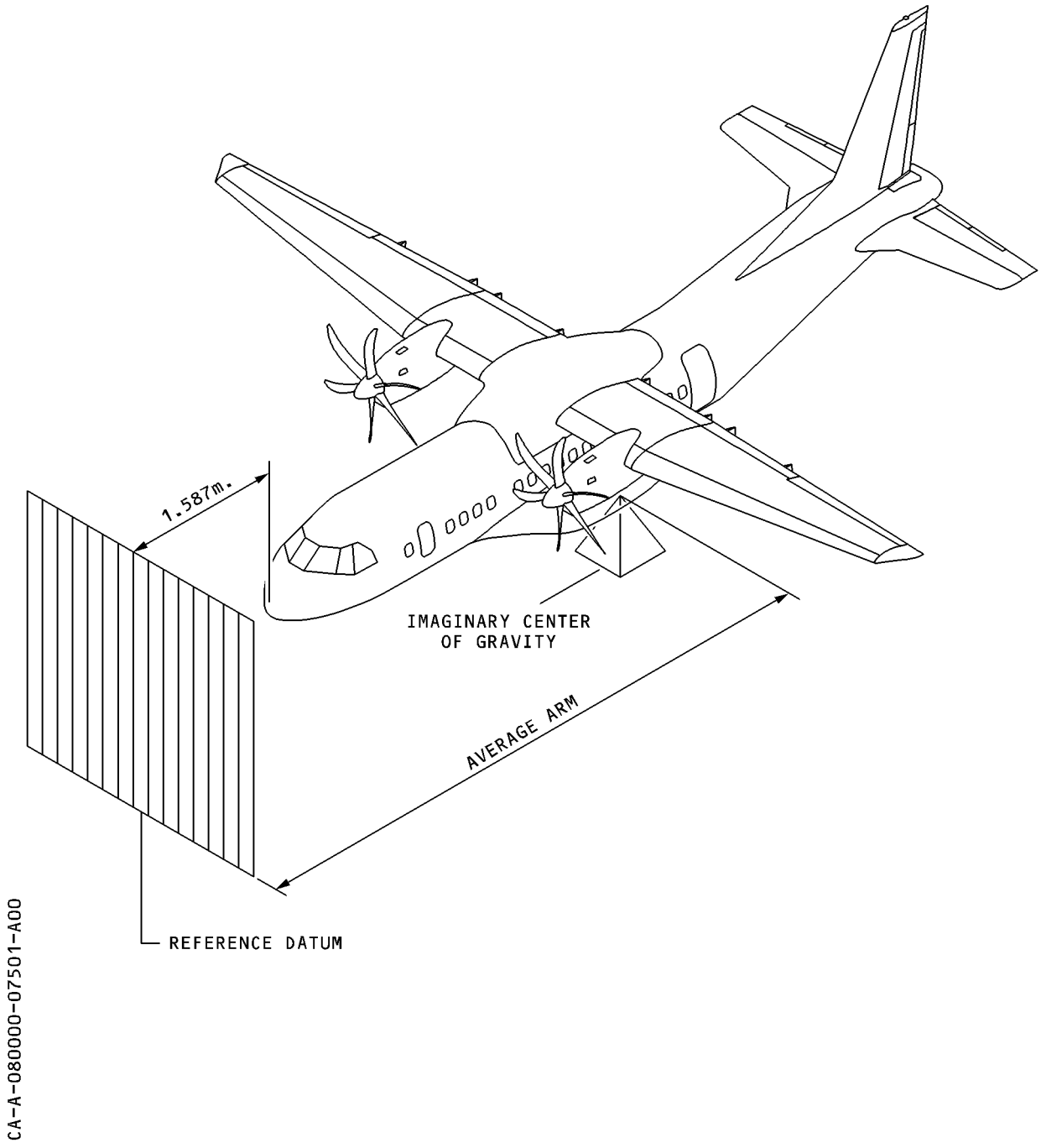

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Figure 1 Reference Datum

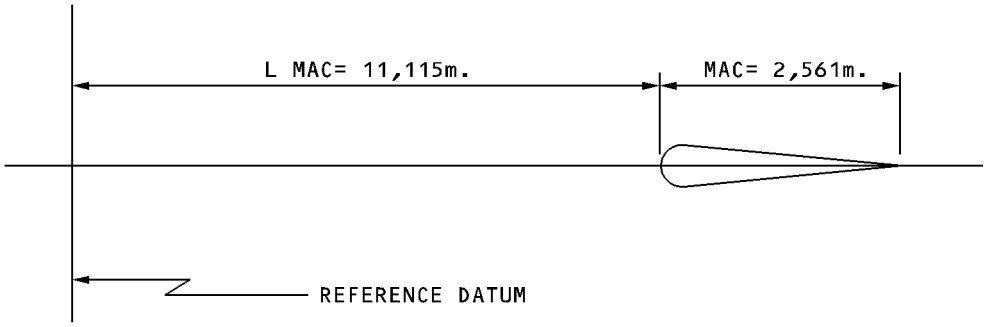

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Figure 2 Mean Aerodynamic Chord (MAC)

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LEVELING AND WEIGHING
General data

1 GENERAL DATA

This manual has these sections:
- General Description of the C295 aircraft (Refer to CA-A-00-10-00-00A-040A-A)
- Main physical geometry (Refer to CA-A-06-10-00-00A-040A-A)
- Structural stations (Refer to CA-A-06-20-00-00A-040A-A)
- Weighing Records (Refer to CA-A-08-00-10-00O-000A-A)
- Leveling (Refer to CA-A-08-20-00-00A-040A-A)
- Weighing (Refer to CA-A-08-30-00-00Q-000A-A)
- Mass and center of gravity (Refer to CA-A-08-40-00-00O-000A-A)

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WEIGHT AND BALANCE
Units of measurement and conversion factors

1 UNITS OF MEASUREMENT

Weight	Kilogram (kg)
Length	meter (m)
Moment (product of weight and length)	Kilogram-meter (kg.m)
Velocity	Kilometer per hour (km/h)
Capacity	liters (l)
Volume	cubic meter (m^3)
Density	kilogram per liters (kg/l)
Area	square meter (m^2)
Pressure	bar

2 CONVERSION FACTORS

2.1 WEIGHT

Multiply	By	To get
kilograms (kg)	2,2046	pounds (lb)
pounds (lb)	0,4536	kilograms (kg)

2.2 LENGTH

Multiply	By	To get
meters	39,3701	inches (in)
meters	3,2808	feet (ft)
inches (in)	0,0254	meters (m)
feet (ft)	0,3048	meters (m)

2.3 CAPACITY/QUANTITY

Multiply	By	To get
liters	0,2642	US gallons (US gal)
US gallons (US gal)	3,7850	liters (l)

2.4 AREA

Multiply	By	To get
square meters (m^2)	10,760000	square feet (ft^2)
square meters (m^2)	1550,000000	square inches (in^2)
square feet (ft^2)	0,092940	square meters (m^2)
square inches (in^2)	0,000645	square meters (m^2)

2.5 VOLUME

Multiply	By	To get
cubic meters (m^3)	35,313	cubic feet (ft^3)
cubic feet (ft^3)	0,0283	cubic meters (m^3)

2.6 DENSITY

Multiply	By	To get
kilograms per liters (kg/l)	8,3444	pounds per US gallon (lb/US gal)
pounds per US gallon (lb/US gal)	0,1198	kilograms per liters (kg/l)

2.7 VELOCITY

Multiply	By	To get
kilometers per hour (km/h)	0,5396	knots (kt)
kilometers per hour (km/h)	0,6214	miles per hour (mph)
knots (kt)	1,8532	kilometers per hour (km/h)
miles per hour (mph)	1,6093	kilometers per hour (km/h)

2.8 PRESSURE

Multiply	By	To get
bars	14,5000	pounds per square inches (lb/in^2)
pounds per square inches (lb/in^2)	0,0690	bars

3 INDEX UNITS

3.1 INDEX ARM REFERENCE DATUM PLANE

Is an imaginary plane, perpendicular to the aircraft longitudinal axis, located at 11.755 m (462.80 in.) from Reference Datum (Fuselage station STA 11755).

This plane is used as a reference for Index Arms and Index Units.

3.2 INDEX ARM (I.A.)

Is the horizontal distance, measured forward (-) and aft (+) of the Index Arm Reference Datum Plane, to the center of gravity of the element considered.

The LEMAC Index Arm is –640 mm (-25.18 in.).

$$I.A. = B(in.) - 462.80(in.)$$

3.3 INDEX UNITS (I.U.)

Are moments (in. x lb.), using the index Arm Reference Datum Plane as a reference, divided by a constant (400).

These moments are negative when Index Arms are measured forward of this plane, and positive when Index Arms are measured aft.

$$I.U. = \frac{W(lb) \times (B(in.) - 462.80(in.))}{400}$$

$$I.U. = \frac{W(lb) \times I.A.}{400}$$

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WEIGHT AND BALANCE MANUAL
Introduction

1 GENERAL

This manual is provided in accordance with AECMA 1000D Specification, version 1.8 (chapter 4.3.5).

2 CONTENTS

The Weight and Balance Manual (WBM) gives the weight and balance procedures recommended by the manufacturer for the C-295.

This manual gives the necessary information for an operator to load and operate a special configuration of the C-295 aircraft within the design weight and balance limits shown in:
– The DT-5-C-01-5003, “Airplane Flight Manual”
– The DT-5-C-01-5014, “Airplane Weight and Balance Control and Loading Data”

The data in these documents has priority to those on this manual if discrepancies are caused.

3 USE OF THE MANUAL

3.1 CHAPTERS DISTRIBUTION

The data modules used are of the Chapter 08, Leveling and Weighting, in accordance with AECMA 1000D (Chapter 2.4.1).

3.2 CHAPTER BREAKDOWN

The third position of the Standard Numbering System (SNS) shows the section:
– 08 LEVELING AND WEIGHING
  • 08-0 GENERAL
  • 08-1 MASS AND BALANCE
  • 08-2 LEVELING
  • 08-3 WEIGHING
  • 08-4 MASS AND CENTER OF GRAVITY

3.3 LIST OF EFFECTIVE PAGES

At the beginning of the Manual you can find the "List of Effective Pages" (LEP). This list gives all the data modules of this manual, together with their latest revision dates. The date shown in this list is the same that the date shown in each data module. The list of effective pages is revised with each regular revision of the manual.

3.4 TABLE OF CONTENTS

You can use the table of contents to locate a section or required information quickly and accurately. The table of contents (TOC) is behind the LEP. If necessary, it is reissued when affected by a revision.

3.5 EFFECTIVITY

The Weight and Balance Manual is a customized manual. All data that the operator finds in this manual is applicable to his version

Table 1 lists the manufacturers serial numbers (MSN), models, aircraft registrations and operators for which this manual is applicable. Chapter 2 of this manual contains specific information related to one aircraft only and the effectivity is identified by the applicable aircraft registration identification without punctuation or spacing.

Refer to CA-A-00-00-00-00A-010A-A , to get the cross-reference of versions, EADS-CASA serial number and serial number of the aircraft.

3.6 REGULAR REVISIONS

The manual is kept up to date by a regular revision service. Each scheduled revision includes a "Highlights" section, which is identified by the revision number. The highlights provide a brief summary of each change as well as instructions for removal of amended data modules and insertion of new and revised data modules in the manual.

3.7 TEMPORARY REVISION

The information required to be included in the manual between scheduled revisions is issued through a "Temporary Revision" (TR) service. Normally, information contained in a TR is incorporated into the manual at the next scheduled revision, thereby becoming a permanent part of the manual. The instructions issued with the scheduled revision will include removal of the TR.

Removal of a TR from a manual shall be carried out only when specific instructions are given in the revision Transmittal Sheet which accompanies a scheduled revision or when superseded by a new TR.

3.8 RECORD OF TEMPORARY REVISION

A record of all Temporary Revisions, which have been issued, is located at the front of the manual and provides information regarding the TR number, its location in the manual, its date of issue and where applicable, the date and number of the scheduled revision or new TR which instructed its removal. The Record of Temporary Revisions is updated and reissued at a scheduled revision, when appropriate. The manual user is required to keep the list up to date between reissues.

3.9 LIST OF EFFECTIVE TEMPORARY REVISIONS

A List of Effective Temporary Revisions, also located at the front of the manual, is provided as a ready means of informing the manual user of the TRs which are in force after the latest scheduled revision. The List of Effective Temporary Revisions is updated and reissued at a scheduled revision, when appropriate. The manual used is required to keep the list up to date between reissues.

3.10 REVISION SYMBOLS

Additions, deletions and revisions to existing text or illustrations are identified by a vertical line (revision symbol) in the LH margin adjacent to the amended text or illustration.

Revision symbols, introduced for previous revisions to a data module, will be removed on subsequent revisions to that data module.

4 RECOMMENDATIONS

This manual has been developed by the Publications Department of the Integrated Customer Services from the C-295 Technical Specifications.

If more data is necessary and for other questions, refer to:

•AIRBUS
- Integrated Customer Services
- Technical Services
- Technical Publications Department
- Factoría de San Pablo

- Avenida del Aeropuerto s/n
- 41020 Sevilla (Spain)
- Tel. +34 954 59 35 99
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WEIGHT AND BALANCE
Reports

1 WEIGHT AND BALANCE FORMS

1.1 BASIC WEIGHT CHECKLIST - FORM A

The Basic Weight Checklist (Table 1) is a part of the aircraft weighing report and is included with the aircraft delivery document.

The list contains quantity, weight, arm and moment of all standard operational items as required by the operator and which are additional to the Manufacturer Empty Weight (MEW) items. By cross referring to the Basic Weight Checklist any subsequent addition of deletion of any of these items can be identified and recorded in the Form C - BASIC WEIGHT AND BALANCE RECORD (Figure 2).

An inventory should be made periodically, but must also be made in the following cases:
– On delivery of the aircraft to the operator
– When the aircraft is delivered to a new operator
– When the aircraft is reweighed
– When the aircraft has undergone major repairs or overhaul
– When the aircraft has undergone a configuration change
– When the flight crew report a nose or tail heavy attitude during a flight operation.

1.2 AIRCRAFT WEIGHING RECORD - FORM B

The Form B (Figure 1) is used to record all weighing data and to enable the operator to calculate the aircraft basic weight, average arm and CG.

The procedure, in conjunction with weighing is as follows:

1.2.1 Fill in first column with the scale readings and subtract tare value to obtain net weight.

NOTE

If tare is negative, add the tare to the scale reading.

If tare is positive, subtract tare from the scale reading to obtain net weight.

1.2.2 Determine the A and B values.

1.2.3 Multiply the net weight at the nose weighing point and the net weight at the rear weighing points by the arms A and B, respectively, to obtain the moments.

1.2.4 Divide the total moment by the total net weight to obtain the average arm C.

1.2.5 Enter the result on sheet 2 of the form under "TOTAL" heading.

1.2.6 Subtract from the total, the weight and moment of the oil and the total weight and moment of column 1, then add the total weight and moment of column 2.

1.3 BASIC WEIGHT AND BALANCE RECORD - FORM C

The Form C (Figure 2) is a continuous history of the aircraft basic weight and moment detailing all structural and equipment changes during service. The last entry in the list denotes the current weight and balance status of the aircraft.

When the aircraft is delivered, the basic weight and moment will have been entered on the form by the manufacturer.

Additions or deletions to the basic weight and moment in Form C will be made when:
– Equipment is added to, or removed from the aircraft
– A complete inventory reveals equipment changes not previously recorded
– Significant structural changes are made to the aircraft
– There is an aircraft configuration
– The aircraft is reweighed.

1.4 WEIGHT AND BALANCE CLEARANCE - FORM F

The Form F (Figure 3) is a summary of the arrangement of loads on board the aircraft and has to be completed by a member of the flight crew before the aircraft can take-off. Two copies of Form F are left use by loading and refuelling personnel at stopover stations.

The completed forms serve as worksheets for the Weight and Balance technician. From the data recorded, the technician will be able to make calculations and carry out any corrections needed to ensure the aircraft is within its allowable weight and CG limits.

1.5 USE OF THE FORM F

Insert the necessary identifying information at the top of the form. In the blank spaces of the LIMITATIONS, enter the maximum weight and CG restrictions as indicated in this Manual.

The positions of the form F must be completed in according to the explanations given below:

a. Enter the aircraft BASIC EMPTY WEIGHT (BEW). Obtain these values from the last entry on Form C: Basic Weight and Balance Record.

b.Enter the amount, weight and moment crew, pilot and copilot, third crew member and loadmaster (Refer to CA-A-08-40-23-00O-000A-A).

c. Enter the weight and moment of the crew’s baggage, mission equipment, emergency, reserves, loads of toilet, loads of galley, etc. (Refer to CA-A-08-40-24-00O-000A-A).
d. Enter the sum of weights in Pos. 1, 2 and 3, to get the OPERATIONAL EMPTY WEIGHT (OEW).
e. Enter, according to the configuration, the weight and moment of passengers, paratroopers or loads.
f. Enter the sum of weight and moment of the Pos. 4 and 5. This weight is the ZERO FUEL WEIGHT (ZFW) and must be less than the MAXIMUM ZERO FUEL WEIGHT (MZFW).
g. Enter the weight and moment of fuel in main and auxiliary tanks. The weight of fuel used in warm-up and taxi shall not be included.
h. Enter the sum of weight and moment of Pos. 6 and 7. This weight is the TAKE-OFF WEIGHT.
If changes in amount or distribution of load are required, indicate them in OBSERVATIONS and CORRECTIONS table.
Do a check to make sure that these values do not exceed permitted limits.
Refer to the graph of WEIGHT AND BALANCE LIMITS to find the take-off CG position (Refer to CA-A-08-40-12-00A-000A-A).
i. N/A.
j. Enter the weight and moment (ZERO FUEL WEIGHT, ZFW) of position 6.
k. Enter the weight and moment of paratroopers and air delivery loads (if applicable).
Enter the weight and moment of the items to be expended before landing, and enter shift of crew or passengers to landing position with moment change due to movement.
l. Estimate the weight of fuel which may be expending before landing Enter the weight and moment. The fuel used in warm-up and taxi shall not be included.
m. Enter the algebraic sum of Pos. 10, 11 and 12. By referring to the graph of WEIGHT AND BALANCE LIMITS (Refer to CA-A-08-40-12-00A-000A-A). Find the estimated landing CG position.

The signatures must appear on the spaces at the bottom of the form.

Version: **Configuration:**							**X: In aircraft when weighed** **O: Not in aircraft weighed**				
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

FORM B AIRCRAFT WEIGHING RECORD (Sheet 1 of 2)					
DATE WEIGHED:	AIRCRAFT MODEL:		SERIAL NUMBER:		
PLACE WEIGHED:			WEIGHING PERSONNEL:		
REACTION	SCALE READING	TARE ✸	NET WEIGHT	ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
SUBTOTAL(BOTH MAIN)				17,088	
NOSE				4,792	
TOTAL					

✸ If tare is negative, add the tare to the scale reading to obtain nett weight.
If tare is positive, subtract the tare from the scale reading to obtain nett weight.

P_A = Reaction on forward weighing point.
$P_B(c)$ = Reaction on rear weighing point.
A = Distance from forward weighing point to ref. datum.
B = Distance from rear weighing points to ref. datum.
ΣP = Addition of reactions (weights): $P_A + P_B(c)$ (Kg.)
ΣM = Addition of moments: $P_A \cdot A + P_B(c) \cdot B$ (Kg·m)
C = Average arm: $\frac{\Sigma M}{\Sigma P}$

L.M.A.C. = 11,115 m. (36,45 ft)
M.A.C. = 2,561 m (8,4 ft)

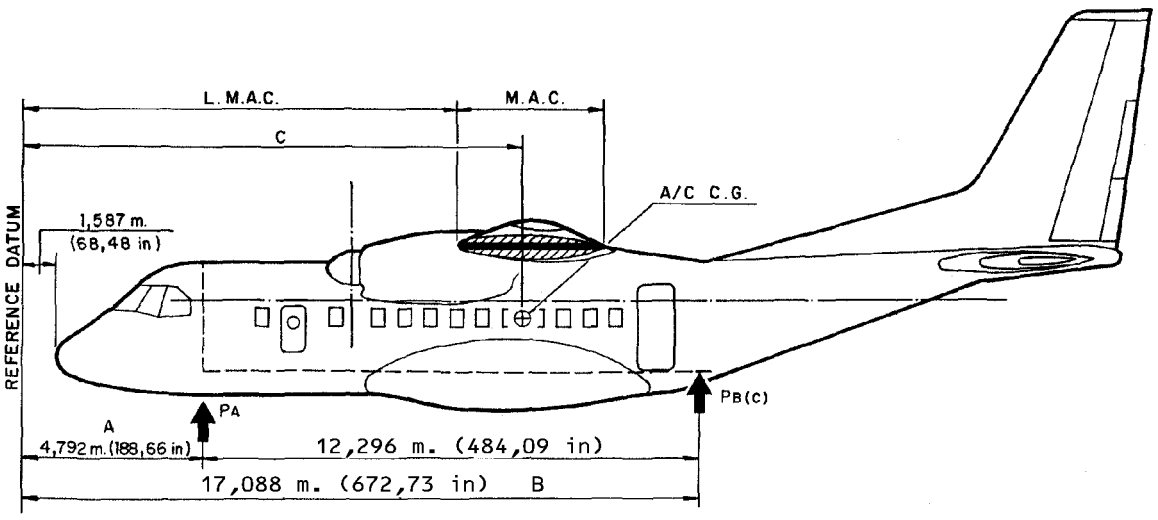

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Figure 1 Aircraft Weighing Record (sheet 1 of 2)

FORM B – AIRCRAFT WEIGHING RECORD (Sheet 2 of 2)

DESCRIPTION	NET WEIGHT	ARM	MOMENT
TOTAL			
OIL IN AIRCRAFT			
TOTAL OF ITEMS WEIGHED BUT NOT PART OF BASIC WEIGHT (FROM COL. I BELOW)			
TOTAL OF BASIC ITEMS NOT IN AIRCRAFT WHEN WEIGHED (FROM COL. II BELOW)			
BASIC AIRCRAFT			

COLUMN I				COLUMN II			
ITEMS WEIGHED BUT NOT PART OF BASIC WEIGHT	WEIGHT	ARM	MOMENT	BASIC ITEMS NOT IN AIRCRAFT WHEN WEIGHED	WEIGHT	ARM	MOMENT
TOTAL				TOTAL			
REACTIONS USED				TYPE SCALES			

BASIC AIRCRAFT

CALCULATION OF AVERAGE ARM

$$C = \frac{\text{Addition of moments}}{\text{Addition of weights}} = \ldots\ldots\ldots\ldots$$

C.G. POSITION INDEX CALCULATION (% MAC)

$$\%\ M.A.C. = \frac{C - L\ M.A.C.}{M.A.C.} \times 100 = \ldots\ldots\ldots\ \%\ M.A.C.$$

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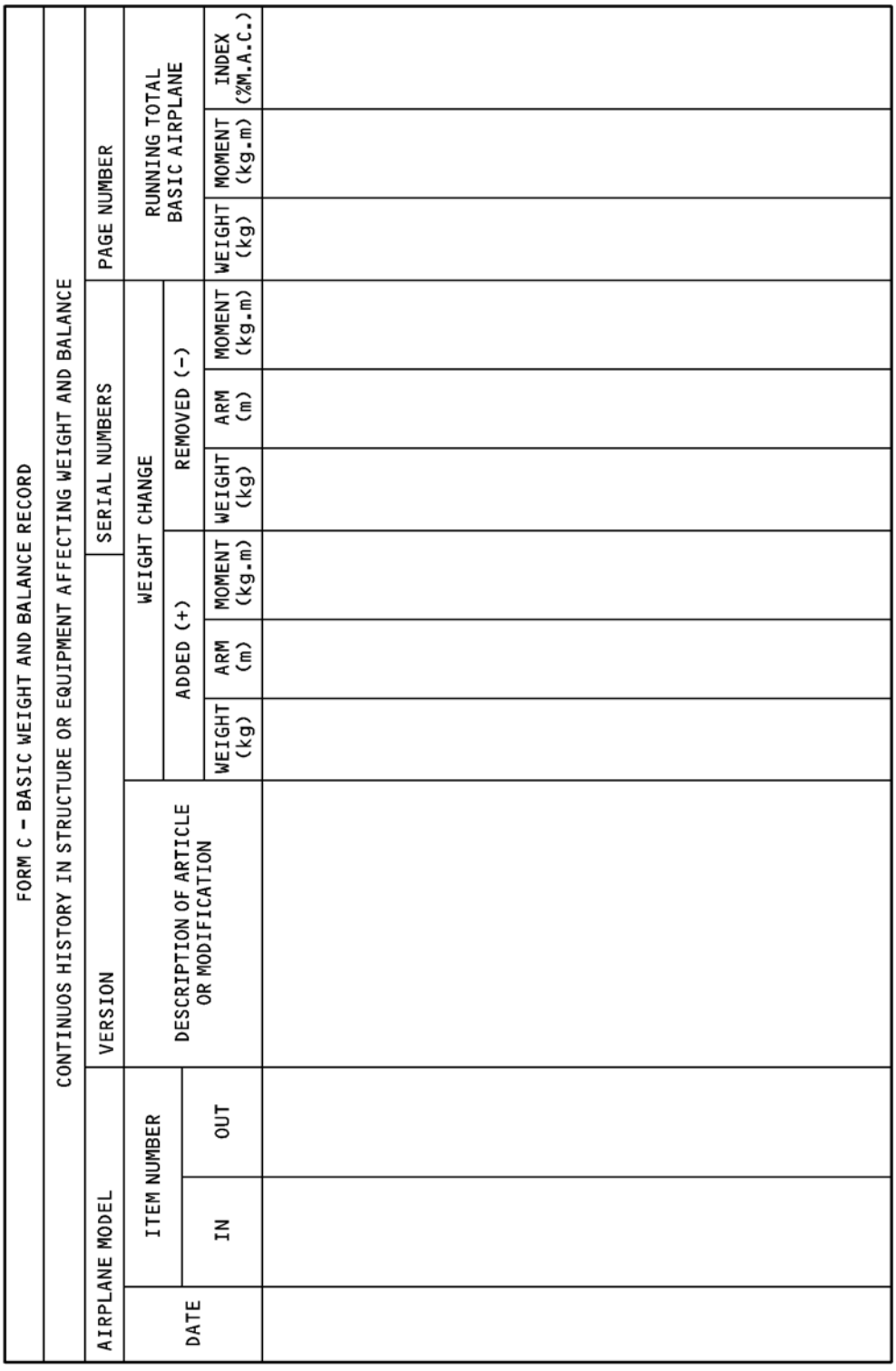
Figure 1 Aircraft Weighing Record (sheet 2 of 2)



CA-A-080010-07523-A02

ICN-CA-A-080010-I-0117B-07523-A-02-1

Figure 2 Basic Weight and Balance Record

FORM F-WEIGHT AND BALANCE CLEARANCE

DATE	AIRPLANE	FROM:	HOME STATION
MISSION/TRIP/FLIGHT/No	SERIAL No	TO:	PILOT

POS		ITEM	WEIGHT	H-ARM	MOMENT	LIMITATION	% MAC
1		BASIC EMPTY WEIGHT (BEW)				PERMISSIBLE CENTER OF GRAVITY 13,5%-32% MAC	
2	CREW MEMBER	PILOT AND COPILOT					
		3th CREW MEMBER					
		LOAD MASTER					
		AUXILIARY CREW MEMBER					
3	OPERATIONAL EQUIPMENTS	CREW'S BAGGAGE					
		MISSION EQUIPMENT					
		EMERGENCY EQUIPMENT					
		OTHERS EQUIPMENTS					
4		OPERATIONAL EMPTY WEIGHT (O.E.W) 1+2+3					
5	PASS/LOAD	PASSENGER/PARACHUT					
		LOAD					
6	MAX. ZERO FUEL WEIGHT	MAX. NORMAL=18500 (4+5)					
		MAX. LOGISTICAL=20700 (4+5)					
		MAX. ASSAULT=16500 (4+5)					
7	T-O FUEL	MAIN TANKS					
		AUXILIARY TANKS					
8		TAKE-OFF WEIGHT (6+7) (Weight and CG Limitation)					

REMARK:

10		ZERO FUEL WEIGHT (6)					
11	AIRDELIVERY	PARACHUTISTS					
		LOAD					
12	LANDING FUEL	MAIN TANKS					
		AUXILIARY TANKS					
13		LANDING WEIGHT (10-11+12) (Weight and CG Limitation)					

COMPUTED BY	WEIGHT AND BALANCE AUTHORITY	PILOT
NAME:	NAME:	NAME:
SIGNATURE	SIGNATURE	SIGNATURE

ICN-CA-A-080010-I-0117B-07524-A-001

CA-A-080010-07524-A00

Figure 3 Weight and Balance Clearance

LIST OF EFFECTIVE PAGES

DMC	PAGES	DATE
CA-A-08-20-00-00A-040A-A	1 to 1	15/10/2014
CA-A-08-21-00-00A-912A-A	1 to 3	15/10/2014

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LEVELING
Description

1 GENERAL

To do the leveling operation, the aircraft must be on jacks with all wheels clear of the ground.

There are two different procedures to do this operation:
– Quick Leveling (Refer to CA-A-08-21-00-00A-912A-A).
– Precise Leveling (Refer to CA-A-08-22-00-00A-912A-A).

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QUICK LEVELING
Maintenance Practices

REQUIRED CONDITIONS:

Condition	Data Module/Technical Publication
The aircraft in safe conditions for maintenance tasks	CA-A-12-00-00-00A-010A-A
The aircraft lifted on jacks for maintenance tasks	CA-A-07-11-00-00A-912A-A

SUPPORT EQUIPMENT:
None

SUPPLIES:
None

SPARES:
None

SAFETY CONDITIONS:
None

Procedure

1. Reason for the Job

To do the quick leveling of the aircraft. For this, there is a leveling plate and a point to hang a plumb bob. They are in the RH front section of the center fuselage, in the flight compartment, at STA 4309.

2. Aircraft Leveling (Figure 1)

2.1. Remove the screws (5). Put the cover (4) down.

2.2. Remove the hanging point (1) from its stowage.

2.3. Remove the plumb bob (7) from its stowage (2).

2.4. Remove the screw (8) from its housing (3).

2.5. Install the screw (8) in the hanging point (1).

2.6. Install the plumb bob (7) in the screw (8).

2.7. Adjust each jack until the plumb bob (7) is correctly on the center of the leveling plate (6).

2.8. Make sure that the jack lock rings are fully engaged (Refer to CA-A-07-11-00-00A-912A-A).

3. Close up

3.1. Remove the plumb bob (7) from the screw (8). Put the plumb bob (7) in its stowage (2) (Figure 1).

3.2. Remove the screw (8) from the hanging point (1). Put the screw (8) in its stowage (3) (Figure 1).

3.3. Put the hanging point (1) in its stowage (Figure 1).

3.4. Close the cover (4). Attach the cover with the screws (5) (Figure 1).

3.5. Lower the aircraft. Remove the jacks (Refer to CA-A-07-11-00-00A-912A-A).

3.6. If applicable, do the operations necessary to put the aircraft in the configuration before the start of the maintenance tasks (Refer to CA-A-12-00-00-00A-010A-A).

3.7. Remove all tools and equipment from the work area. Make sure that the work area is clean.

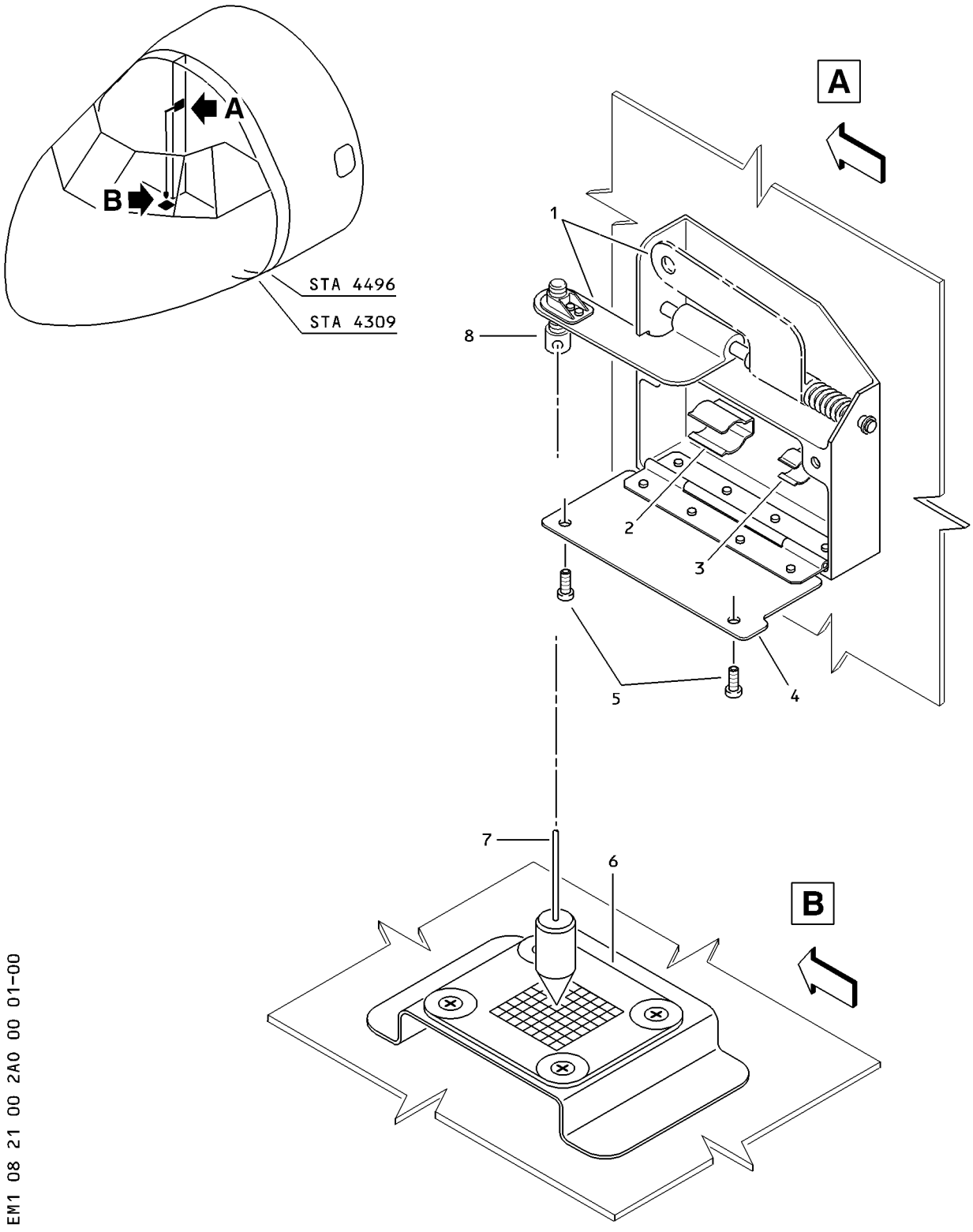

Figure 1 Quick Leveling

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LIST OF EFFECTIVE PAGES

DMC	PAGES	DATE
CA-A-08-30-00-00Q-000A-A	1 to 1	15/10/2014
CA-A-08-30-10-00A-912A-A	1 to 4	15/11/2017
CA-A-08-30-20-00A-000A-A	1 to 5	15/11/2017
CA-A-08-30-21-00Q-000A-A	1 to 1	15/10/2018
CA-A-08-30-22-00R-000A-A	1 to 3	15/10/2018
CA-A-08-30-22-01R-000A-A	1 to 1	15/11/2017
CA-A-08-30-23-00Q-000A-A	1 to 4	15/11/2017
CA-A-08-30-24-00Q-000A-A	1 to 3	15/11/2017
CA-A-08-30-25-00Q-000A-A	1 to 2	15/11/2017
CA-A-08-30-26-00Q-000A-A	1 to 1	15/10/2018

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WEIGHING
Function, data for plans and description

1 GENERAL

This section gives detailed procedures to calculate the basic empty weight and its associated center of gravity location. The C- 295 aircraft must be operated within approved weight and balance limitations. It is essential that an accurate basic empty weight and center of gravity established. This is accomplished by weighing the airplane.

This section gives data about:
– Weighing Procedure (Refer to CA-A-08-30-10-00A-912A-A)
– Weighing Reports (Refer to CA-A-08-30-20-00A-000A-A)
– Basic Weight Checklist (Form A) (Refer to CA-A-08-30-21-00Q-000A-A)

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WEIGHING
Maintenance Practices

REQUIRED CONDITIONS:

Condition	Data Module/Technical Publication
The aircraft in a closed hangar, free from drafts and strong air currents	
The aircraft in safe conditions for maintenance tasks and in as full condition as possible	CA-A-12-00-00-00A-010A-A
The fuel tanks, pipes and pumps fully dry or drained	CA-A-12-11-28-00A-200A-A
The engine and propellers systems and the lubricating oil tanks fully dry or serviced to the "FULL" level with the aircraft in a zero roll. The oil quantity in each tank must be checked and recorded to find the tare oil weight.	CA-A-12-13-79-00A-212A-A
The hydraulic reservoir filled to its operation capacity	CA-A-12-12-29-00A-212A-A
The accumulators charged to its operation capacity	CA-A-12-14-32-00A-200A-A
The crew oxygen bottle filled	CA-A-35-31-00-00A-300A-A
The engine fire extinguishers filled	CA-A-26-21-00-00A-300A-A
The hand fire extinguishers filled	CA-A-26-22-00-00A-310A-A
The water closet fully empty	CA-A-12-15-38-00A-258A-A
The aircraft interior and exterior clean and dry The water tank in the galley empty	CA-A-12-21-00-00A-040A-A

REQUIRED PERSONS:

Pers id	Ssc	Skill
A	WEIGHT MASTER	A
	WEIGHT ASSISTANT	B
	GROUND PERSSONEL	A

as required as required

SUPPORT EQUIPMENT:

Item	Nomenclature	Identification No.	Qty
1	Aircraft Weighing Kit	CAAAH080100A066AA	–1
2	Base Adapters	No specific	–3
3	Threaded Plug	No specific	–3

SUPPLIES:
None

SPARES:
None

SAFETY CONDITIONS:
None

Procedure

1. Reason for the Job

This subsection of the manual describes a procedure for levelling and weighing the aircraft. It includes instructions for preparing the airplane for weighing, equipment required and method for weighing.

You can use mechanical weighing scales or electronic load sensing equipment to weight the aircraft. The electronic method is the one recommended for the C-295 aircraft and is described in this subsection.

2. Weighing Preparation

2.1. Required Persons:
- Three ground personnel to operate the jacks and any other tasks that involve handling the airplane or its equipment.
- One weight master to operate the electronic weighing kit and to supervise the weighing operation.
- One or more personnel to assist the weight master in determining the condition of the aircraft being weighed.

2.2. Weighing Area

Park the aircraft in a closed hangar, free from drafts and strong air currents. Make sure that the atmosphere is of minimum humidity and that the temperature is constant. The hangar floor should be level and there should be sufficient headroom to operate the aircraft.

NOTE

Any disturbance of air in the vicinity of the aircraft will cause fluctuation of reading on the weighing equipment.

2.3. Aircraft Position

CAUTION

MAKE SURE THAT THE LANDING GEAR GROUND LOCK PINS ARE INSTALLED AND STATIC GROUND CABLES ARE CONNECTED.

2.3.1. Put the aircraft in the weighing area. Do not the brakes, use chocks to keep the aircraft from rolling.

2.3.2. Do a check of the aircraft exterior for interference with work stands and other equipment.

2.3.3. Do a check of all landing gear shock absorbers for correct pressures and extension.

2.4. Use the BASIC WEIGHT CHECKLIST to do a check of the aircraft equipment (Refer to CA-A-08-30-21-00Q-000A-A).

NOTE

All removable items and instruments should be installed in their usual in-flight positions.

NOTE

Remove the covers not listed in the Basic Weight Checklist. The protective covers listed in this list should be stored in their usual in-flight positions.

WARNING

BEFORE YOU REMOVE THE BALLAST MAKE SURE THAT THE AIRCRAFT CENTER OF GRAVITY WILL NOT EXCEED THE PERMITTED MAXIMUM LIMITS OF THE FORWARD CENTER OF GRAVITY FOR AIRCRAFT WEIGHING.

2.5. Remove ballast, tools and superfluous items from the aircraft.

2.6. Make sure that all removable hatches are installed and close all doors and windows.

3. Weighing

3.1. Connect the cables to the load cells, connect the weighing kit to the power supply and turn on the kit to let the warm up.

3.2. Put the jacks below the main jacking points (Refer to CA-A-07-11-00-00A-912A-A). Connect the weighing cells to unit and install the cells and adapters to jacks.

3.3. Release the aircraft brakes.

3.4. Do the quick leveling procedure for the aircraft (Refer to CA-A-08-21-00-00A-912A-A).

3.5. Do the weighing procedure as described in the Weighing Unit Manual. Record the weight for each cell.

3.6. Get the tare weight for each weighing point and record the values in Aircraft Weighing Form (Refer to CA-A-08-30-20-00A-000A-A).

CAUTION

THE TWO JACKS MUST BE OPERATED SIMULTANEOUSLY.

3.7. Lift the rear fuselage points until load each cell reads approximately 2000 pounds.

3.8. Lift the forward fuselage point until the load cell reads approximately 500 pounds.

3.9. Let load cells stay loaded for time required to stabilize the cells and to let the kit warm up to operating temperature.

3.10. Lower forward fuselage jack until load cell is disengaged.

3.11. Lower rear fuselage jacks until load cells are disengaged.

3.12. Set the indicators of the electronic weighing kit to zero.

3.13. Level the aircraft following the approved procedures. Lift the forward fuselage to level the aircraft longitudinally. Lift the rear fuselage to level the aircraft laterally.

3.14. Jack forward fuselage and rear fuselage simultaneously until the tires are clear of floor.

3.15. Record the scale readings on appropriate places in Airplane Weighing Form.

CAUTION

LOWER ALL THE JACKS SIMULTANEOUSLY, TO KEEP THE LEVEL CONDITION UNTIL THE AIRCRAFT TOUCHES THE GROUND.

3.16. Lower all jacks.

CAUTION

DO NOT MOVE OR CHANGE THE LOAD CELLS UNTIL THEY ARE FULLY DISENGAGED.

3.17. Lower all the jacks until load cells are disengaged.

3.18. Record the load cell drift corrections in aircraft weighing form, below the scale correction column.

3.19. Do the step 3.5 thru step 3.18 again with cells put in all possible cell-to-jacking point combination. Average out recorded values at each jacking point before to get the value that you must record on Airplane Weighing Form.

4. Close up

4.1. If applicable, do the operations necessary to put the aircraft in the configuration before the start of the maintenance tasks (Refer to CA-A-12-00-00-00A-010A-A).

4.2. Remove all tools and equipment from the work area. Make sure that the work area is clean.

REPORTS
Weighing Reports

1 WEIGHING REPORTS

This section includes the weighing reports which give the OEW/MEW and CG of the aircraft from the weighing.

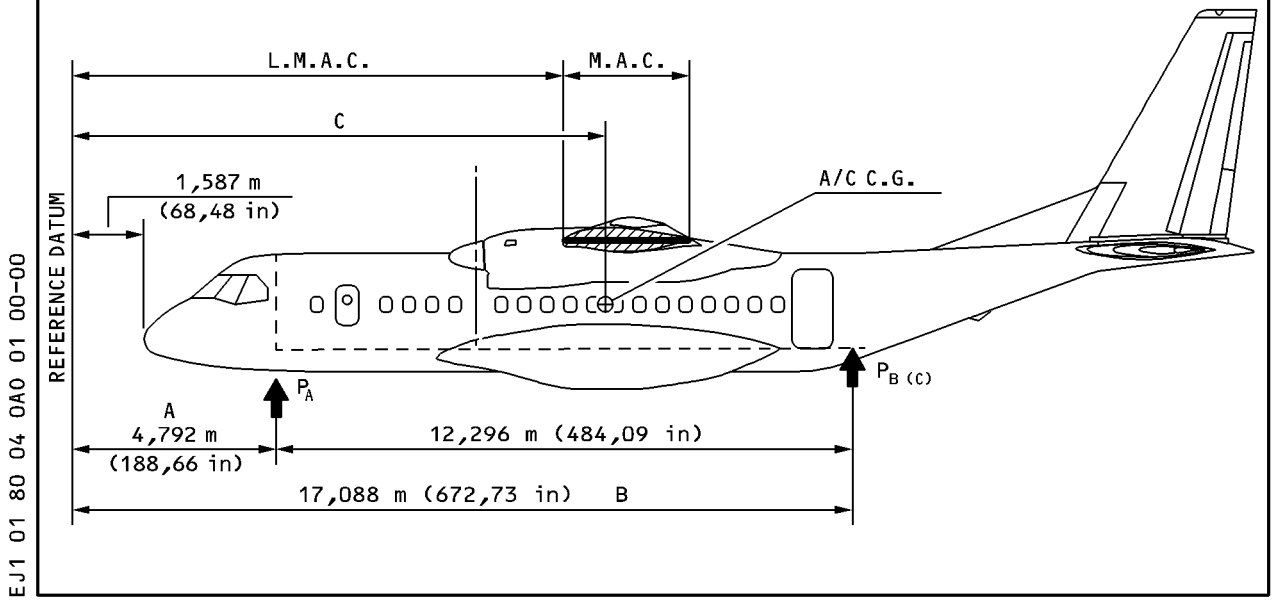
To perform these reports it is included:
– FORM B - AIRCRAFT WEIGHING RECORD (Figure 1)
– FORM C - BASIC WEIGHT AND BALANCE RECORD (Figure 2)
– FORM F - WEIGHT AND BALANCE CLEARANCE (Figure 3)

FORM B – AIRCRAFT WEIGHING RECORD (Sheet 1 of 2)					
DATE WEIGHED:	AIRCRAFT MODEL:		SERIAL NUMBER:		
PLACE WEIGHED:			WEIGHING PERSONNEL:		
REACTION	SCALE READING	TARE (*)	NET WEIGHT	ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
SUBTOTAL(BOTH MAIN)				17,088	
NOSE				4,792	
TOTAL					

(*) If tare is negative, add the tare to the scale reading to optain nett weight.
If tare is positive, subtract the tare from the scale reading to optain nett weight.

P_A = Reaction on forward weighing point
$P_{B\ (C)}$ = Reaction on rear weighing point
A = Distance from forward weighing point to reference datum
B = Distance from rear weighing points to reference datum
ΣP = Addition of reactions (weights): $P_A + P_{B\ (C)}$ (Kg)
ΣM = Addition of moments: $P_A \cdot A + P_{B\ (C)} \cdot B$ (Kg.m)
C = Average arm: $\frac{\Sigma M}{\Sigma P}$

L.M.A.C. = 11,115 m (36,45 ft)
M.A.C. = 2,561 m (8,4 ft)



ICN-CA-A-080010-I-0117B-07521-A-01-1

Figure 1 Form B - Aircraft Weighing Record (sheet 1 of 2)

FORM B - AIRCRAFT WEIGHING RECORD (SHEET 2 OF 2)

DESCRIPTION	NET WEIGHT	ARM	MOMENT
TOTAL			
OIL IN AIRCRAFT			
TOTAL OF ITEMS WEIGHED BUT NOT PART OF BASIC WEIGHT (FROM COL. I BELOW)			
TOTAL OF BASIC ITEMS NOT IN AIRCRAFT WHEN WEIGHED (FROM COL. II BELOW)			
BASIC AIRCRAFT			

COLUMN I				COLUMN II			
ITEMS WEIGHED BUT NOT PART OF BASIC WEIGHT	WEIGHT	ARM	MOMENT	BASIC ITEMS NOT IN AIRCRAFT WHEN WEIGHED	WEIGHT	ARM	MOMENT
TOTAL				TOTAL			
REACTIONS USED				TYPE SCALES			

BASIC AIRCRAFT

CALCULATION OF AVERAGE ARM

$$C = \frac{\text{Addition of moments}}{\text{Addition of weights}} = \text{. . . . .}$$

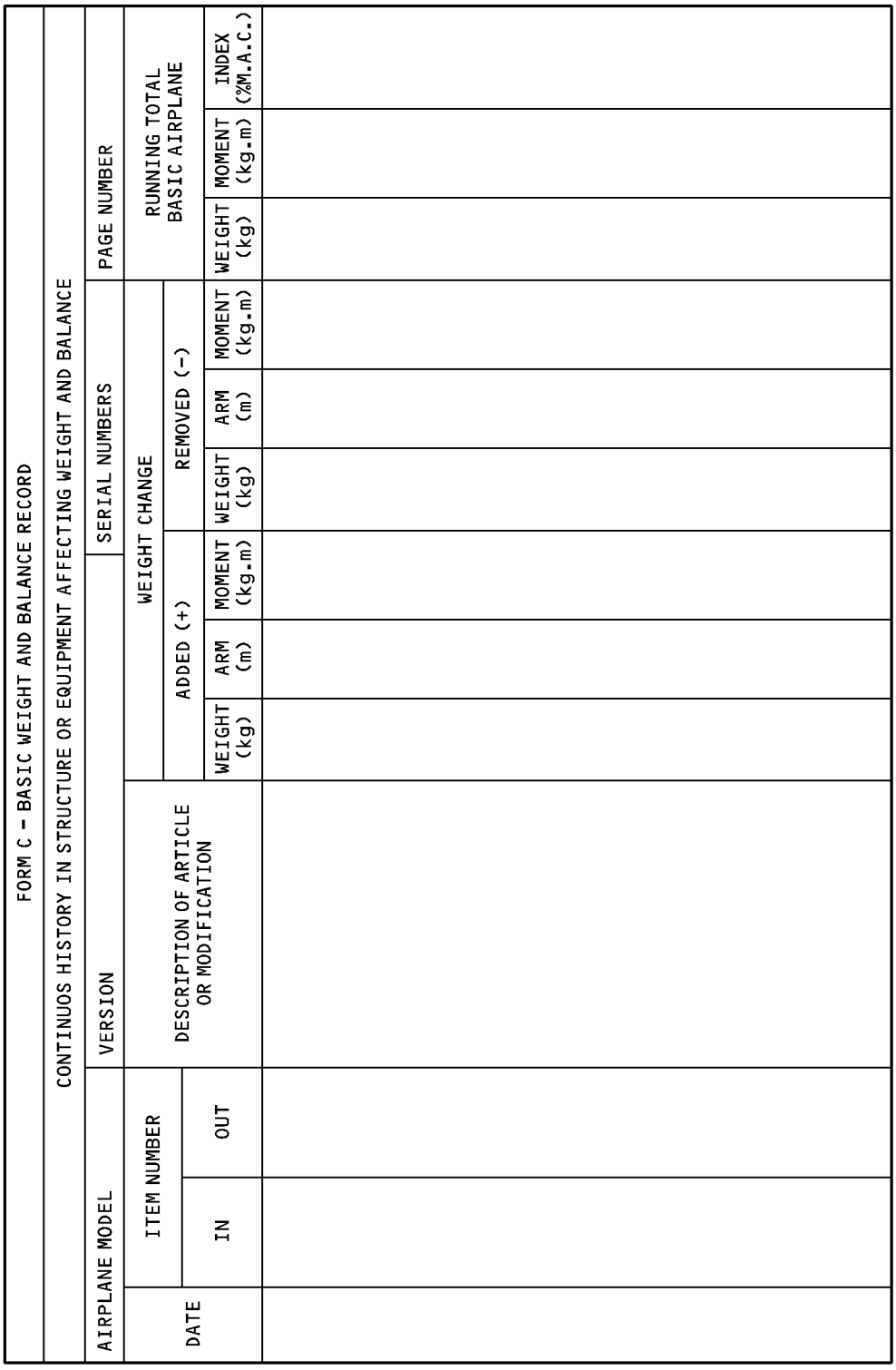
C.G. POSITION INDEX CALCULATION (% MAC)

$$\% \text{ M.A.C.} = \frac{\text{C - L.M.A.C.}}{\text{M.A.C.}} \times 100 = \text{. . . . . \% M.A.C.}$$

EJ1 01 80 04 0A0 02 00-00

ICN-CA-A-080010-I-0117B-07522-A-01-1

Figure 1 Form B - Aircraft Weighing Record (sheet 2 of 2)



EJ1 01 08 05 0A0 00 00-01

ICN-CA-A-080010-I-0117B-07523-A-01-1

Figure 2 Form C - Basic Weight and Balance Record

FORM F-WEIGHT AND BALANCE CLEARANCE

DATE	AIRPLANE	FROM:	HOME STATION
MISSION/TRIP/FLIGHT/No	SERIAL No	TO:	PILOT

POS		ITEM	WEIGHT	H-ARM	MOMENT	LIMITATION	% MAC
1		BASIC EMPTY WEIGHT (BEW)				PERMISSIBLE CENTER OF GRAVITY 13,5%-32% MAC	
2	CREW MEMBER	PILOT AND COPILOT					
		3th CREW MEMBER					
		LOAD MASTER					
		AUXILIARY CREW MEMBER					
3	OPERATIONAL EQUIPMENTS	CREW'S BAGGAGE					
		MISSION EQUIPMENT					
		EMERGENCY EQUIPMENT					
		OTHERS EQUIPMENTS					
4		OPERATIONAL EMPTY WEIGHT (O.E.W) 1+2+3					
5	PASS/LOAD	PASSENGER/PARACHUT					
		LOAD					
6	MAX. ZERO FUEL WEIGHT	MAX. NORMAL=18500 (4+5)					
		MAX. LOGISTICAL=20700 (4+5)					
		MAX. ASSAULT=16500 (4+5)					
7	T-O FUEL	MAIN TANKS					
		AUXILIARY TANKS					
8		TAKE-OFF WEIGHT (6+7) (Weight and CG Limitation)					

REMARK:

10		ZERO FUEL WEIGHT (6)					
11	AIRDELIVERY	PARACHUTISTS					
		LOAD					
12	LANDING FUEL	MAIN TANKS					
		AUXILIARY TANKS					
13		LANDING WEIGHT (10-11+12) (Weight and CG Limitation)					

COMPUTED BY	WEIGHT AND BALANCE AUTHORITY	PILOT
NAME:	NAME:	NAME:
SIGNATURE	SIGNATURE	SIGNATURE

ICN-CA-A-080010-I-0117B-07524-A-001

CA-A-080010-07524-A00

Figure 3 Form F - Weight and Balance Clearance

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REPORTS
Weighing Checklist

1 GENERAL

This section gives the Form A which is divided according to the configurations of the aircraft use. These configurations are as follows:

- Manufacturer Items (Refer to CA-A-08-30-22-00R-000A-A).
  - –Standard Items (Refer to CA-A-08-30-22-01R-000A-A). Those items that form part of the Basic Empty Weight (BEW) of the aircraft, in any of the configurations
- Troop Transport Configuration (Refer to CA-A-08-30-23-00Q-000A-A).
- Paratroop Air Drop Configuration (Refer to CA-A-08-30-24-00Q-000A-A).
- Medical Evacuation Configurations (Refer to CA-A-08-30-25-00Q-000A-A).
- Cargo Transport/Air Drop Load Configuration (Refer to CA-A-08-30-26-00Q-000A-A).

2 USE

To calculate the BEW in a defined configuration, e.g. the passengers configuration, proceed as follows:

BEW = MEW + SI

Being:

BEW: The basic empty weight for cargo configuration.

MEW: The manufacturer's basic empty weight (Refer to CA-A-08-00-00-00A-006A-A).

SI: The standard items (Refer to CA-A-08-30-22-01R-000A-A).

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REPORTS
Basic Weight Checklist Manufacturer Items

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: MANUFACTURER ITEMS**							**X: In aircraft when weighed** **O: Not in aircraft when weighed**				
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**
1	Magnetic Compass	ACN411260	1	0,03	3,366	0,10					
2	Sunvisor	35–65218–00	2	0,32	3,432	1,10					
3	Projector Light	ACN10060	2	0,68	3,708	2,16					
4	Utility Lights	ACN100148	2	0,77	3,881	2,99					
5	Pilot Escape Strap	AC760120	2	0,27	3,970	1,07					
6	Crew Oxygen Mask	AC910033	3	2,53	4,190	10,60					
7	Portable Breathing Equipment (PBE)	AC910043	1	2,34	4,248	9,94					
8	Smoke Goggles	AC910034	3	0,33	4,259	1,41					
9	Smoke Goggles Box	AC910049	3	0,30	4,259	1,28					
10	Light-Pull Emergency	AC110096	1	0,33	4,309	1,42					
11	Observer Reading Light	AC111055	1	0,27	4,309	1,16					
12	Axe	AC760336	1	1,41	4,330	6,11					
13	Third Crew Member Seat	AC711003	1	16,20	4,336	70,24					
14	Portable Oxygen Bottle	AC910025	2	7,25	4,570	33,13					
			2	7,25	5,166	37,45					
15	Passenger Oxygen Mask	AC910028	4	0,42	4,695	1,97					
			2	0,21	5,291	1,11					
16	Emergency Rack	AC25C0020	1	50,00	4,644	232,20					
17	Locker Assy — Electronic	AC711113	1	13,30	4,644	61,77					
18	Oven	AC711111	1	7,00	4,644	32,51					
19	Cup-Hot	AC711152	1	1,80	4,644	8,36					
20	Control Pendant	AC711068	1	1,50	4,644	6,97					

Version: VT01
Configuration: MANUFACTURER ITEMS

X: In aircraft when weighed
O: Not in aircraft when weighed

Pos.	Item Description		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of Checking				
							1	2	3	4	5
21	First-Aid.-Kit	AC820169	1	0,87	4,644	4,04					
			1	0,87	9,833	8,55					
			1	0,87	10,559	9,19					
			1	0,87	13,647	11,87					
			1	0,87	13,897	12,09					
22	Opt-Military Door Toilet	95–96314–00	1	19,18	4,862	93,25					
23	Toilet-Recirculating	AC890011	1	8,00	4,816	38,53					
24	Extinguisher	AC810033	1	1,66	4,259	7,07					
			1	1,66	5,166	8,56					
25	Extinguisher (H2O)	AC810034	1	3,12	5,166	16,12					
26	Therapeutic Oxygen Mask	AC910029A	2	0,21	5,291	1,11					
27	Winch	AC711050	1	31,00	5,544	171,86					
28	Parachutist Equipped Cable	95–94060–00	2	15,34	13,636	209,18					
29	Ramp Cover Assy	95–94056–00	1	6,80	17.190	116,89					
30	Equipped Curtain	95–81485–00	1	3,30	17,190	56,73					
31	Stowage Bag	35–94117–00	2	1,28	17,359	22,22					
32	Transversal Rod in Door (Stowed)	35–94061–00	1	1,70	18,145	30,85					
33	Air Baffles	95–94077–00	2	11,19	18,687	209,11					
34	Load Jack (Stowed)	AC711080	2	15,15	19,375	293,53					
35	Transversal Rod in Ramp	95–81491–0001	1	4,24	19,560	82,93					
36	Telescopic Bar Assy	95–94070–00	2	8,00	20,232	161,86					
37	Stowage Bag Kit	35–94249–00	1	4,53	20,570	93,18					
38	Tie Down (Stowed)	CGU-1/B-CLASS2	22	37,44	20,570	770,14					

Version: VT01 Configuration: MANUFACTURER ITEMS							X: In aircraft when weighed O: Not in aircraft when weighed				
Pos.	Item Description		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of Checking				
							1	2	3	4	5
39	Equipped Tooling Bag	35–91015–00	1	7,14	20,570	146,87					
40	Tie Down Ring	Included in AC711046A	136	18,50	20,739	383,67					
41	Lateral — Rails Metric Systems (AC711046A)										
	Cargo Cabin (Fixed)		16	146,40	11,232	1644,36					
	Parachutist Door (Stowed)		2	18,20	15,042	273,76					
	Parachutist Door (Installed)			18,20	16,081	292,67					
	Ramp Area		2	14,10	17,866	251,91					
			2	14,10	19,218	270,97					
42	Passageway (Stowed)	95–94050–00	2	18,99	21,415	406,67					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

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WEIGHT AND BALANCE
Basic Weight Checklist Standard Items

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: STANDARD ITEMS**						**X: In aircraft when weighed** **O: Not in aircraft when weighed**					
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**
1	W.C. Liquids		1	25,00	4,847	121,18					
2	Engine Oil		1	44,91	10,445	469,08					
3	Unusable Fuel										
	Trapped		1	64,60	10,069	650,46					
	Drainable		1	31,80	12,262	389,93					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

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REPORTS
Basic Weight Checklist Troop Transport Configuration

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: TROOP TRANSPORT**							**X: In aircraft when weighed** **O: Not in aircraft when weighed**				
Pos.	**ITEM DESCRIPTION**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of checking**				
							1	**2**	**3**	**4**	**5**
1	SIMPLE SEAT 1L + BELT	95–94066 –00	1	3,10	5,494	17,03					
2	DOUBLE SEAT 2L + BELT	95–94064 –00	1	5,30	6,190	32,81					
3	DOUBLE SEAT 3L + BELT	95–94064 –00	1	5,30	7,104	37,65					
4	DOUBLE SEAT 4L + BELT	95–94064 –00	1	5,30	8.018	42,50					
5	DOUBLE SEAT 5L + BELT	95–94064 –00	1	5,30	8,933	47,34					
6	DOUBLE SEAT 6L + BELT	95–94064 –00	1	5,30	9,847	52,19					
7	DOUBLE SEAT 7L + BELT	95–94064 –00	1	5,30	10,762	57,04					
8	SIMPLE SEAT 8L + BELT	95–94064 –00	1	5,30	11,677	61,89					
9	DOUBLE SEAT 9L + BELT	95–94064 –00	1	5,30	12,590	66,73					
10	DOUBLE SEAT 10L + BELT	95–94064 –00	1	5,30	13,505	71,58					
11	DOUBLE SEAT 10L + BELT	95–94064 –00	1	5,30	14,419	76,42					
12	DOUBLE SEAT 12L + BELT	95–94064 –00	1	5,30	15,334	81,27					
13	DOUBLE SEAT 13L + BELT	95–94507 –00	1	6,08	16,312	99,18					
14	DOUBLE SEAT 1R + BELT	95–94064 –00	1	5,30	6,190	32,81					
15	DOUBLE SEAT 2R + BELT	95–94064 –00	1	5,30	7,104	37,65					
16	DOUBLE SEAT 3R + BELT	95–94064 –00	1	5,30	8,018	42,50					
17	DOUBLE SEAT 4R + BELT	95–94064 –00	1	5,30	8,933	47,34					

Version: VT01 Configuration: TROOP TRANSPORT							X: In aircraft when weighed O: Not in aircraft when weighed				
Pos.	ITEM DESCRIPTION		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of checking				
							1	2	3	4	5
18	DOUBLE SEAT 5R + BELT	95–94064 –00	1	5,30	9,847	52,19					
19	SIMPLE SEAT 6R + BELT	95–94066 –00	1	3,10	10,533	32,65					
20	SIMPLE SEAT 7R + BELT	95–94066 –00	1	3,10	10,990	34,07					
21	DOUBLE SEAT 8R + BELT	95–94064 –00	1	5,30	11,676	61,88					
22	DOUBLE SEAT 9R + BELT	95–94064 –00	1	5,30	12,590	66,73					
23	DOUBLE SEAT 10R + BELT	95–94064 –00	1	5,30	13,505	71,58					
24	DOUBLE SEAT 11R + BELT	95–94064 –00	1	5,30	14,419	76,42					
25	DOUBLE SEAT 12R + BELT	95–94064 –00	1	5,30	15,334	81,27					
26	DOUBLE SEAT 13R + BELT	95–94507 –00	1	6,08	16,312	99,18					
27	DOUBLE SEAT 1C + BELT	95–94064 –00	1	5,30	6,088	32,27					
28	SIMPLE SEAT 2C + BELT	95–94066 –00	1	3,10	6,774	20,91					
29	DOUBLE SEAT 3C + BELT	95–94064 –00	1	5,30	7,561	40,07					
30	SIMPLE SEAT 4C + BELT	95–94066 –00	1	3,10	8,247	25,57					
31	DOUBLE SEAT 5C + BELT	95–94064 –00	1	5,30	9,034	47,88					
32	SIMPLE SEAT 6C + BELT	95–94066 –00	1	3,10	9,720	30,13					
33	DOUBLE SEAT 7C + BELT	95–94064 –00	1	5,30	10,508	55,69					
34	SIMPLE SEAT 8C + BELT	95–94066 –00	1	3,10	11,193	34,70					
35	DOUBLE SEAT 9C + BELT	95–94064 –00	1	5,30	11,981	63,50					
36	SIMPLE SEAT 10C + BELT	95–94066 –00	1	3,10	12,667	39,27					

Version: VT01 Configuration: TROOP TRANSPORT							X: In aircraft when weighed O: Not in aircraft when weighed				
Pos.	ITEM DESCRIPTION		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of checking				
							1	2	3	4	5
37	DOUBLE SEAT 11C + BELT	95–94064 –00	1	5,30	13,454	71,31					
38	SIMPLE SEAT 12C + BELT	95–94066 –00	1	3,10	14,140	43,83					
39	DOUBLE SEAT 13C + BELT	95–94064 –00	1	5,30	14,927	79,11					
40	SIMPLE SEAT 14C + BELT	95–94066 –00	1	3,10	15,613	48,40					
41	VERTICAL STRUCTURE										
			1	5,30	5,619	29,78					
			1	5,30	7,092	37,59					
			1	5,30	8,524	45,18					
			1	5,30	9,987	52,93					
			1	5,30	11,461	60,74					
			1	5,30	12,934	68,55					
			1	5,30	14,407	76,36					
			1	5,30	15,580	82,57					
42	HORIZONTAL STRUCTURE										
			1	6,80	6,304	42,87					
			1	6,80	7,777	52,88					
			1	6,80	9,251	62,91					
			1	6,80	10,724	72,92					
			1	6,80	12,197	82,94					
			1	6,80	13,670	92,96					
			1	6,80	15,154	103,05					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

REPORTS
BasicWeight Checklist Paratroop Configuration

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: PARATROOP TRANSPORT**							**X: In aircraft when weighed** **O: Not in aircraft when weighed**				
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**
1	SIMPLE SEAT 1L + BELT	95–94066 –00	1	3,10	5,494	17,03					
2	DOUBLE SEAT 2L + BELT	95–94064 –00	1	5,30	6,190	32,81					
3	DOUBLE SEAT 3L + BELT	95–94064 –00	1	5,30	7,104	37,65					
4	DOUBLE SEAT 4L + BELT	95–94064 –00	1	5,30	8,018	42,50					
5	DOUBLE SEAT 5L + BELT	95–94064 –00	1	5,30	8,933	47,34					
6	DOUBLE SEAT 5L + BELT	95–94064 –00	1	5,30	9,847	52,19					
7	DOUBLE SEAT 7L + BELT	95–94064 –00	1	5,30	10,762	57,04					
8	SIMPLE SEAT 8L + BELT	95–94064 –00	1	5,30	11,677	61,89					
9	DOUBLE SEAT 9L + BELT	95–94064 –00	1	5,30	12,590	66,73					
10	DOUBLE SEAT 10L + BELT	95–94064 –00	1	5,30	13,505	71,58					
11	DOUBLE SEAT 11L + BELT	95–94064 –00	1	5,30	14,419	76,42					
12	DOUBLE SEAT 12L + BELT	95–94064 –00	1	5,30	15,334	81,27					
13	DOUBLE SEAT 13L + BELT	95–94507 –00	1	6,08	16,312	99,18					
14	DOUBLE SEAT 1R + BELT	95–94064 –00	1	5,30	6,190	32,81					
15	DOUBLE SEAT 2R + BELT	95–94064 –00	1	5,30	7,104	37,65					
16	DOUBLE SEAT 3R + BELT	95–94064 –00	1	5,30	8,018	42,50					
17	DOUBLE SEAT 4R + BELT	95–94064 –00	1	5,30	8,933	47,34					

Version: VT01 Configuration: PARATROOP TRANSPORT												X: In aircraft when weighed O: Not in aircraft when weighed
Pos.	Item Description		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of Checking					
							1	2	3	4	5	
18	DOUBLE SEAT 5R + BELT	95–94064 –00	1	5,30	9,847	52,19						
19	SIMPLE SEAT 6R + BELT	95–94066 –00	1	3,10	10,533	32,65						
20	SIMPLE SEAT 7R + BELT	95–94066 –00	1	3,10	10,990	34,07						
21	DOUBLE SEAT 8R +BELT	95–94064 –00	1	5,30	11,676	61,88						
22	DOUBLE SEAT 9R + BELT	95–94064 –00	1	5,30	12,590	66,73						
23	DOUBLE SEAT 10R + BELT	95–94064 –00	1	5,30	13,505	71,58						
24	DOUBLE SEAT 11R + BELT	95–94064 –00	1	5,30	14,419	76,42						
25	DOUBLE SEAT 12R + BELT	95–94064 –00	1	5,30	15,334	81,27						
26	DOUBLE SEAT 13R + BELT	95–94507 –00	1	6,08	16,312	99,18						
27	VERTICAL STRUCTURE (STOWED)											
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
			1	5,30	19,891	105,42						
28	HORIZONTAL STRUCTURE (STOWED)											
			1	6,80	9,200	62,56						
			1	6,80	10,724	72,92						
			1	6,80	10,724	72,92						
			1	6,80	13,264	90,20						
			1	6,80	13,264	90,20						
			1	6,80	14,788	100,56						
			1	6,80	14,788	100,56						

Version: VT01 Configuration: PARATROOP TRANSPORT							X: In aircraft when weighed O: Not in aircraft when weighed				
Pos.	Item Description		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of Checking				
							1	2	3	4	5
29	AIR DELIVERY PLATFORM	95–91012 –00	2	15,37	16,312	250,72					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

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REPORTS
Basic Weight Checklist Sanitary Transport Configuration

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: MEDICAL EVACUATION**						**X: In aircraft when weighed** **O: Not in aircraft when weighed**						
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**
1	SANITARY SIMPLE SEAT		2	6,20	10,724	66,49					
2	STRETCHERS SUPPORT	AC760953	2	1,41	5,644	7,96					
			2	1,41	7,676	10,82					
			2	1,41	8,184	11,54					
			2	1,41	10,216	14,40					
			2	1,41	11,232	15,84					
			2	1,41	13,264	18,70					
			2	1,41	13,772	19,42					
			2	1,41	15,804	22,28					
3	RAIL STRETCHERS SUPPORT	AC760954	4	2,01	5,644	11,33					
			4	2,01	7,676	15,41					
			4	2,01	8,184	16,43					
			4	2,01	10,216	20,51					
			4	2,01	11,232	22,55					
			4	2,01	13,264	26,63					
			4	2,01	13,772	27,65					
			4	2,01	15,804	31,73					
4	RAIL STRETCHERS SUPPORT	95–94162–00	2	4,46	5,707	25,45					
		95–94165–00	2	4,00	7,676	30,70					
			2	4,00	8,184	32,74					
			2	4,00	10,216	40,86					
			2	4,00	11,232	44,93					
			2	4,00	13,264	53,06					
			2	4,00	13,772	53,09					
		95–94167–00	2	4,50	15,689	70,60					

Version: VT01 Configuration: MEDICAL EVACUATION						X: In aircraft when weighed O: Not in aircraft when weighed					
Pos.	Item Description		No. REQ	Total Weight (kg)	H-arm (m)	Moment (kg.m)	Record of Checking				
							1	2	3	4	5
5	STRETCHER	AC760734A	6	41,70	6,660	277,72					
			6	41,70	9,200	383,64					
			6	41,70	12,248	510,74					
			6	41,70	14,788	616,66					
6	DOUBLE SEAT + BELT		1	6,08	16,312	99,18					
			1	6,08	16,312	99,18					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

REPORTS
Basic Weight Checklist Cargo Transport Configuration

1 BASIC WEIGHT CHECKLIST - FORM A

Version: VT01 **Configuration: CARGO TRANSPORT**											**X: In aircraft when weighed** **O: Not in aircraft when weighed**
Pos.	**Item Description**		**No. REQ**	**Total Weight (kg)**	**H-arm (m)**	**Moment (kg.m)**	**Record of Checking**				
							1	**2**	**3**	**4**	**5**
1	RAILS METRIC SYSTEM										
	PALLET STOP	98600373-1	4	10,40	5,136	53,41					
	ROLLERS TRAY	98600262–1	4	10,40	5,898	61,34					
			4	10,40	7,342	76,36					
			4	10,40	8,866	92,21					
			4	10,40	10,390	108,06					
			4	10,40	11,914	123,91					
			4	10,40	13,438	139,76					
			4	10,40	14,962	155,60					
	ROLLERS TRAY	98600264-2	4	12,00	16,497	197,96					
	ROLLERS TRAY	98600264–1	4	12,00	17,866	214,39					
			4	12,00	19,338	232,06					
	STRAP ASSY	95–94130 –00	20	2,46	12,248	30,13					
	15K RING (STOWED)	AC711096	16	2,56	20,570	52,66					

Table 1 Basic Weight Checklist - Form A

RECORD OF CHECKING

1. Date:..... By:.....

2. Date:..... By:.....

3. Date:..... By:.....

4. Date:..... By:.....

5. Date:..... By:.....

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LIST OF EFFECTIVE PAGES

DMC	PAGES	DATE
CA-A-08-40-00-00O-000A-A	1 to 1	15/10/2014
CA-A-08-40-10-00A-000A-A	1 to 1	15/10/2014
CA-A-08-40-11-00A-000A-A	1 to 1	15/10/2014
CA-A-08-40-12-00A-000A-A	1 to 3	01/10/2020
CA-A-08-40-13-00A-000A-A	1 to 3	15/10/2014
CA-A-08-40-14-00A-000A-A	1 to 1	15/11/2017
CA-A-08-40-15-00A-000A-A	1 to 1	15/10/2014
CA-A-08-40-20-00O-000A-A	1 to 1	15/11/2017
CA-A-08-40-21-00A-000A-A	1 to 8	15/10/2014
CA-A-08-40-22-00O-000A-A	1 to 2	15/10/2014
CA-A-08-40-23-00O-000A-A	1 to 1	15/11/2017
CA-A-08-40-23-01O-000A-A	1 to 8	15/10/2018
CA-A-08-40-23-02O-000A-A	1 to 4	15/10/2018
CA-A-08-40-24-00O-000A-A	1 to 5	01/12/2019
CA-A-08-40-25-00A-000A-A	1 to 12	15/10/2018
CA-A-08-40-30-00O-000A-A	1 to 1	15/10/2014
CA-A-08-40-31-00O-000A-A	1 to 3	01/12/2019
CA-A-08-40-40-00O-000A-A	1 to 9	01/10/2020

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TABLE OF CONTENTS

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MASS AND CENTER OF GRAVITY
General Data

1 GENERAL

This section gives data about:
– Limitations (Refer to CA-A-08-40-10-00A-000A-A)
– Factors with influence to calculate the weight and find the center of gravity (Refer to CA-A-08-40-20-00O-000A-A)
– Loading System (Refer to CA-A-08-40-30-00O-000A-A)
– Centrogrammes (Refer to CA-A-08-40-40-00O-000A-A).

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MASS AND CENTER OF GRAVITY
Limitations

1 GENERAL

This section gives data about:
- Design Weight Limits (Refer to CA-A-08-40-11-00A-000A-A)
- Center of Gravity Limits (Refer to CA-A-08-40-12-00A-000A-A)
- Load Distribution Limitations (Refer to CA-A-08-40-13-00A-000A-A)
- Fuel System Limitations (Refer to CA-A-08-40-14-00A-000A-A)
- Jacking Weight Limitations (Refer to CA-A-08-40-15-00A-000A-A).

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LIMITATIONS
Design Weight Limits

1 DESIGN WEIGHT LIMITS

The following is a list and identification of all applicable weight limitations. The airplane is certified for operation at the following gross weight:

			CONDITION
TAXI (MTW)	Maximum Normal	21050 kg	
	Maximum Logistic	23250 kg	
TAKE-OFF (MTOW)	Maximum Normal	21000 kg	2,5 g
	Maximum Logistic	23200 kg	2,25 g
	Maximum Assault	17700 kg	3,0 g
ZERO FUEL (MZFW)	Maximum Normal	18500 kg	2,5 g
	Maximum Logistic	20700 kg	2,25 g
	Maximum Assault	16500 kg	3,0 g
LANDING	Maximum Normal	20700 kg	Vertical speed 10,00 ft/s
	Maximum Logistic	23200 kg	Vertical speed 9,00 ft/s

Maximum Fuel Capacity (6375 Kg) 7500 l.

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LIMITATIONS
Center of Gravity Limits

1 GENERAL

The center of gravity (CG) is defined by dimensions measured perpendicularly to the three basic datum planes. In usual circumstances only the longitudinal CG need be considered. The lateral CG must only be considered in very asymmetric loading configurations.

2 POSITION INDEX

The CG position index is the number representing the CG position in percent (%) of MAC. The CG position index is obtained by the formula:

CG position index (% MAC) = 100 · (B - G)/MAC

Where:

B = Average arm (Refer to CA-A-08-00-00-00A-006A-A)

G = LEMAC = 11,115 meters (Refer to CA-A-08-00-00-00A-006A-A)

3 MAXIMUM DESIGN LIMITS

The CG limits are the extreme positions of the CG displacement. The CG of the loaded aircraft must fall within these limits for take-off, flight and landing.

<table>
<tr><th rowspan="3">Weight (kg)</th><th colspan="4">CG Position Limits — % MAC</th></tr>
<tr><th colspan="3">Forward</th><th rowspan="2">Rear</th></tr>
<tr><th>Assault Role</th><th>Normal Operation</th><th>Logistic Operation</th></tr>
<tr><td>23200</td><td rowspan="5"></td><td></td><td>17,5</td><td rowspan="7">32,0</td></tr>
<tr><td>21000</td><td>15,7</td><td>16,2</td></tr>
<tr><td>20700</td><td>15,4</td><td>16,0</td></tr>
<tr><td>18500</td><td colspan="2" rowspan="2">13,5</td></tr>
<tr><td>17700</td><td>14,5</td></tr>
<tr><td>16500 thru 11140</td><td colspan="3">13,5</td></tr>
<tr><td>10800</td><td colspan="3">20,0</td><td>24,0</td></tr>
<tr><td colspan="5">NOTE: Limits between gross weights vary linearly with gross weight.</td></tr>
</table>

Table 1 Maximum forward and rear CG.

The effect of landing gear and/or flap operation on center of gravity location is negligible.

The limits of the Table 1 are with retracted landing gear. The extension causes a moment of 1,6 m.kg (139 in.lb) that makes that the aircraft nose rises.

Lateral loading is restricted only by the maximum permissible unsymmetrical fuel loading factor (Refer to CA-A-08-40-14-00A-000A-A).

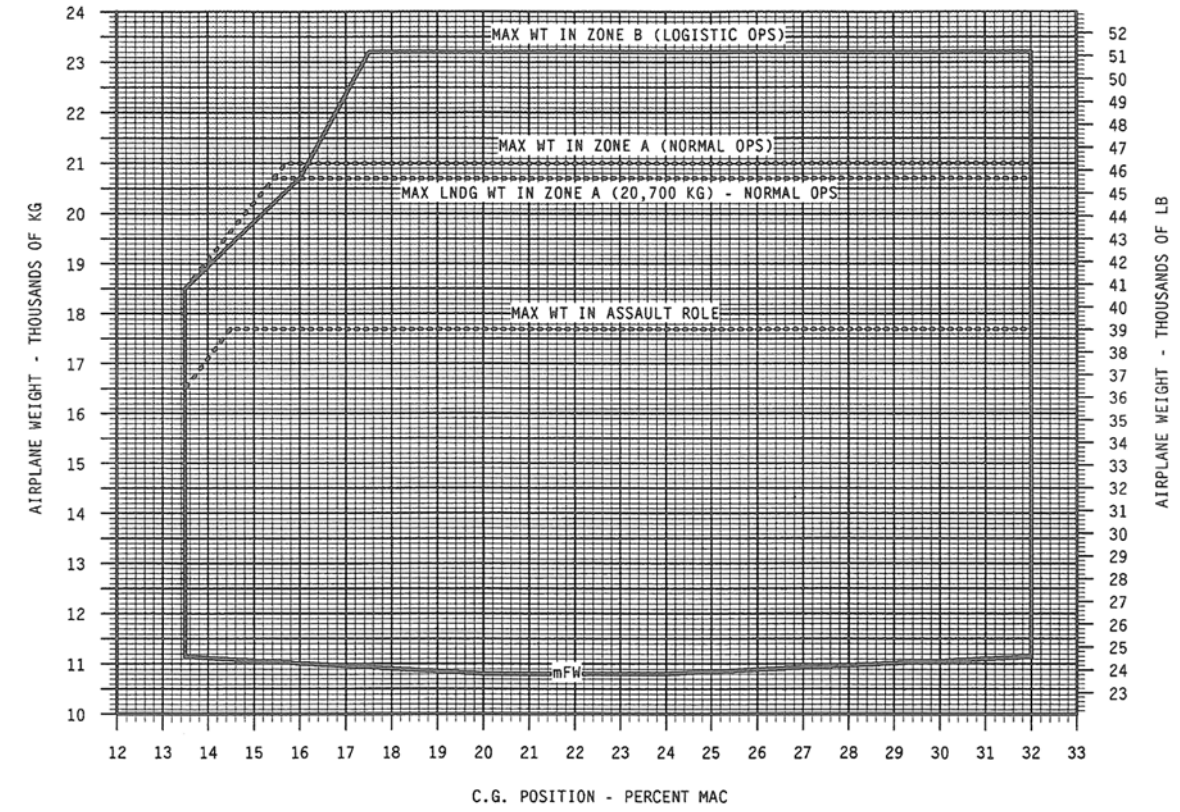
4 GRAPHIC OF AIRCRAFT CG

H-arm (m) = LEMAC + MAC . % MAC

H-arm (m) = 11,115 + 2,561. % MAC

Refer to the Figure 1.

CENTER OF GRAVITY LIMITATIONS DIAGRAM



CA-A-084012-07526-B02

ICN-CA-A-084012-I-0117B-07526-B-02-1

Figure 1 Weight Limits and Center of Gravity

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LIMITATIONS
Load Distribution Limitations

1 GENERAL

The floor loads are limited by any of these factors:
– Strength of the lower fuselage structure,
– Bending-resistance of the fuselage structure expressed in an integrated load.

A floor panel can be loaded up to its maximum permitted load with one, or more than one, load unit. When a floor panel receives the maximum permitted load, no other load can be added to it in the same panel. When a load unit has no a flat supporting surface, its maximum permitted weight is determined by the sum of these maximum permitted weights in each supporting section, which are in contact with the floor surface.

This data module gives the load distribution limits applicable on the floor in compliance with FAR 25.23.

Next the types of established limitations are shown.

2 ZONE LOADING LIMITS

The established zones are shown in the Figure 1 and the values in the Table 1 .

ZONE	MAXIMUM PERMITTED LOAD
1	2540 Kg (5600 lb)
2	3912 Kg (8625 lb)
3	1981 Kg (4368 lb)
4	2794 Kg (6160 lb)
5	1894 Kg (4176 lb)
RAMP	1000 Kg (2204 lb)

Table 1 Zone Loading Limits

Note: The lb-values above are rounded off to the nearest 10 lb.

3 FLOOR AREA LOADING LIMITS

OVER REINFORCED FLOOR AREAS	OVER NORMAL FLOOR AREAS	UNITS
3000	1600	Kg/m^2
279	148	Kg/ft^2
1,93	1,03	$Kg/sq.in^2$

Table 2 Limits of Area Loading on Floor

4 LINEAL FLOOR LOADING LIMITS

ZONES		LOADS
	kg/m	Lb/ft
STA 5136 (FR12) - STA 7676 (FR17)	1000	672
STA 7676 (FR17) - STA 11232 (FR21)	1100	738
STA 11232 (FR21) - STA 12756 (FR24)	1300	873
STA 12756 (FR24) - STA 15296 (FR26)	1100	738
STA 15296 (FR26) - STA 17190 (FR30)	1000	672
RAMP (closed) STA 17190 (FR30) - STA 19864 (FR38)	299	201

Table 3 Limits of Lineal Loading on Floor

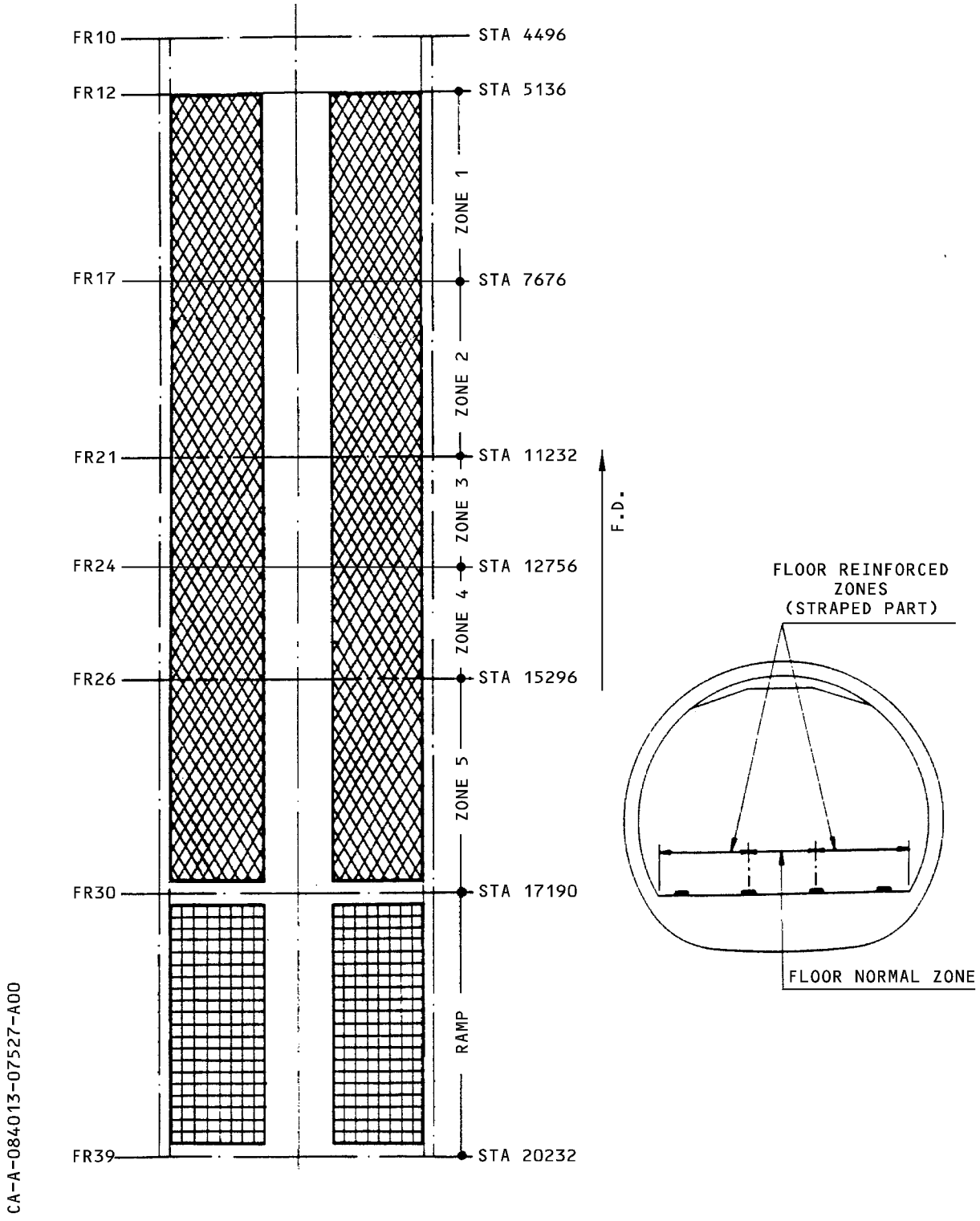

Figure 1 Loading Zones

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LIMITATIONS
Fuel Systems Limitations

1 FUEL SYSTEM LIMITATIONS

Maxim fuel asymmetry between tanks is:

AIRCRAFT WEIGHT	MAXIMUM FUEL ASYMMETRY BETWEEN	
	MAIN TANKS	AUXILIARY TANKS
less than 18000 kg (39690 lb)	270 kg (600 lb)	60 kg (135 lb) when the main tanks are in balance condition. Lineally reducing 23 kg (50 lb), up to zero, for each 100 kg (240 lb) of unbalance in main tanks.
more than 18000 kg (39690 lb)	(90 kg) 200 lb	20 kg (40 lb) when the main tanks are in balance condition. Otherwise, no perceptible asymmetry can exist.

Table 1 Fuel System Limitations

NOTE: The suitable weights are based on a fuel with a density of 0,85 kg/l (7,1 lb/US gal).

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LIMITATIONS
Jacking Weight Limitations

1 JACKING WEIGHT LIMITATIONS

The position of the center of gravity (CG) does not cause effect in the C-295M aircraft when the weight is less than 17000 kg.

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WEIGHT AND BALANCE
Factors with Influence

1 GENERAL

This section gives the primary factors with influence to calculate the weight and find the center of gravity position. These are:
- Fuel (Refer to CA-A-08-40-21-00A-000A-A)
- Fluids (Refer to CA-A-08-40-22-00O-000A-A)
- Persons in General (Refer to CA-A-08-40-23-00O-000A-A)
- Internal Distribution (Refer to CA-A-08-40-24-00O-000A-A)
- Loading (Refer to CA-A-08-40-25-00A-000A-A).

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WEIGHT AND BALANCE
Fuel

1 GENERAL

1.1 FUEL TANKS

Pieces of the wings are sealed to make fuel storage areas. Thus, they are four independently integral tanks (Figure 2):
– Two in the center wing assembly, between STA 0 and STA 3100
– One in each outer wing assembly, between STA 4250 and STA 10830.

The center wing tanks are the main tanks and they receive the fuel from the outer wing (auxiliary) tanks. Then, they send the fuel to the engines.

In usual operating conditions the fuel of the auxiliary tanks is transferred to the main tanks by jet pumps which are energized by tank booster pump delivery pressure. In an emergency, transfer can be effected by gravity feed through external piping, which is at 3 degrees dihedral due to the location of the auxiliary tanks relative to the main tanks.

The water drain valves are in the low points of each tank. The access panels on the bottom wing skin let the entry to the tank area for maintenance tasks. The inner part of the tanks has a protection layer to prevent the corrosion and growth of the microbiological organisms.

To get more data refer to CA-A-28-00-00-00A-040A-A .

1.2 CAPACITY

The auxiliary (outboard) tanks have a larger capacity than the main (inboard) tanks.

The storage capacity of the fuel tanks assembly is 7613,5 liters (2011,2 US gallons):
– The capacity of each main tank is 1695 liters (448 US gallons)
– The capacity of each auxiliary tank is 2117 liters (559 US gallons).

To get more data refer to CA-A-12-11-00-00A-040A-A .

1.3 FUEL DENSITY

All fuel weights shown in this manual are based on fuel density of 0,85 kg/l (7,1 lb/US gal, equivalent to 8.53 pounds per imperial gallon).

1.4 FUEL AVERAGE SPECIFIC WEIGHT VARIATION

The variation of the average specific weight of fuel with temperature is shown in the Figure 1.

1.5 FUEL DISTRIBUTION

It is required in all cases, including one engine operation, that the distribution of fuel in the tanks should not exceed the limits given in CA-A-08-40-14-00A-000A-A . The design zero fuel weight shall not be exceeded.

2 UNUSABLE FUEL

The unusable fuel is the fuel remaining after a fuel run out test has been completed as per FAR 25.959 requirements.

It includes drainable unusable fuel plus unusable portion of trapped fuel.

SITUATION	Volume (liters)	Weight (kg)	H-arm (m)	Moment (kg.m)
Main Tanks	45,0	38,3	12,225	468,2
Auxiliary Tanks	22,5	19,2	12,178	233,8
Pipes	33,0	28,0	10,994	307,8
Total	100,5	85,5	11,811	1009,8

Table 1 Unusable Fuel Data (without refuelling probe fitted)

UNUSABLE FUEL = DRAINABLE UNUSABLE FUEL + TRAPPED FUEL

3 DRAINABLE UNUSABLE FUEL

The drainable unusable fuel is the unusable fuel minus the unusable portion of the trapped fuel.

SITUATION	Volume (liters)	Weight (kg)	H-arm (m)	Moment (kg.m)
Main Tanks	33,0	28,0	12,252	343
Auxiliary Tanks	4,5	3,8	12,386	47
Total	37,5	31,8	12,262	390

Table 2 Drainable Unusable Fuel Data

4 TRAPPED FUEL

The trapped fuel is the fuel remaining when the aircraft is defueled in static ground attitude by the normal means and procedures specified for draining the tanks.

SITUATION	Volume (liters)	Weight (kg)	H-arm (m)	Moment (kg.m)
Main Tanks	12,0	10,2	12,232	124,7
Auxiliary Tanks	18,0	15,3	12,187	186,4
Pipes	33,0	28,0	10,994	307,8
Total	63,0	53,5	11,571	619,0

Table 3 Trapped Fuel Data

5 USABLE FUEL

The usable fuel is the fuel available for aircraft propulsion.

The Figure 3 shows, when know the total usable fuel on board, the usable fuel quantity in the main and auxiliary tanks respectively.

SITUATION	Volume (liters)	Weight (kg)	H-arm (m)	Moment (kg.m)
Main Tanks	3390	2881	11,943	34408
Auxiliary Tanks	4110	3494	12,058	42130
Total	7500	6375	12,006	76538

Table 4 Usable Fuel Data

FUEL TABLES					
Main Fuel Capacity: 3389 liters (895 US gal.) Fuel Density: 0,85 kg/l (7,1 lb/US gal.)					
Volume		Weight		H-arm	Moment
USA gallons	Liters	Pounds	kg	M	kg.m
14	53	100	45	12,220	560
28	106	200	91	12,192	1109
42	159	300	136	12,165	1654
56	212	400	181	12,139	2197
70	265	500	227	12,112	2749
85	322	600	272	12,098	3290
99	375	700	317	12,083	3830
113	428	800	363	12,068	4381
127	481	900	408	12,054	4918
141	534	1000	454	12,039	5466
156	590	1100	499	12,025	6000
169	640	1200	544	12,019	538
183	693	1300	590	12,013	7087
197	746	1400	635	12,007	7624
211	799	1500	680	12,001	8161
225	852	1600	726	11,994	8707
239	905	1700	771	11,988	9243
253	958	1800	816	11,985	9780
267	1011	1900	862	11,982	10328
282	1067	2000	907	11,979	10865
296	1120	2100	952	11,976	11401
310	1173	2200	998	11,973	11949
324	1226	2300	1043	11,971	12846
338	1279	2400	1088	11,968	13021
352	1332	2500	1134	11,967	13570
423	1601	3000	1361	11,959	16276

FUEL TABLES					
Main Fuel Capacity: 3389 liters (895 US gal.) Fuel Density: 0,85 kg/l (7,1 lb/US gal.)					
Volume		Weight		H-arm	Moment
USA gallons	Liters	Pounds	kg	M	kg.m
493	1866	3500	1587	11,954	18971
563	2131	4000	1814	11,951	21679
634	2400	4500	2041	11,949	24388
704	2665	5000	2268	11,947	27096
775	2933	5500	2494	11,946	29793
845	3198	6000	2721	11,944	32500
895	3390	6351	2881	11,943	34408

Table 5 USABLE FUEL LOAD AND INDEX – MAIN TANKS

FUEL TABLES					
Auxiliary Fuel Capacity: 4111 liters (1087 US gal.) Fuel Density: 0,85 kg/l (7,1 lb/US gal.)					
Volume		Weight		H-arm	Moment
USA gallons	Liters	Pounds	kg	M	kg.m
14	53	100	45	12,149	547
28	106	200	91	12,111	1102
42	159	300	136	12,090	1644
56	212	400	181	12,076	2186
70	265	500	227	12,062	2739
85	322	600	272	12,054	3279
99	375	700	317	12,050	3820
113	428	800	363	12,046	4373
127	481	900	408	12,041	4913
141	534	1000	454	12,038	5466
156	590	1100	499	12,036	6006
169	640	1200	544	12,035	6547
183	693	1300	590	12,033	7099
197	746	1400	635	12,032	7640
211	799	1500	680	12,031	8181
225	852	1600	726	12,030	8733
239	905	1700	771	12,030	9275
253	958	1800	816	12,029	9816

FUEL TABLES					
Auxiliary Fuel Capacity: 4111 liters (1087 US gal.) Fuel Density: 0,85 kg/l (7,1 lb/US gal.)					
Volume		Weight		H-arm	Moment
USA gallons	Liters	Pounds	kg	M	kg.m
267	1011	1900	862	12,029	10369
282	1067	2000	907	12,029	10910
296	1120	2100	952	12,028	11451
310	1273	2200	998	12,028	12004
324	1226	2300	1043	12,028	12545
338	1279	2400	1088	12,029	13086
352	1332	2500	1134	12,029	13641
423	1601	3000	1361	12,031	16374
493	1866	3500	1587	12,033	19096
563	2131	4000	1814	12,036	21833
634	2400	4500	2041	12,039	24571
704	2665	5000	2268	12,042	27311
775	2933	5500	2494	12,044	30037
845	3198	6000	2721	12,046	32777
915	3463	6500	2948	12,049	35520
986	3732	7000	3175	12,052	38265
1056	3997	7500	3401	12,056	41002
1087	4111	7702	3494	12,058	42131

Table 6 USABLE FUEL LOAD AND INDEX – AUXILIARY TANKS

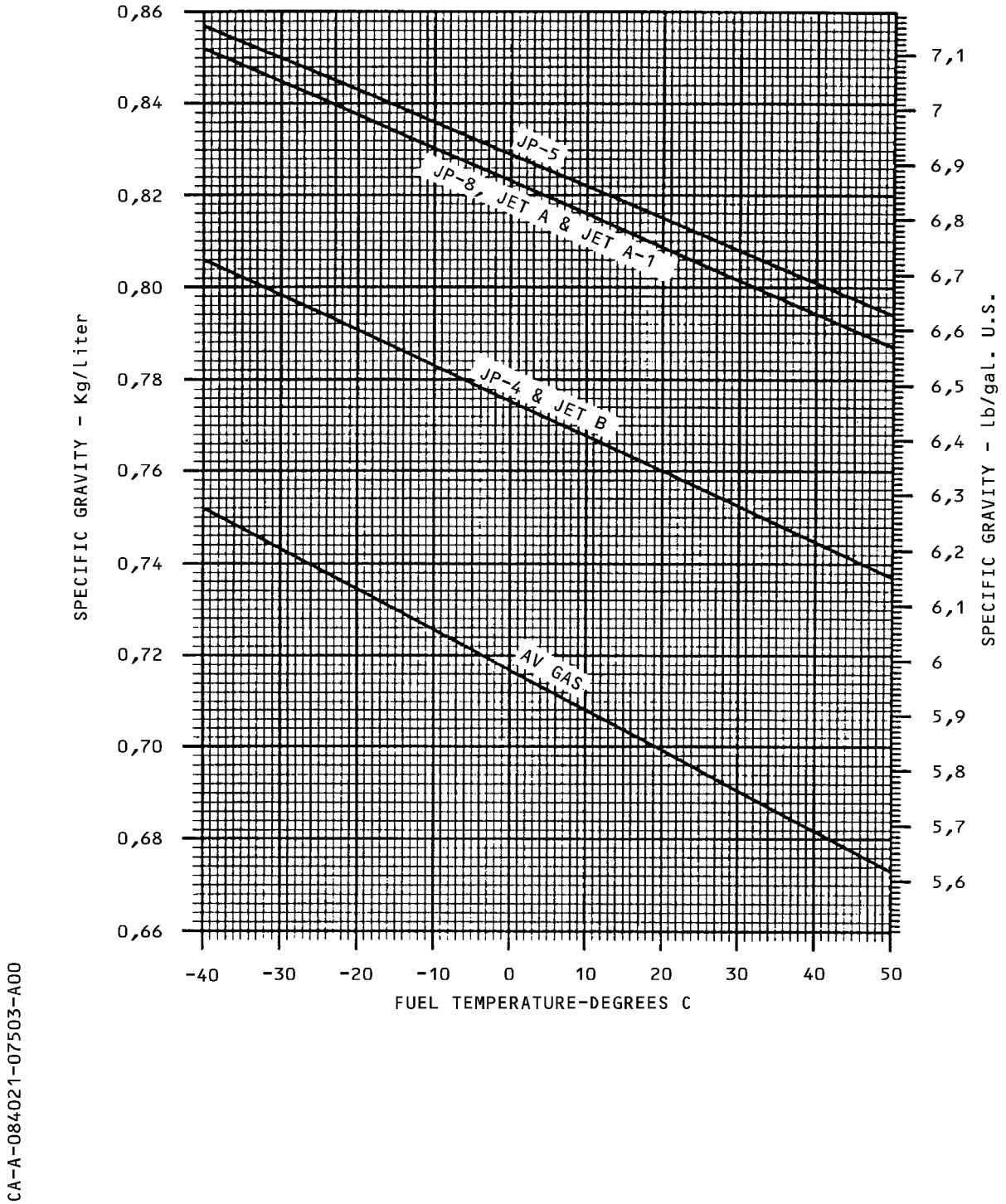

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Figure 1 Variation of the Average Specific Weight of Fuel with Temperature

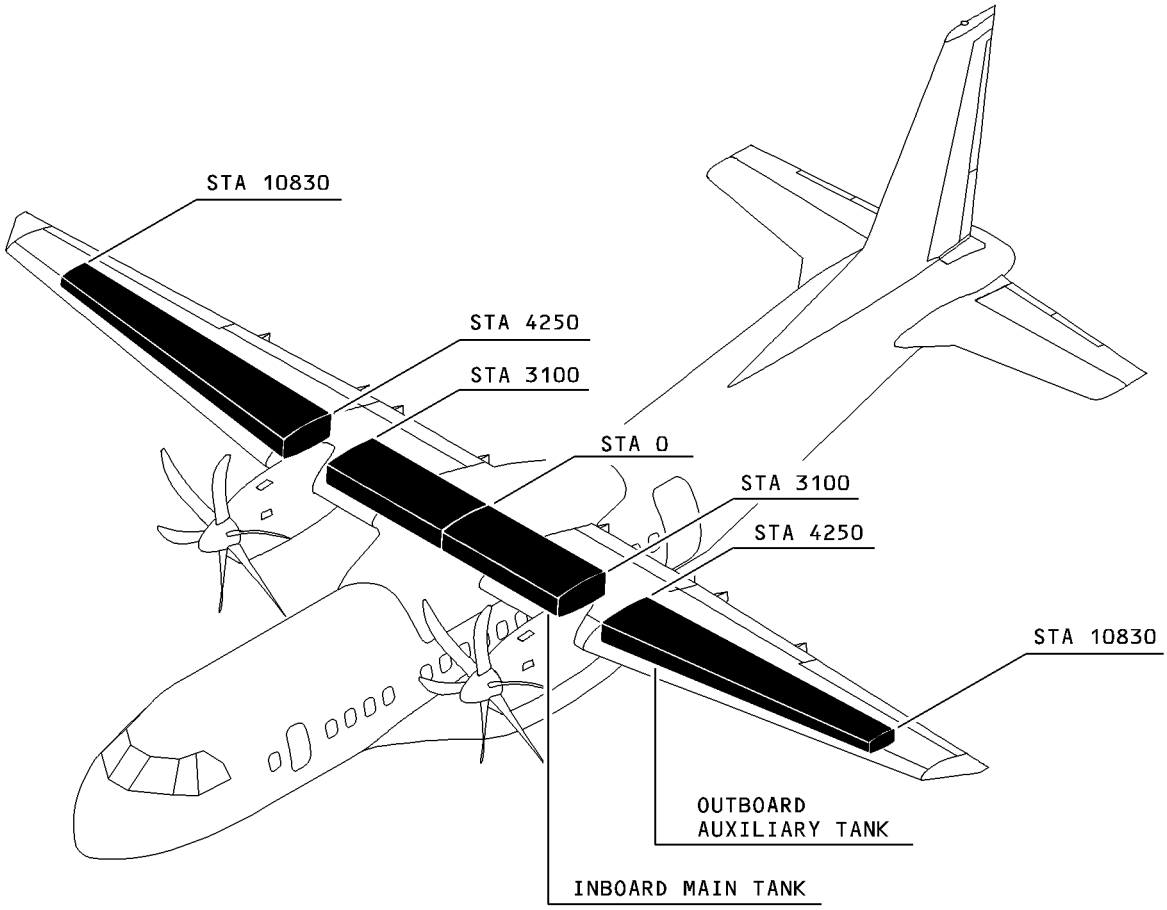

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Figure 2 Fuel Tanks Location

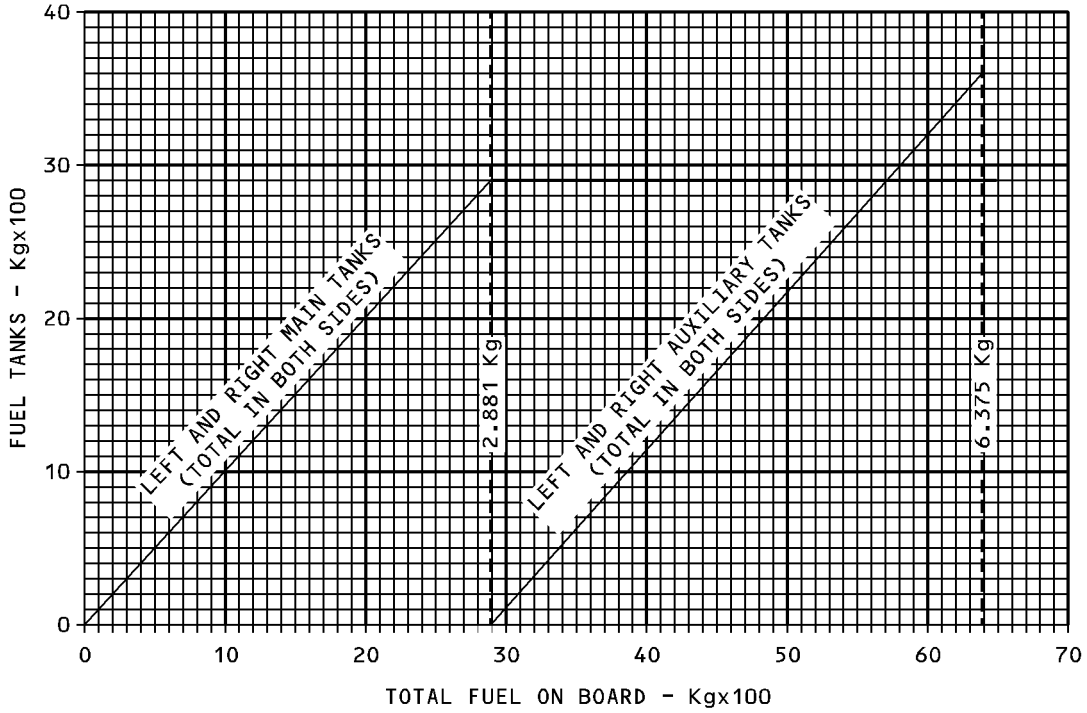

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Figure 3 Main and Auxiliary Tanks Usable Total Fuel on Board (Normal Loading and Usage Schedule)

WEIGHT AND BALANCE
Fluids

1 GENERAL

This section gives data about:
– Engine fluids
– Hydraulic system fluid
– Portable water
– Toilet chemicals.

2 ENGINE FLUIDS

2.1 OIL DENSITY

All oil weights shown in this manual are based on an oil density of 0,92 kg/liter (7,74 lb/US gal.)

2.2 LUBRICATION SYSTEM

Each engine has a built-in oil reservoir. Each propeller gear case (PGC) has a self-contained oil reservoir.

2.3 OIL CONSUMPTION

The C295 balance variation for oil consumption is negligible because of the very low oil consumption rate for the turboprop engines (maximum consumption 0,5 lb/h/engine).

NOTE

The difference between the inspection level marks "MIN" and "TOPUP" of each oil tank is 3,5 liters (0,92 US gal.).

ITEM	VOLUME (liters)	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
TOTAL USABLE OIL				
Engine (2) and PGC (2)	14,54	14,18	10,359	146
Total	14,54	14,18	10,359	146

Table 1 Usable engine and propeller gear case lubricating oil

ITEM	VOLUME (liters)	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
TOTAL OIL				
Engine (2) and PGC (2)	46,05	44,91	10,455	469
Total	46,05	44,91	10,455	469

Table 2 Total usable and unusable engine and propeller gear case lubricatingoil

3 HYDRAULIC FLUID

The hydraulic fluid weight shown in this manual are based on a density of 0,92 kg/l (7,64 lb/US gal.).

NOTE

The difference between the inspection level marks “REFILL” and “FULL” of the hydraulic fluid is 1,8 liters (1,9 US qts.).

SITUATION	VOLUME (liters)	WEIGHT (kg)	H-ARM (m)	Moment (kg.m)
Hydraulic system	24,34	22,28	13,004	290

Table 3 Hydraulic Fluid Loading Data

4 WATER/PORTABLE LIQUIDS

SITUATION	VOLUME (liters)	WEIGHT (kg)	H-ARM (m)	Moment (kg.m)
Emergency Rack (Hot Cup)	2	2	4,644	9,28
Emergency Rack (Oven)	4	4	4,644	18,57

Table 4 Portable Liquids Data

5 TOILET CHEMICALS

SITUATION	VOLUME (liters)	WEIGHT (kg)	H-ARM (m)	Moment (kg.m)
Toilet	11,35	11,35	4,862	55,2

Table 5 Toilet chemicals loading data

WEIGHT AND BALANCE
Persons in General

1 GENERAL

This section of the Weight and Balance Manual gives detailed data about passengers and crew members arrangement as well as weight and balance effects of passengers and crew.

1.1 CONFIGURATIONS

The configurations are:

– Troop Transport/Paratroop Air Drop Configurations (70/49 passenger seats) (Refer to CA-A-08-40-23-01O-000A-A)
– MEDEVAC Configurations (24 stretchers and 6 medical attendant seats) (Refer to CA-A-08-40-23-02O-000A-A)
– Cargo Transport/Air Drop Load Configurations (Refer to CA-A-08-40-25-00A-000A-A).

1.2 IN-FLIGHT MOVEMENTS

A safety margin to allow personnel in-flight movements must be placed within the certificated center of gravity limits. This margin must be defined with reasonable movement of crew, service trolleys and passengers to the toilets, galleys and others areas from their places.

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WEIGHT AND BALANCE
Personnel General

1 GENERAL

This section of the Weight and Balance Manual gives detailed data about passengers and crew members arrangement as well as weight and balance effects of passengers and crew in Troop Transport Configuration and in Paratroop Air Drop Configuration.

2 FLIGHT CREW ARRANGEMENT

The Table 1 and Figure 1 show the moments and distribution of the flight crew.

CREW	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
PILOT	70	3,549	248
	75		266
	80		283
	85		301
	90		319
COPILOT	70	3,549	248
	75		266
	80		283
	85		301
	90		319
THIRD MEMBER	70	4,336	304
	75		325
	80		347
	85		369
	90		390
LOADMASTER	70	4,824	338
	75		362
	80		386
	85		410
	90		434

Table 1 Flight Crew Load and Index Data

3 TROOPS/PARACHUTIST ARRANGEMENT

3.1 GENERAL

The passenger compartment has a configuration of 66 seats arranged in three rows, and one of them in the emergency wardrobe. It is possible install two double seats, one to each side of the passenger compartment and installed in the rear area door, that suppose a total of 70 passengers (Figure 2):
– On the RH row: 24 seats

– On the LH row: 25 seats
– On the center row: 21 seats.

3.2 TABLE OF MOMENTS

3.2.170 Seats Configuration

The weight established for each passenger is 85 kg, 80 kg is considered as the weight of one passenger and applied to each seat. The remaining 5 kg corresponding to passenger baggage is applied to the ramp door (Table 2).

SEAT	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
1 L	85	5,494	467,0
2 L	85	5,993	509,4
3 L	85	6,387	542,9
4 L	85	6,907	587,1
5 L	85	7,301	620,6
6 L	85	7,821	664,8
7 L	85	8,215	698,3
8 L	85	8,736	742,6
9 L	85	9,130	776,1
10 L	85	9,650	820,3
11 L	85	10,044	853,7
12 L	85	10,565	898,0
13 L	85	10,959	931,5
14 L	85	11,480	975,8
15 L	85	11,874	1009,3
16 L	85	12,393	1053,4
17 L	85	12,787	1086,9
18 L	85	13,308	1131,2
19 L	85	13,702	1164,7
20 L	85	14,222	1208,9
21 L	85	14,616	1242,4
22 L	85	15,137	1286,6
23 L	85	15,531	1320,1
24 L	85	16,115	1369,8
25 L	85	16,509	1403,3
1 R	85	5,993	509,4
2 R	85	6,387	542,9
3 R	85	6,907	587,1

SEAT	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
4 R	85	7,301	620,6
5 R	85	7,821	664.8
6 R	85	8,215	698,3
7 R	85	8,736	742,6
8 R	85	9,130	776,1
9 R	85	9,650	820,3
10 R	85	10,044	853,7
11 R	85	10,533	895,3
12 R	85	10,991	934,2
13 R	85	11,480	975,8
14 R	85	11,874	1009,3
15 R	85	12,393	1053,4
16 R	85	12,787	1086,9
17 R	85	13,307	1131,2
18 R	85	13,702	1164,7
19 R	85	14,222	1208,9
20 R	85	14,616	1242,4
21 R	85	15,137	1286,6
22 R	85	15,531	1320,1
23 R	85	16,115	1369,8
24 R	85	16,509	1403,3
1 C	85	5,891	500,7
2 C	85	6,285	534,2
3 C	85	6,744	573,2
4 C	85	7,364	625,9
5 C	85	7,758	659,4
6 C	85	8,247	701,0
7 C	85	8,837	751,1
8 C	85	9,231	784,6
9 C	85	9,720	826,2
10 C	85	10,311	876,4
11 C	85	10,705	909,9
12 C	85	11,193	951,4
13 C	85	11,784	1001,6
14 C	85	12,178	1035,1

SEAT	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
15 C	85	12,667	1076,7
16 C	85	13,257	1126,8
17 C	85	13,651	1160,3
18 C	85	14,140	1201,9
19 C	85	14,730	1252,1
20 C	85	15,124	1285,5
21C	85	15,613	1327,1
TOTAL	5950	10,996	65423,5

Table 2 Weight and Balance of each Parachutist

3.2.249 Seats Configuration

In the case of equipped troop, the seats arrangement is as follows:
– On the left row: 25 passengers
– On the right row: 24 passengers
– The center row: Removed.

The weight corresponding to each passenger is 120 kg and applied to the passenger seat situation (Table 3).

SEAT	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
1 L	120	5,494	659,3
2 L	120	5,993	719,2
3 L	120	6,387	766,4
4 L	120	6,907	828,8
5 L	120	7,301	876,1
6 L	120	7,821	938,5
7 L	120	8,215	985,8
8 L	120	8,736	1048,3
9 L	120	9,130	1095,6
10 L	120	9,650	1158,0
11 L	120	10,044	1205,3
12 L	120	10,565	1267,8
13 L	120	10,959	1315,1
14 L	120	11,480	1377,6
15 L	120	11,959	1424,9
16 L	120	12,393	1487.2
17 L	120	12,787	1534,4

SEAT	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
18 L	120	13,308	1597,0
19 L	120	13,702	1644,2
20 L	120	14,22	1706,6
21 L	120	14,616	1753,9
22 L	120	15,137	1816,4
23 L	120	15,531	1863,7
24 L	120	16,115	1933,8
25 L	120	16,509	1981,1
1 R	120	6.222	746,6
2 R	120	6,616	793,9
3 R	120	6,907	828,8
4 R	120	7,301	876,1
5 R	120	7,821	938,5
6 R	120	8,215	985,8
7 R	120	8,736	1048,3
8 R	120	9,130	1095,6
9 R	120	9,650	1158,0
10 R	120	10,044	1205,3
11 R	120	10,533	1264,0
12 R	120	10,991	1318,9
13 R	120	11,480	1377,6
14 R	120	11,874	1424,9
15 R	120	12,393	1487,2
16 R	120	12,787	1534,4
17 R	120	13,308	1597,0
18 R	120	13,702	1644,2
19 R	120	14,222	1706,6
20 R	120	14,616	1753,9
21 R	120	15,137	1816,4
22 R	120	15,531	1863,7
23 R	120	16,115	1933,8
24 R	120	16,509	1981,1
TOTAL	5880	11,118	65376,1

Table 3 Weight and Balance of each Parachutist

3.3 IN-FLIGHT MOVEMENT

A safety margin to let personnel in-flight movements must be placed within the certified center of gravity limits.

This margin must be defined with reasonable movement of crew, service trolleys and passengers to the toilets, galleys and other areas from their places.

In this case the forward or aft in-flight movement allowance, for any items, is the summation of the individual in-flight movements, which is determined by entering the appropriate data in the following equations.

$I_f = \Sigma II_f$

With:

$II_f = W (H\text{-}arm_2 - H\text{-}arm_1)$

Where:

I_f = Total in-flight movement

II_f = Individual in-flight movement

W = Weight of item moving

$H\text{-}arm_1$ = H-arm of item before movement

$H\text{-}arm_2$ = H-arm of item after movement

For example: the movement of one passenger going from seat 11L to the forward right wardrobe.

W = 85 kg

Seat 11L = 10,044m

Forward right wardrobe = 4,644 m

$II_f = 85 (4{,}644 - 10{,}044) = -469$ kg.m

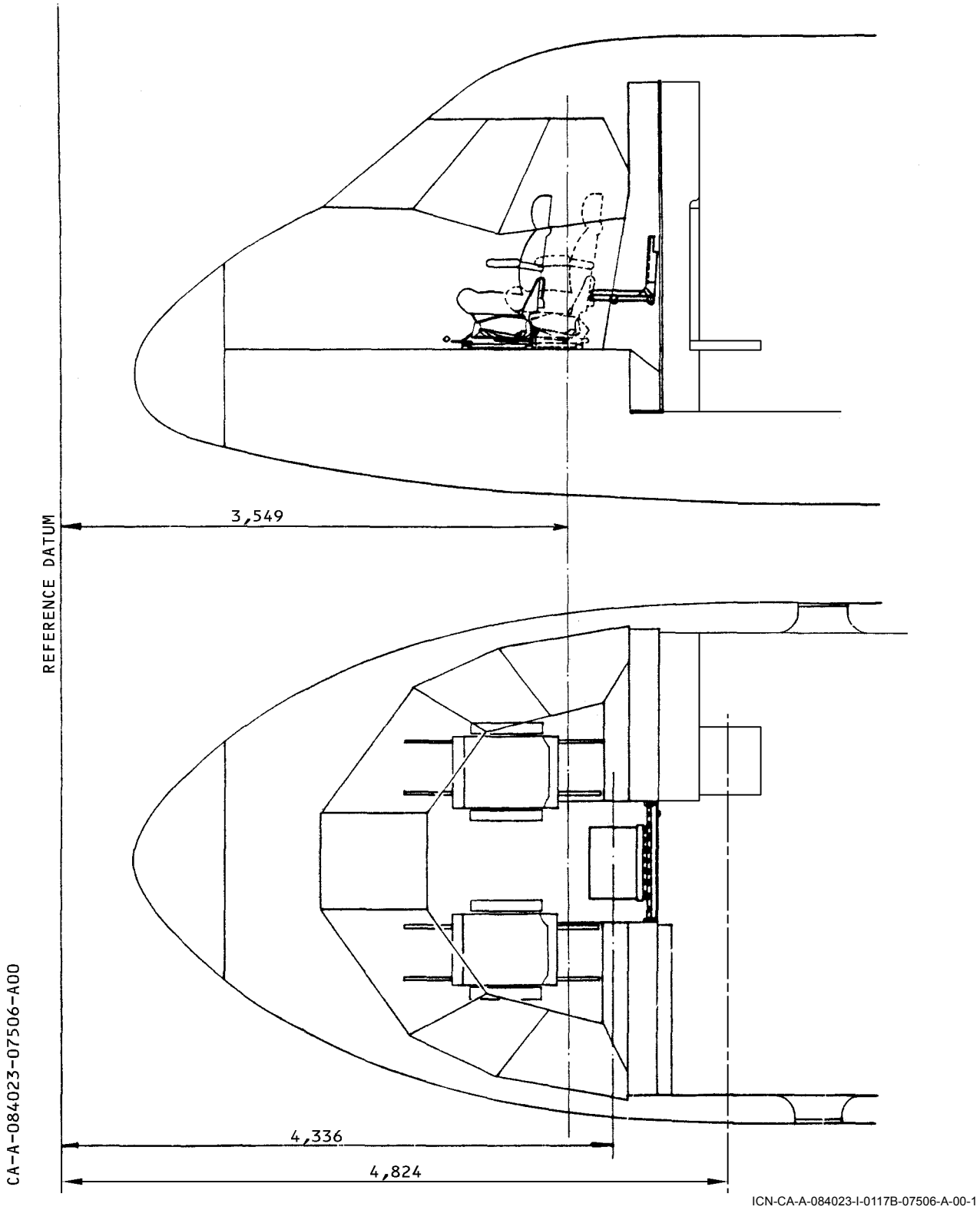
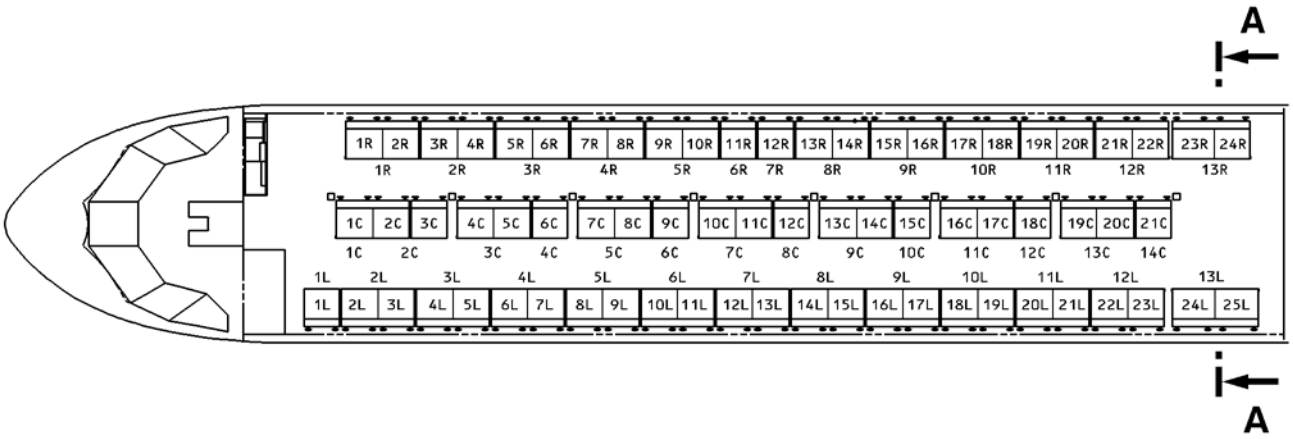
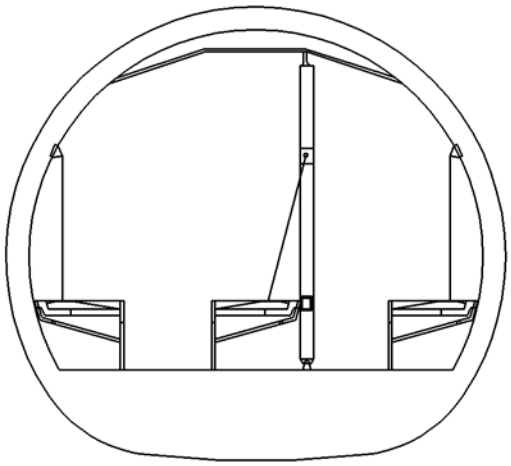


Figure 1 Flight Crew Arrangement





SECTION **A - A**
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Figure 2 Parachutist Arrangement

WEIGHT AND BALANCE
Persons in General - MEDEVAC Configuration

1 GENERAL

This section of the Weight and Balance Manual gives detailed data about passengers and crew members arrangement as well as weight and balance effects of passengers and crew in MEDEVAC configuration.

2 FLIGHT CREW ARRANGEMENT

The Table 1 and Figure 1 show the moments and distribution of the flight crew.

CREW	WEIGHT (kg)	H-arm (m)	Moment (kg.m)
PILOT	70 75 80 85 90	3.549	248 266 283 301 319
COPILOT	70 75 80 85 90	3.549	248 266 283 301 319
THIRD MEMBER	70 75 80 85 90	4.336	304 325 347 369 390
LOADMASTER	70 75 80 85 90	4.824	338 362 386 410 434

Table 1 Flight Crew Load and Index Data

3 MEDEVAC CONFIGURATION ARRANGEMENT

The passenger compartment in MEDEVAC configuration has 24 stretchers and 6 medical attendant seats (Refer to Table 2 and Figure 2).

POSITION	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
Seat A	85	13,026	1107,2
Seat B	85	13,026	1107,2
Seat C	85	16,115	1369,8
Seat D	85	16,115	1369,8
Seat E	85	16,509	1403,3
Seat F	85	16,509	1403,3

POSITION	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
Stretcher 1	85	6,660	566,1
Stretcher 2	85	6,660	566,1
Stretcher 3	85	6,660	566,1
Stretcher 13	85	6,660	566,1
Stretcher 14	85	6,660	566,1
Stretcher 15	85	6,660	566,1
Stretcher 4	85	9,200	782,0
Stretcher 5	85	9,200	782,0
Stretcher 6	85	9,200	782,0
Stretcher 16	85	9,200	782,0
Stretcher 17	85	9,200	782,0
Stretcher 18	85	9,200	782,0
Stretcher 7	85	12,248	1041,1
Stretcher 8	85	12,248	1041,1
Stretcher 9	85	12,248	1041,1
Stretcher 19	85	12,248	1041,1
Stretcher 20	85	12,248	1041,1
Stretcher 21	85	12,248	1041,1
Stretcher 10	85	14,788	1257,0
Stretcher 11	85	14,788	1257,0
Stretcher 12	85	14,788	1257,0
Stretcher 22	85	14,788	1257,0
Stretcher 23	85	14,788	1257,0
Stretcher 24	85	14,788	1257,0

Table 2 MEDEVAC configuration (stretchers only) – Table of moments

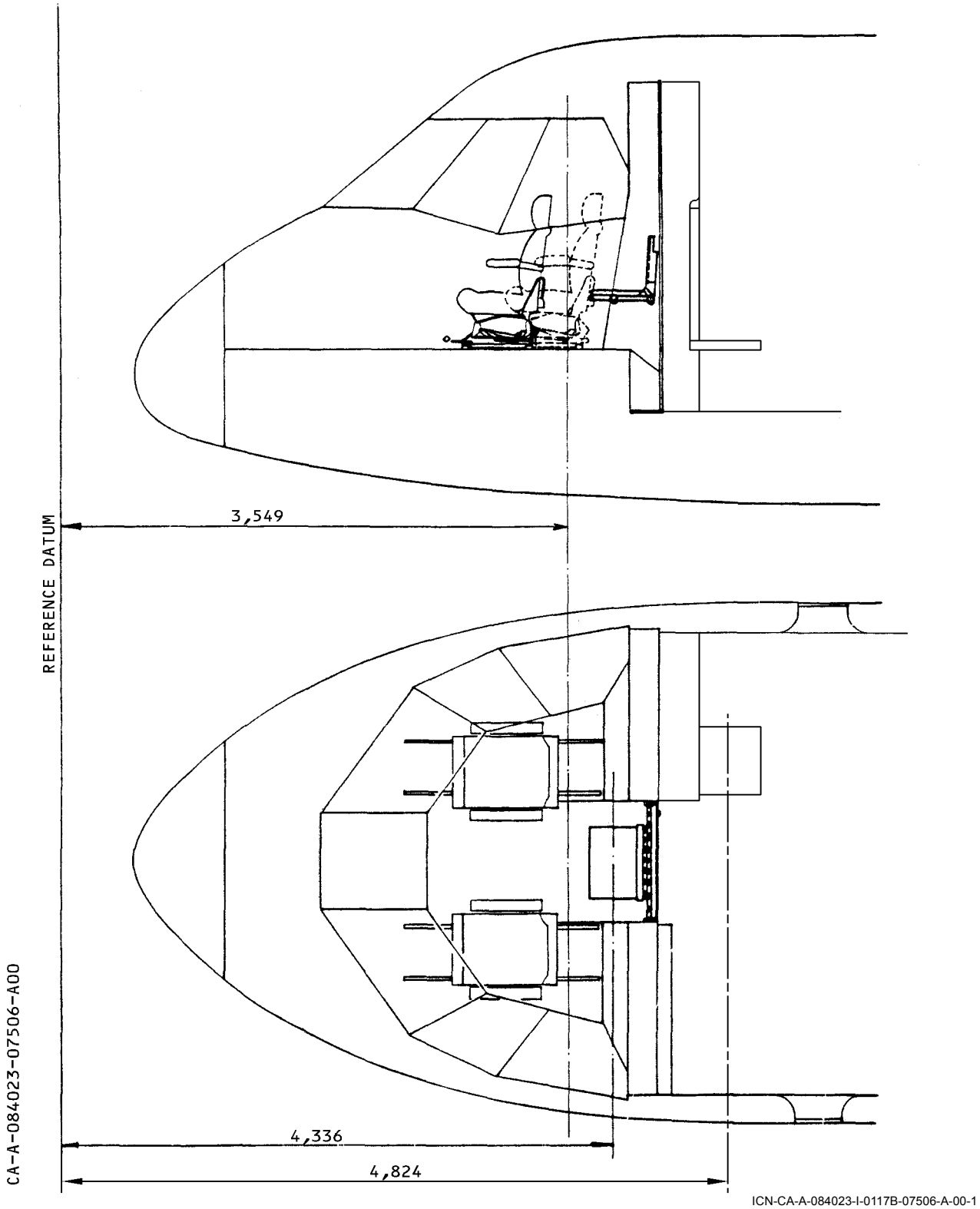

Figure 1 Flight Crew Arrangement

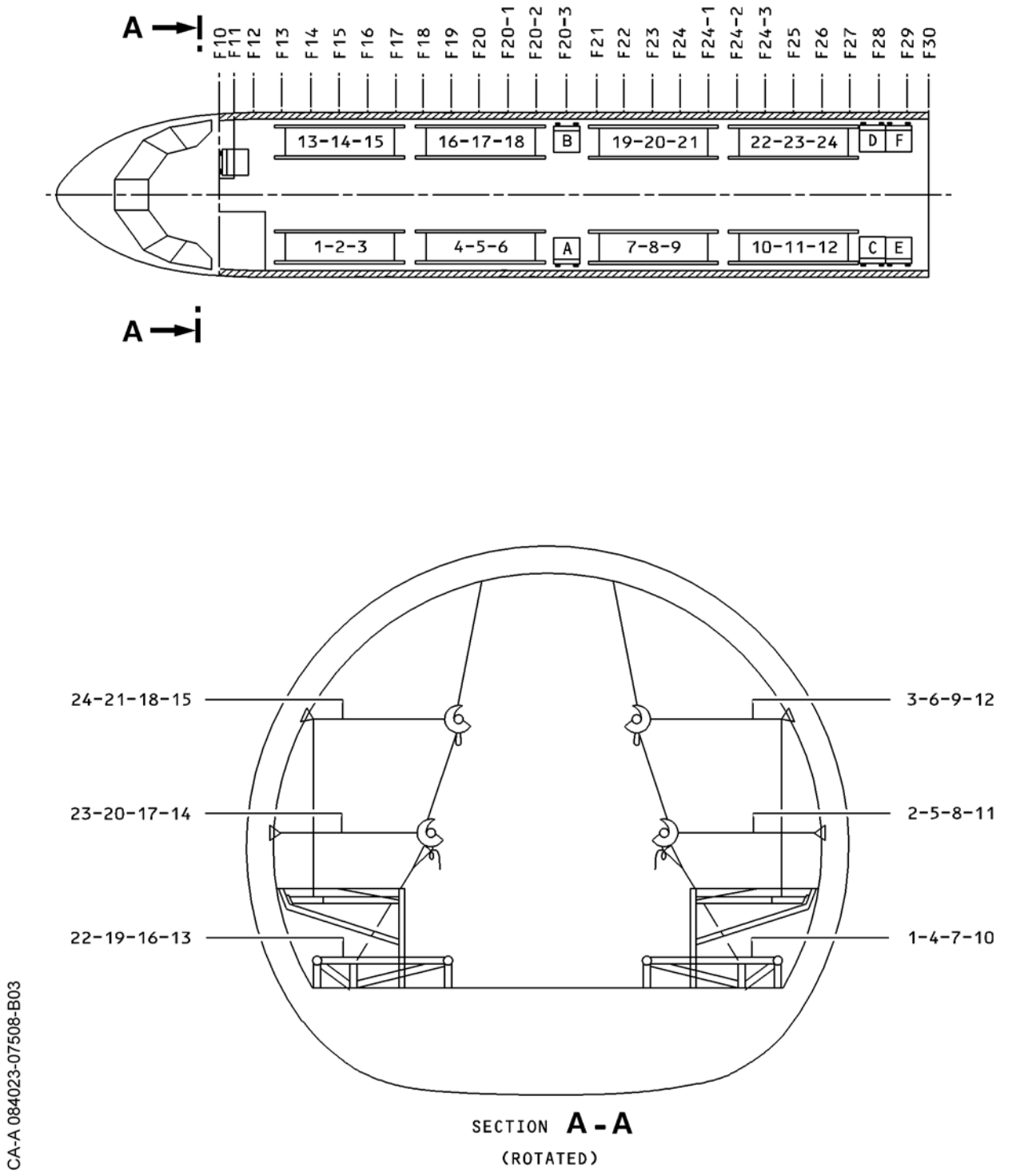

Figure 2 MEDEVAC configuration arrangement

WEIGHT AND BALANCE
Interior arrangement

1 GENERAL

This section describes the different stowage capacities in the flight and cabin compartments, emergency rack, toilet and rear fuselage.

2 FLIGHT COMPARTMENT STOWAGE

The Figure 1 shows the general arrangement of the flight compartment.

2.1 DOCUMENTATION STOWAGE

SITUATION	WEIGHT (kg)	H-ARM (m)	Moment (kg.m)
LEFT (Pilot) RIGHT (Copilot)	1,0 1,0	3,705 3,705	3,7 3,7

Table 1 Maximum Weights

2.2 CREW BAGGAGE STOWAGE

SITUATION	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
PILOT COPILOT	13,6 13,6	4,068	55,3 55,3

Table 2 Maximum Weights

LOAD (kg)	H-ARM (m)	MOMENT (kg.m)
2 4 8 10 14 15	4,068	8,1 16,2 32,5 40,6 56,9 61,0

Table 3 Load Variations

3 EMERGENCY RACK

The Figure 2 shows the emergency rack located in the passenger compartment.

NOTE

Load does not include emergency rack structure.

POSITION	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
EMERGENCY RACK	181,3	4,644	842

Table 4 Maximum Load

COMP.	OBSERVATIONS	WEIGHT (kg)	H-ARM (m)	MOMENT (kg.m)
1	Portable PC	6,5	4,644	30,2
2	Hot Cup / Oven	10,0	4,644	46,4
3	Various	5,0	4,644	23,2
4	First Aid	0,5	4,644	2,3
5	Various	10,0	4,644	46,4
6	Various	5,0	4,644	23,2
7	Various	15,0	4,644	69,7
8	Various	10,0	4,644	46,4
9	Oxyg. + Mask	10,0	4,644	46,4
10	Seat	96,0	4,644	445,8
11	Security Box	13,3	4,644	61,8

Table 5 Maximum Load of Emergency Rack Compartments.

4 TOILET STOWAGE

Refer to CA-A-25-41-00-00A-040A-A to find the arrangement of the toilet in the cabin.

5 FUSELAGE STOWAGE - GENERAL

The Figure 3 shows the arrangement of rear fuselage stowage.

POSITION	ITEM
1	Transversal rod door stowage
2	Jack load
3	Ramp cover
4	Transversal rod ramp stowage
5	Stowage bag
6	Central seat support stowage
7	Passageway (horizontal)

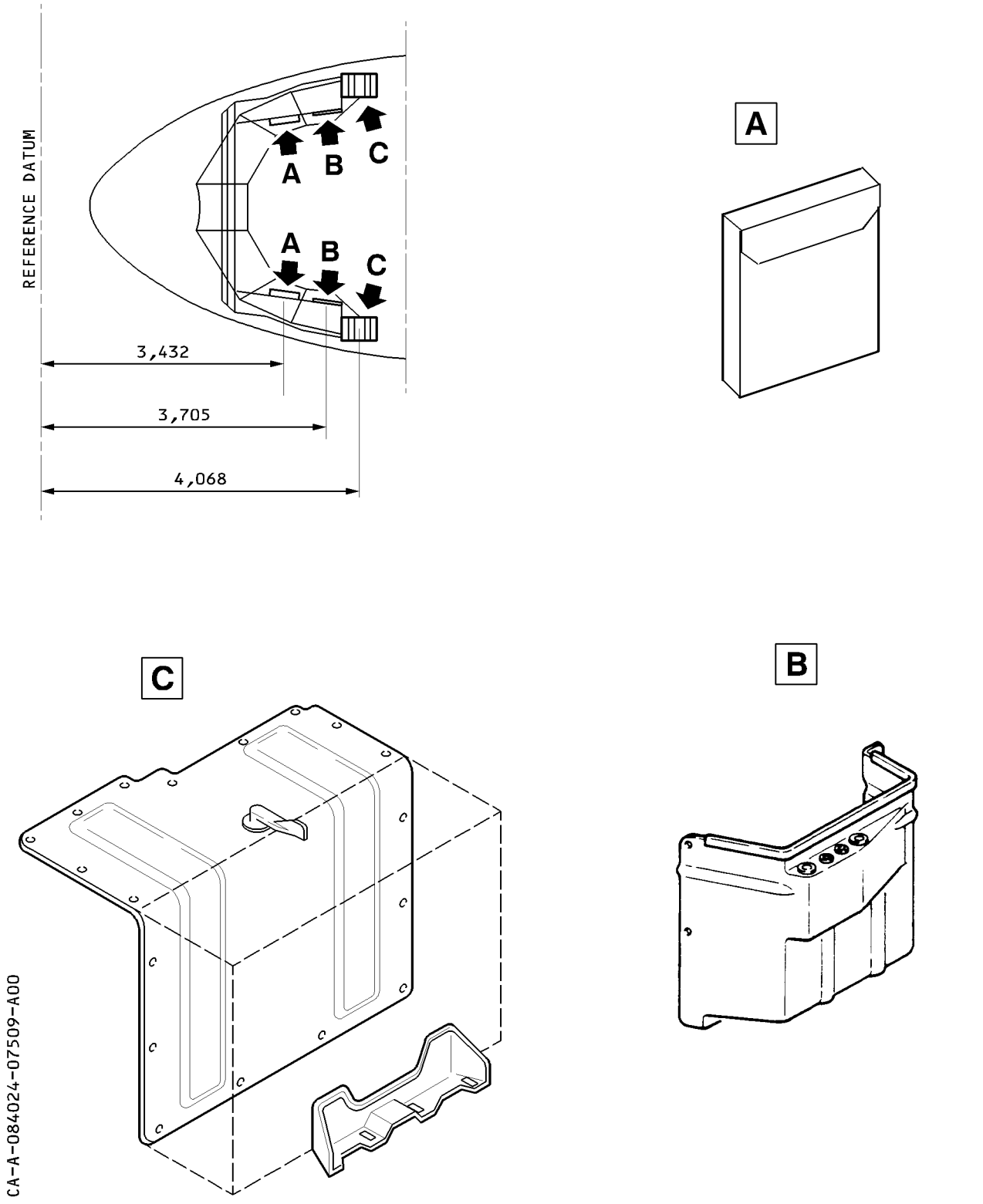

Figure 1 Documentation Stowage

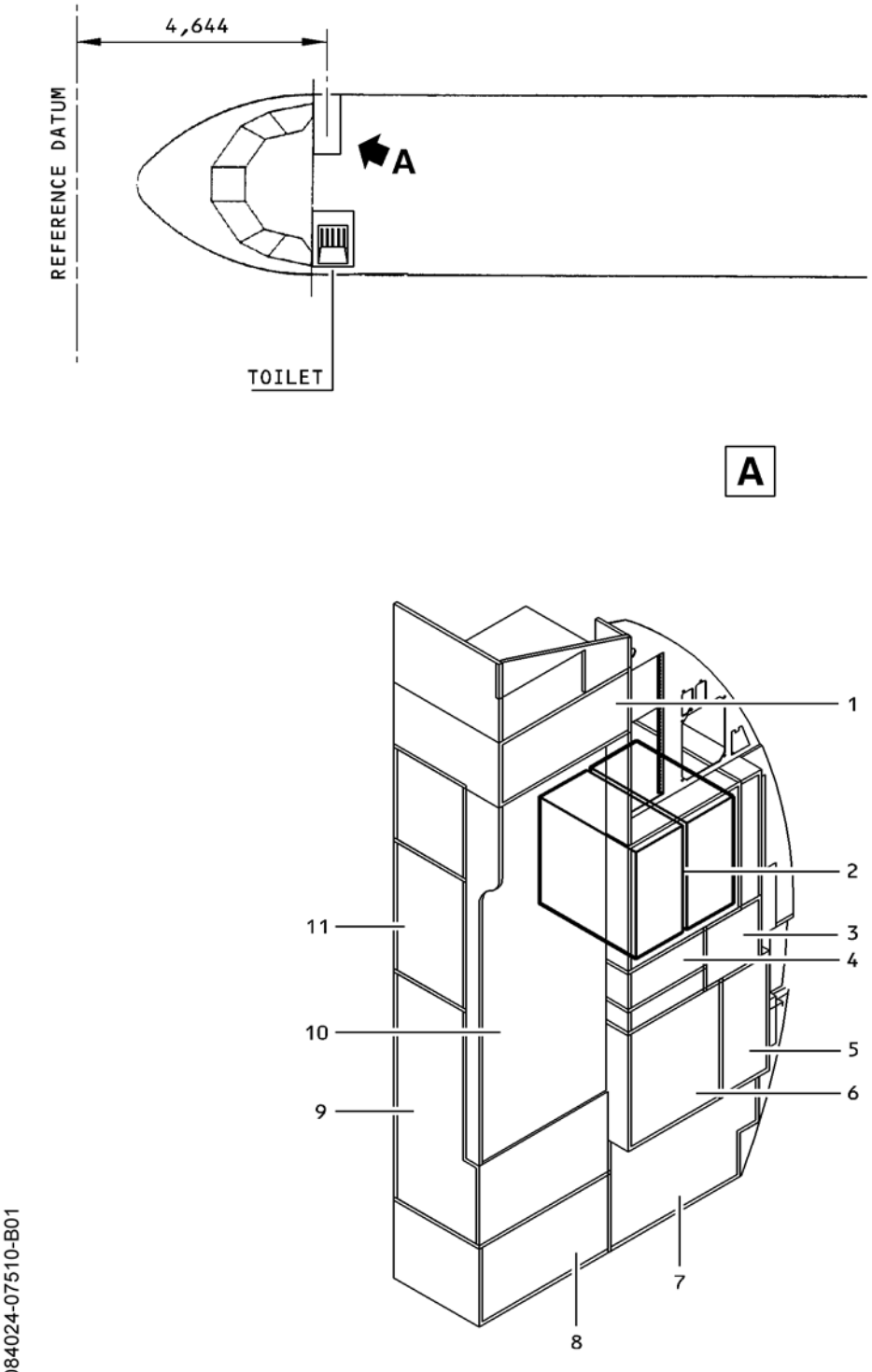

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Figure 2 Stowage Area in the Main Compartment

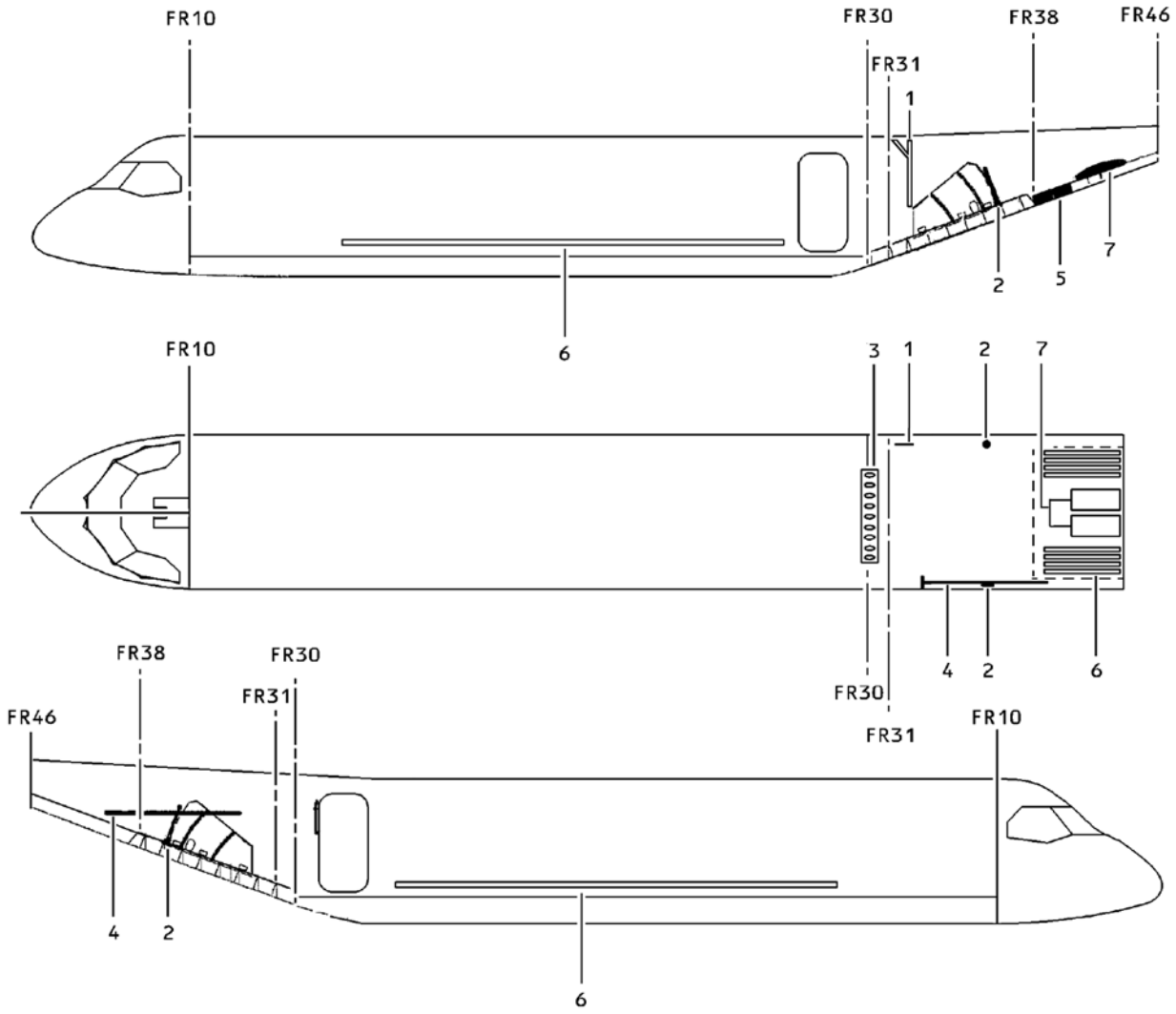

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Figure 3 Fuselage Stowage - General

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WEIGHT AND BALANCE
Cargo Transport/Air Drop Load Configurations

1 GENERAL

This section includes data about the load zones limitations in the C-295 aircraft.

2 CARGO CONFIGURATIONS

In the cargo configuration, the passengers compartment can also be used as a cargo compartment. The access to the compartment is through the hydraulically operated ramp door, or through the normal entry doors. The Figure 1 and Figure 2 give necessary the dimensions to get access and to load the aircraft.

There are different possibilities for loading. The main compartment as a combination of the different configurations explained hereinafter. Also, the configuration components can be located in different positions.

In case of loads on platforms, the center of gravity of loads perhaps is not coincident with the center point of the platform. In this case, it is necessary to calculate the new center of gravity for every particular case.

3 CARGO SYSTEM WITH WINCH

In the cargo configuration, the aircraft has a cargo dragging system by means of an electrical winch. Cargo can be moved over a roller guides system prepared lengthways of the aircraft, included the ramp door (Refer to CA-A-25-52-00-00A-040A-A).

4 AIR DELIVERY CARGO SYSTEM

The aircraft C-295, with the air delivery system (ADS) installed, is capable for air delivering loads on platforms (Refer to CA-A-25-91-00-00A-040A-A).

The air delivery system (ADS) is used to withdraw the platforms from the cargo compartment through the ramp door, which should be previously set to horizontal open position (See Figure 3).

5 TRANSPORT OF LOAD

To facility load and balance, the main compartment is divided in five zones (zones I thru V) and ramp (zone VI) (See Figure 4).

Each zone has a load limitation (Refer to CA-A-08-40-13-00A-000A-A). The values of weights and moments for each zone are shown in the Table 1 and Table 2 .

CARGO CONFIGURATION – TABLE OF MOMENT					
ZONE	I	II	III	IV	V
ARM (m)	6,406	9,454	11,994	14,026	16,243
CARGO (kg)	MOMENTS (kg.m)				
50	320	472	599	701	812
100 150	640 961	945 1418	1199 1799	1402 2104	1624 2436
200 250	1281 1601	1890 2363	2398 2998	2805 3506	3248 4060
300 350	1922 2242	2836 3309	3598 4197	4207 4909	4873 5685

400 450	2562 2863	3781 4254	4797 5397	5610 6311	6497 7309
500 550	3203 3523	4727 5199	5997 6596	7013 7714	8121 8933
600 650	3847 4164	5672 6145	7196 7796	8415 9117	9745 10558
700 750	4484 4804	6617 7090	8395 8995	9818 10519	11370 12182
800 850	5125 5445	7563 8036	9595 10195	11220 11922	12994 13806
900 950	5765 6086	8508 8981	10794 11394	12623 13324	14168 15430
1000	6406	9454	11994	14026	16243

Table 1 Cargo and moments variation in the main compartment (Zones I thru V)

Moments for loads that exceed 1000 kg may be calculated by addition.

WEIGHT (kg)	MOMENT (kg.m)
10	184,68
20	369,36
30	554,04
40	738,72
50	923,40
60	1108,08
70	1292,76
80	1477,44
90	1662,12
100	1846,80
110	2031,48
120	2216,16
130	2400,84
140	2585,52
150	2770,20
160	2954,88
170	3139,56
180	3324,24
190	3508,92
200	3693,60
210	3878,28
220	4062,96
230	4247,64
240	4432,32
250	4617,00

Table 2 Cargo and moments variation in ramp (Zone VI)

6 TRANSPORT OF PLATFORMS

6.1 GENERAL

The platforms designed for loads transport or those designed for air deliveries are consistent with loads handling system of the aircraft.

The width of all platforms is 88” (2,23 m), the length is variable according to the platform type and it should be measured on the longitudinal center line of the aircraft.

The combinations studied in this manual are as follows:
– Ten platforms of 54”, two of each in ramp
– Five platforms of 108”, one of each in ramp
– Three platforms of 125”, plus one platform of 108” in ramp.

6.2 TRANSPORT OF ONE PLATFORM OF 108” IN RAMP

CAUTION

THE MAXIMUM LOAD PERMITTED ON THE RAMP IS 1000 KG (2204 LB), INCLUDED THE WEIGHT OF THE PLATFORM.

The situation of the center of gravity shown in Table 3, as reference, is SIT. 18,604 m.

WEIGHT (kg)	MOMENT (kg.m)
50,00	930
100,00	1860
150,00	2791
200,00	3721
250,00	4651
300,00	5581
350,00	6511
400,00	7442
450,00	8372
500,00	9302
550,00	10232
600,00	11162
650,00	12093
700,00	13023
750,00	13953
800,00	14883
850,00	15813
900,00	16744
950,00	17674
1000,00	18604

Table 3 Cargo and moments variation — One platform of 108” in ramp

6.3 TRANSPORT OF TEN PLATFORMS OF 54", TWO OF THEM IN RAMP

CAUTION

THE WEIGHT OF PLATFORM SHOULD NOT EXCEED THOSE LIMITS VALUES INDICATED IN CA-A-08-40-13-00A-000A-A.

The maximum weight for the platforms located in the main compartment is determined by the lineal distribution of load, however the platforms in ramp are limited to 500 kg each one (See Figure 5).

The Table 4 indicates the maximum load and the position of the center of gravity of each platform.

PLATFORM N°	MAX. WEIGHT (kg)	ARM (m)	MOMENT (kg.m)
1	1371	4,822	6611
2	1371	6,346	8700
3	1508	7,870	11868
4	1508	9,394	14166
5	1783	11,172	19920
6	1508	12,696	19146
7	1371	14,220	19496
8	1371	15,744	21585
9 (ramp closed)	500	17,888	8944
10 (ramp closed)	500	19,319	9660

Table 4 Weight and moment — Ten platforms of 54"

6.4 TRANSPORT OF FIVE PLATFORMS OF 108", ONE OF THEM IN RAMP

CAUTION

THE WEIGHT OF PLATFORM SHOULD NOT EXCEED THOSE LIMITS VALUES INDICATED IN CA-A-08-40-13-00A-000A-A.

The maximum weight for the platforms located in the main compartment is determined by the lineal distribution of load, however the platform in ramp is limited to 1000 kg (See Figure 6).

The Table 5 indicates the maximum load and the position of the center of gravity of each platform.

PLATFORM N°	MAX. WEIGHT (kg)	ARM (m)	MOMENT (kg.m)
1	2743	7,108	19497
2	3017	9,902	29874
3	3017	12,696	38304

4	2743	15,490	42489
5 (ramp closed)	1000	18,604	18604

Table 5 Weight and moment — Five platforms of 108”

6.5 TRANSPORT OF THREE PLATFORMS OF 125”, PLUS ONE PLATFORM OF 108” IN RAMP

CAUTION

THE WEIGHT OF PLATFORM SHOULD NOT EXCEED THOSE LIMITS VALUES INDICATED IN CA-A-08-40-13-00A-000A-A.

The maximum weight for the platforms located in the main compartment is determined by the lineal distribution of load, however the platform in ramp is limited to 1000 kg (See Figure 7).

The Table 6 indicates the maximum load and the position of the center of gravity of each platform.

PLATFORM N°	MAX. WEIGHT (kg)	ARM (m)	MOMENT (kg.m)
1	3175	7,348	23330
2	3492	10,727	37459
3	3492	14,105	49255
4 (ramp)	1000	18,604	18604

Table 6 Weight and moment — Three platforms of 125” and one platform of 108”

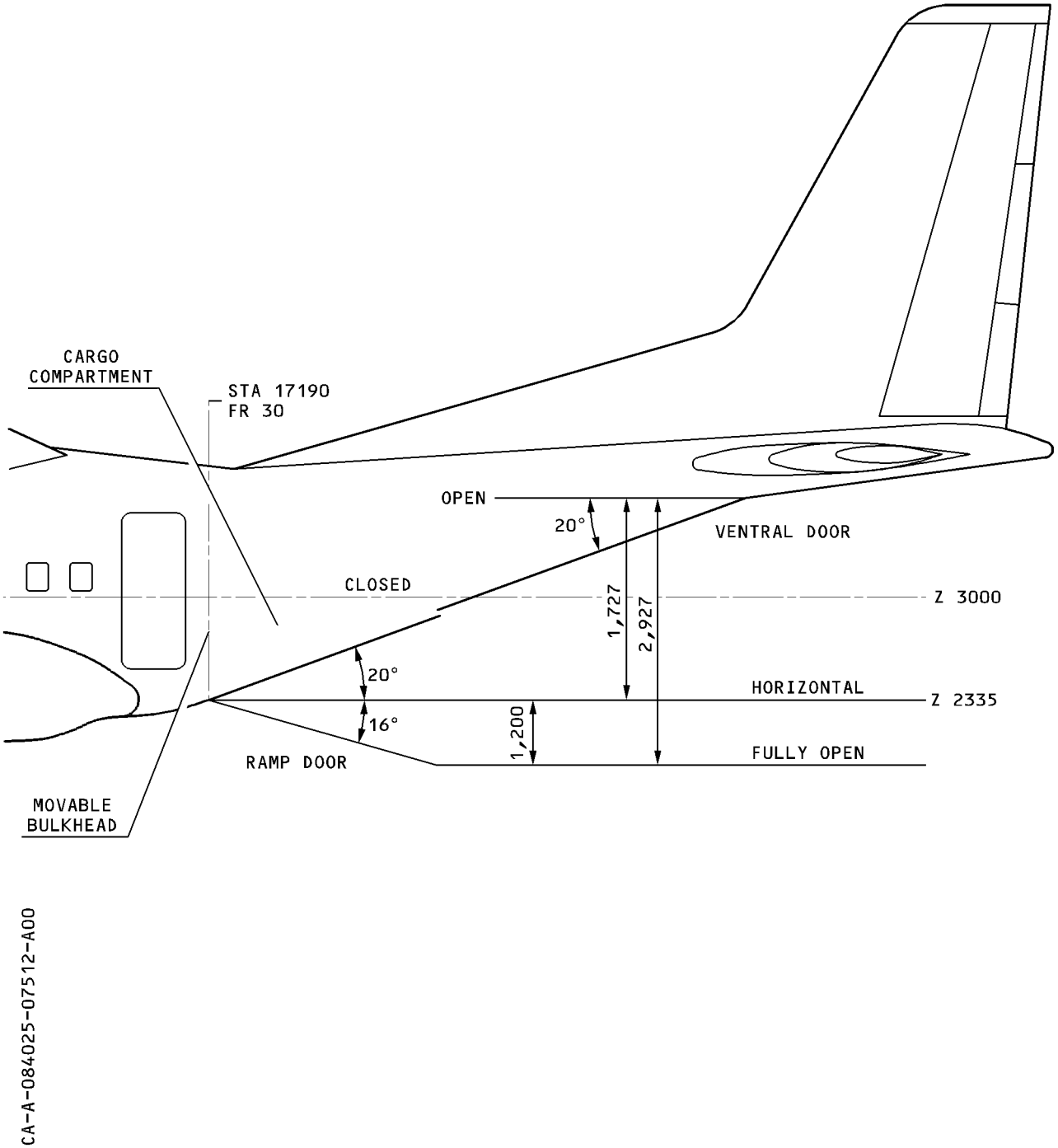

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Figure 1 Access to Cargo Compartment

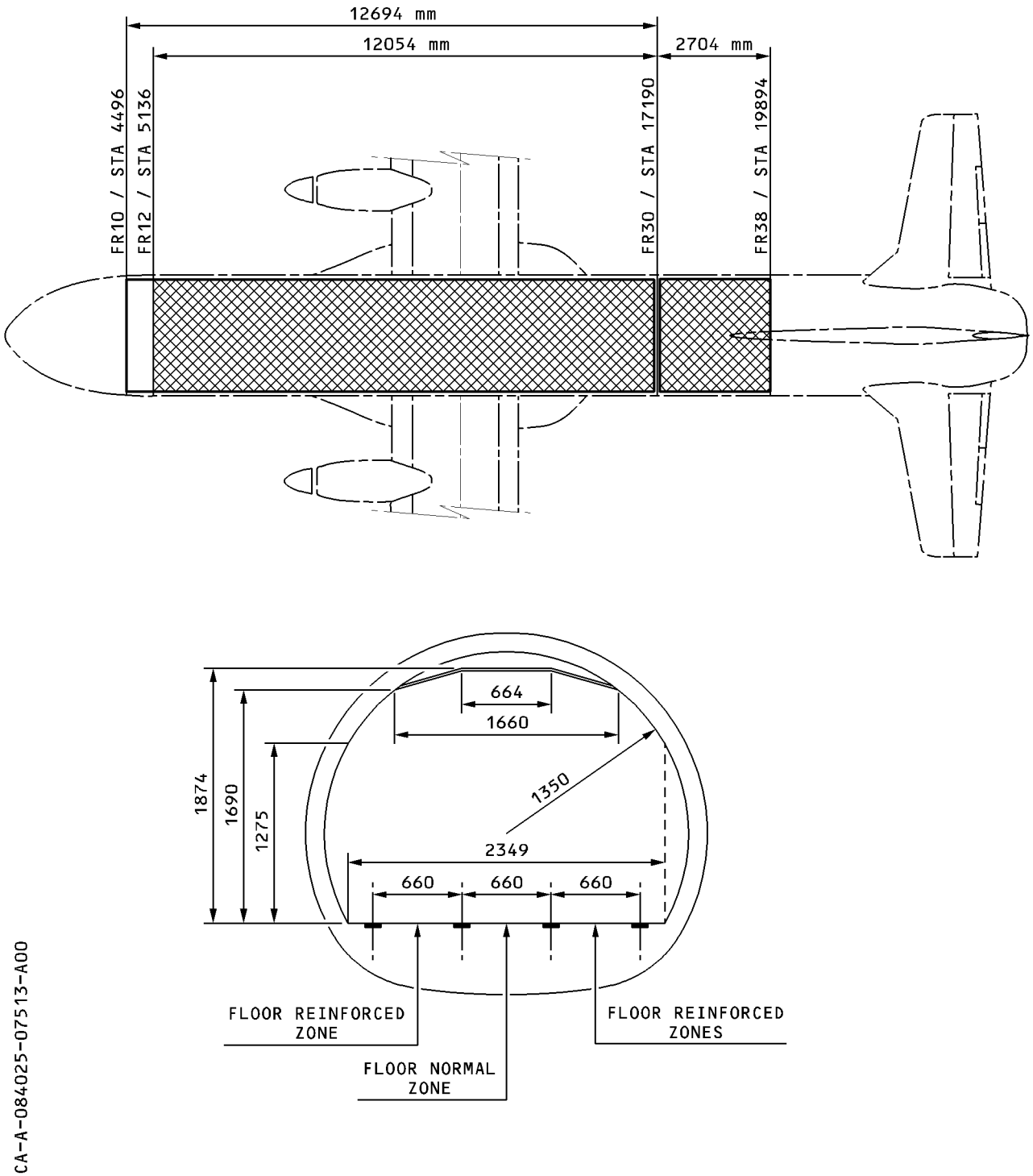

Figure 2 Dimensions of Cargo Compartment

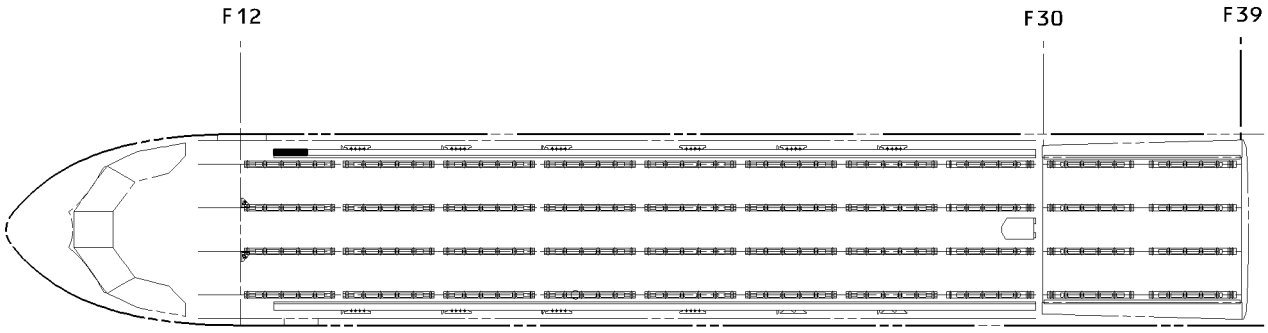

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Figure 3 Air Delivery Cargo System

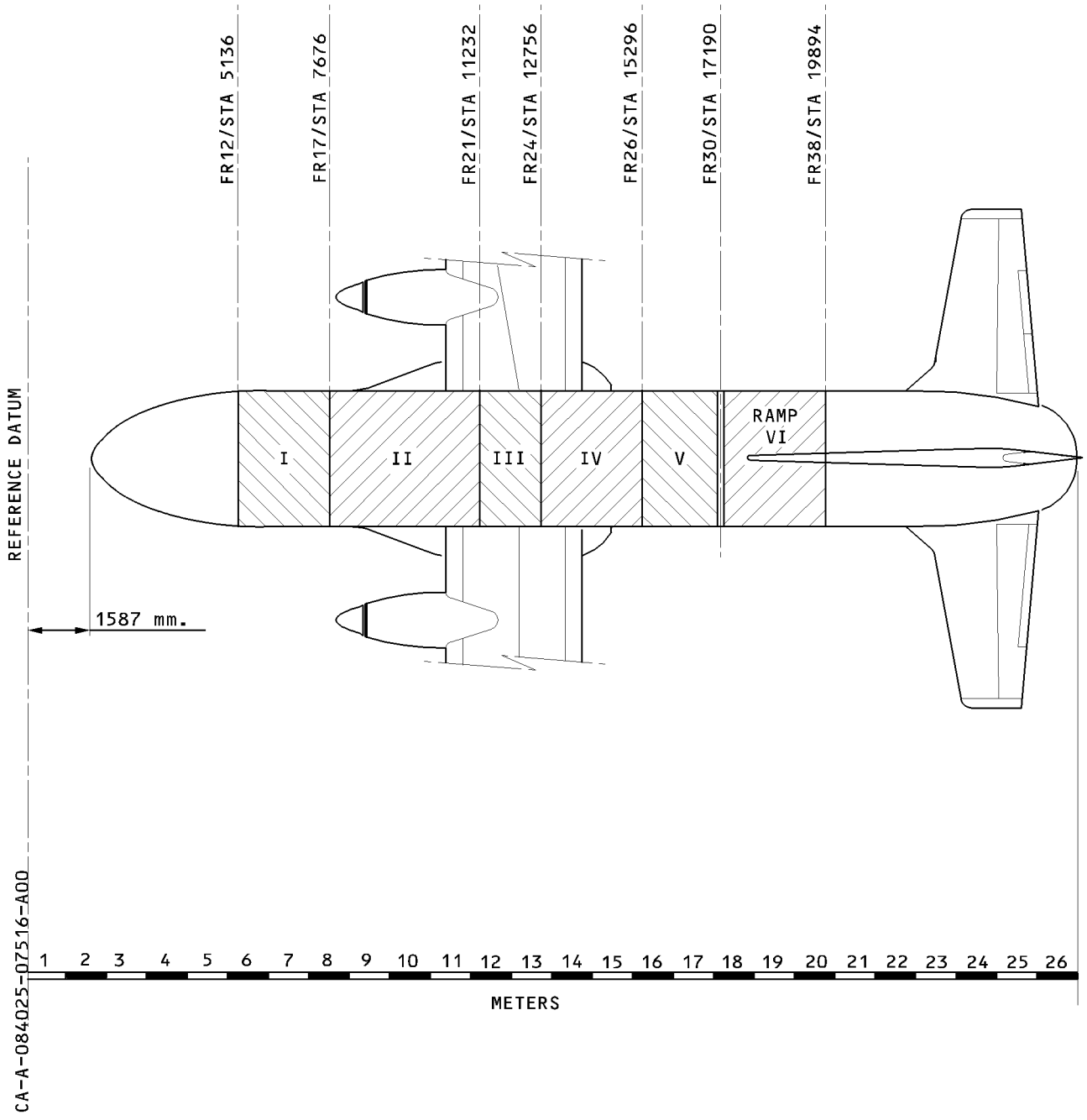

Figure 4 Main Compartment - Cargo Zones

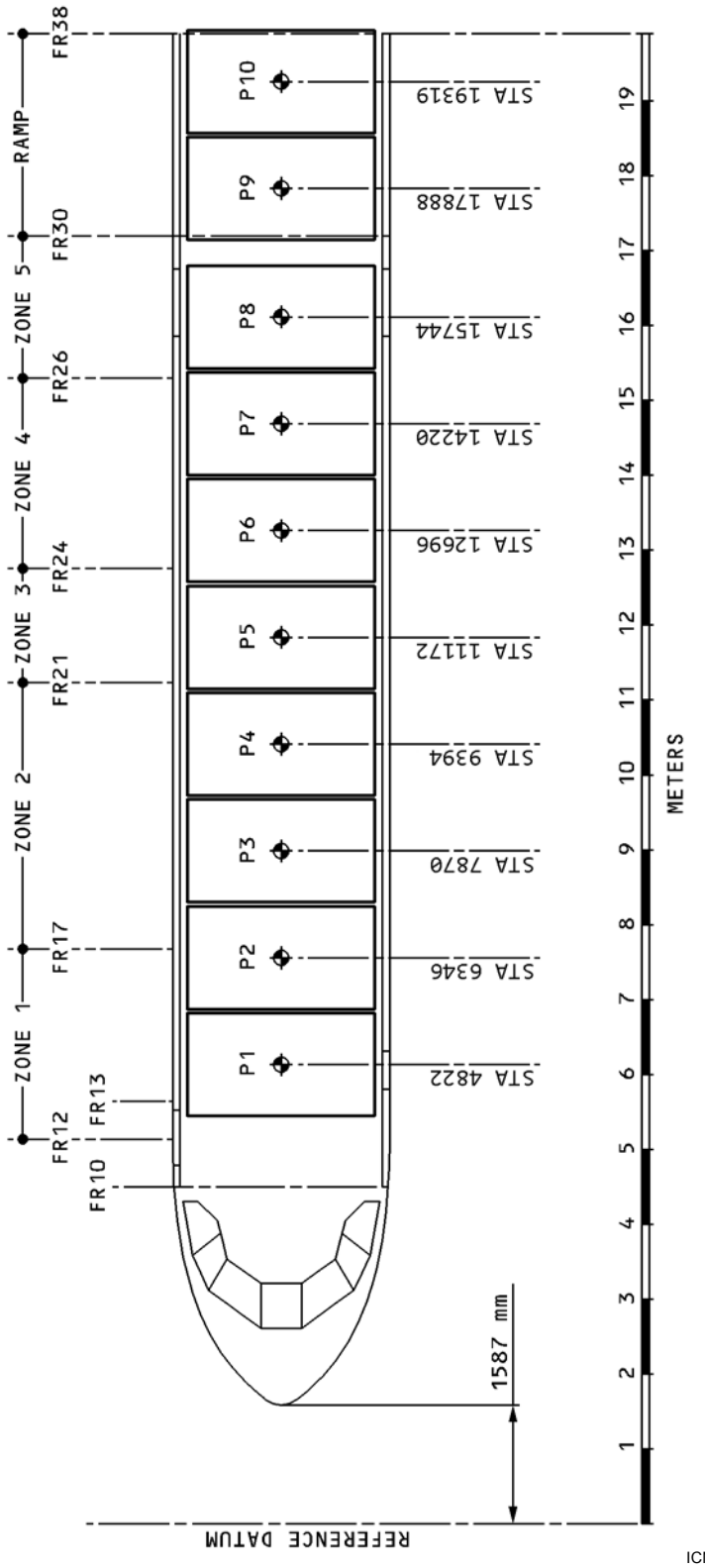

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Figure 5 Transport of Ten Platforms of 54”, two of them in Ramp

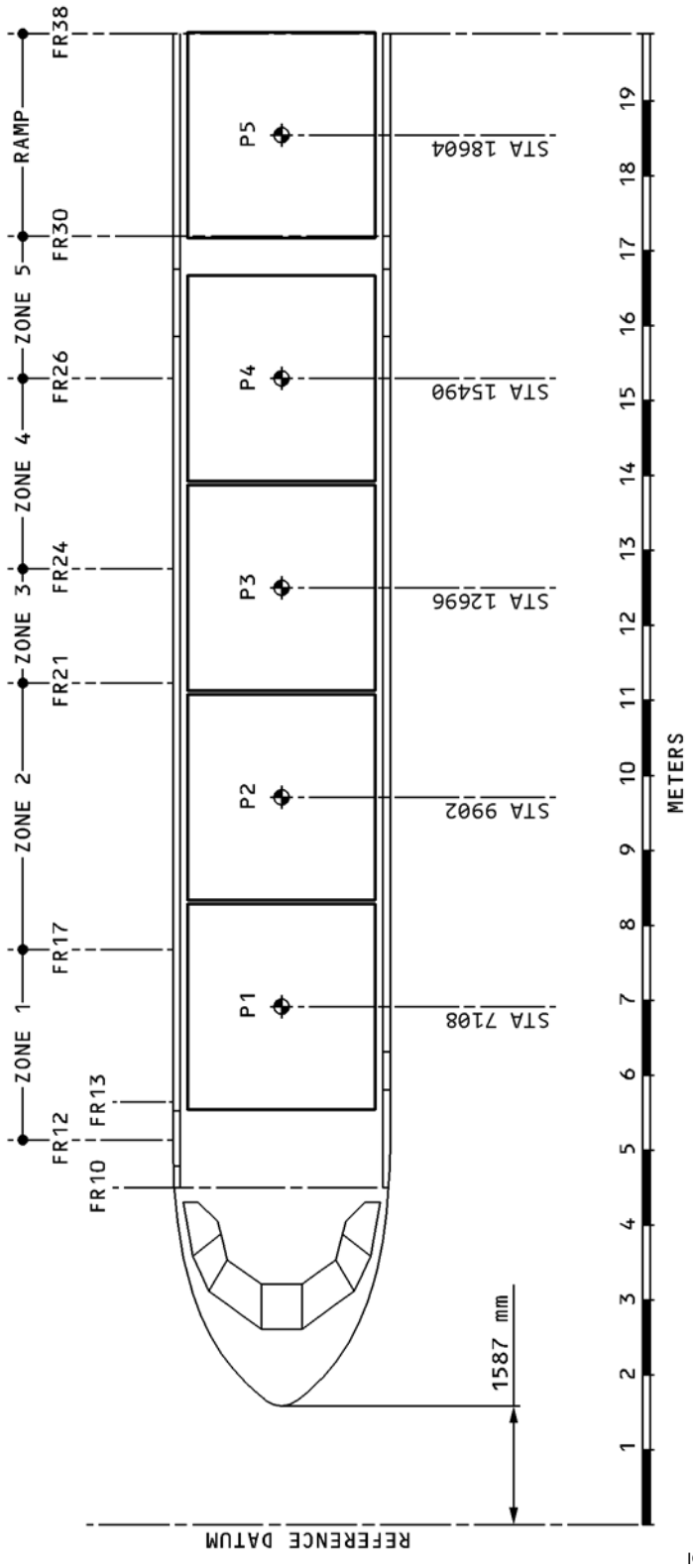

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Figure 6 Transport of Five Platforms of 108”, one of each in Ramp

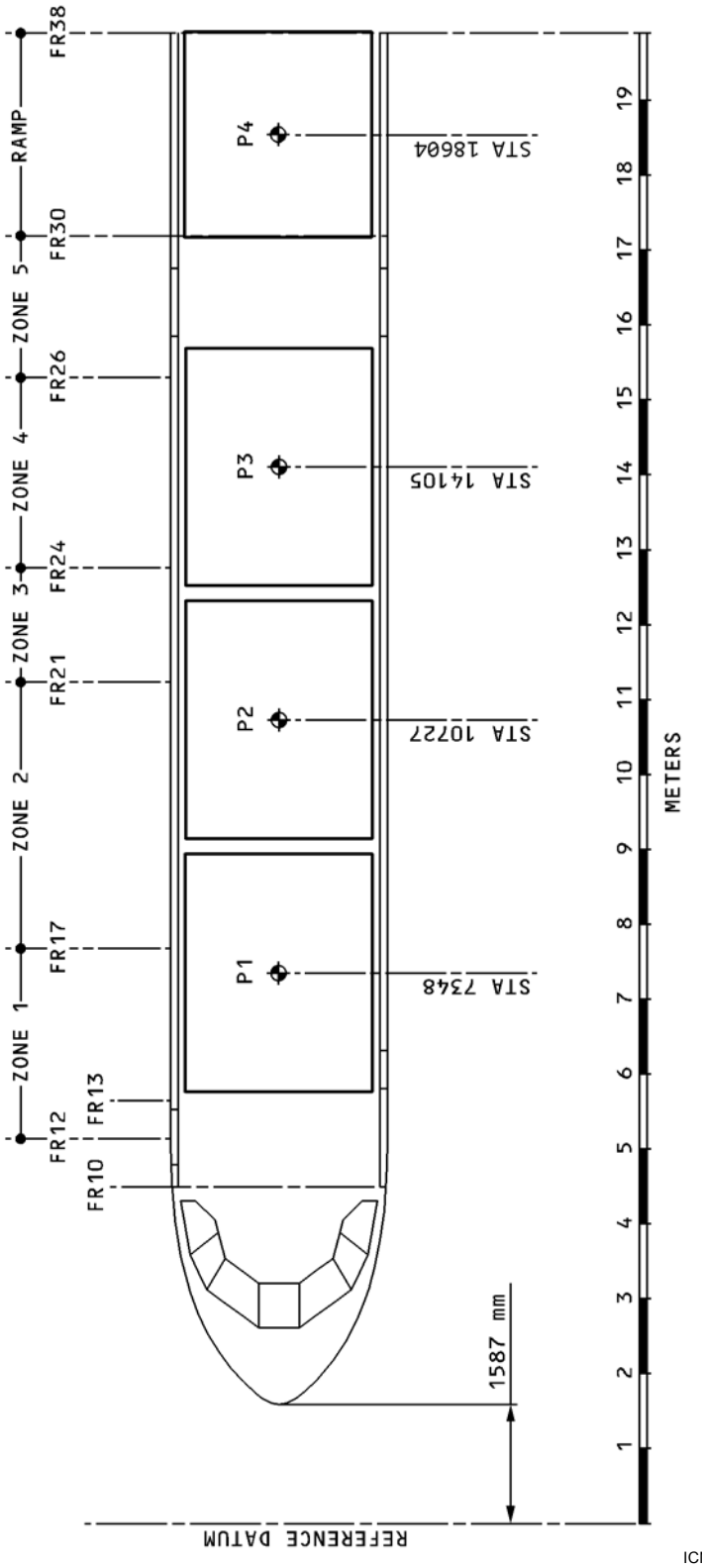

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Figure 7 Transport of Three Platforms of 125”, plus one Platform of 108” in Ramp

WEIGHT AND CENTER OF GRAVITY
Loading System

1 GENERAL

This section describes the use of a loading system for the C-295 aircraft. It also presents a substantiation of compliance with the loading limitations of the airplane as required by pertinent FAR using passenger-seating assumptions in general use in airline operation.

The loading system for this aircraft consists of a graphical addition of weight moment vectors to check the aircraft balance together with a tabular addition of the weights for checking the design weight limitations.

The loading procedure is carried out in three steps:

a. Computation of the operational empty weight
b. Tabular derivation of check weights
c. Graphical balance checks.

These steps are described in detail in CA-A-08-40-31-00O-000A-A.

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LOADING SYSTEM
Loading Procedures

REQUIRED CONDITIONS:
None

SUPPORT EQUIPMENT:
None

SUPPLIES:
None

SPARES:
None

SAFETY CONDITIONS:
None

Procedure

1. Computation of the Operational Empty Weight

1.1. Using the tabular arrangement on the Flight Weight and Balance Form (Table 1), tabulate the weight and moments for the items listed.

1.2. The Basic Empty Weight (BEW) (item 1, Table 1) can be obtained from the applicable Form B. The standard weights and moments for crew members are presented in CA-A-08-40-23-00O-000A-A.

1.3. Care should be taken that all items aboard, with the exception of fuel, passengers and cargo, are included in this weight.

1.4. Get the operational empty weight and their associate moment (items 13 and 14, Table 1), calculate then the position of the center of gravity in % MAC (Refer to CA-A-08-40-12-00A-000A-A).

2. Tabular Derivation of Check Weights

2.1. Using the continuation of the tabular arrangement on the Flight Weight and Balance Form, tabulate the Baggage/Cargo (item 16, Table 1), and Passengers number and weight (item 17, Table 1).

2.2. Tabulate the weight of fuel aboard (items 19 and 20, Table 1). Add this weight to the Actual Zero Fuel Weight (item 18, Table 1). This is the Taxi Weight and it must not exceed the maximum ramp/taxi weight (MTW).

NOTE

If the resulting weight is larger than the Maximum Take off Weight (MTOW), the fuel burned during taxi operations must reduce the weight so that the Maximum Take off Weight (MTOW) at take off is not exceeded.

3. Graphical Balance Checks

NOTE

For accurate results while using this loading procedure:
– Carefully plot the point indicating the operational empty weight.
– Carefully set up the balance chart with respect to the weight-moment diagrams. Vertical index unit scales and horizontal weight scales must be parallel.
– Carefully trace the vectors and neatly mark the end of each vector.

3.1. Plot the operational empty weight (OEW) and situation of CG in % MAC (items 13 and 15, Table 1) in the Diagram of Flight Weight and Balance.

3.2. Place the balance chart over the Cargo/Baggage Loading Vector Form so that the Operational Empty Weight point coincides with the zero point on the cargo/baggage loading vector. The balance chart should be oriented so that the guidelines on the loading vector form are parallel to the weight and index unit lines on the balance chart.

3.3. Trace the vector for the applicable weight of baggage/cargo.

CAUTION

THE BOUNDARIES OF THE ENVELOPE AT THE APPLICABLE PASSENGER COUNT MUST LIE WITHIN THE LOADING LIMITS, OTHERWISE THE AIRPLANE IS OUT OF BALANCE AND ADJUSTMENTS MUST BE MADE TO THE LOADING.

3.4. Place the end of the vector traced on step 3.3 over the zero passenger point of the Passenger Weight Moment Envelope and Vector Form (Table 1).

3.5. If the balance check made in step 3.4 shows that the airplane balance is satisfactory, the Passenger Weight-Moment Vector for the applicable number of passengers should be traced on the balance chart.

3.6. Place the upper end of the passenger vector over the zero point of the Fuel Weight-Moment Vector Form and trace off the appropriate vector for the amount of fuel in each applicable tank.

3.7. The upper end of the added fuel weight-moment vectors indicates the weight and moment of the loaded airplane. The weight shown on the Flight Weight and Balance Chart should agree closely with that derived from the tabulations on the Flight Weight and Balance Form. The balance in % MAC should be read on the chart and recorded in the space provided in item 21 (Table 1).

FLIGHT WEIGHT AND BALANCE FORM			
ITEMS		WEIGHT kg	MOMENTS kg.m
1	Basic Empty Weight		
2	Pilots (2)		
3	Fwd Observer		
4	Cargo Master		
5	Crew Luggage		
6	Crew Briefcases		
7	Cockpit Manuals		
8	Crew Coatroom Load		
9	Galley Load		
10	Misc. Cabin Supplies		
11	Lavatory Supplies		
12	Emergency Equipment		

13	Operational Empty Weight		
14	Moment		
15	Location CG % MAC		
16	Cargo/Baggage		
17	Passenger (Number)		
18	ZFW		
19	Fuel-Main Tanks		
20	Fuel-Aux. Tank		
21	Taxi Weight		
22	Location CG % MAC		

Table 1

4. Construction of Loading Vectors

The Flight Weight and Balance Chart is used for balance analysis and uses a weight ordinate and an index unit abscissa. The load and index unit data for cargo/baggage, passengers and fuel presented in corresponding sections of this document were used directly for constructing suitable vectors appropriate for use on the chart.

In preparing the Passenger Weight Moment Envelope and Vector, it was assumed that passengers are loaded front to rear and rear to front, window seats first, and remaining aisle seats last. Tangents to the curves are then drawn to produce a "normalized" more probable loading envelope. The vector used for nominal CG determination is based on a mean compartment centred. The envelope of probable seating patterns just described is used for checking the possibility of exceeding the forward and aft loading limits.

5. Close up

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CENTROGRAMMES
General Information

1 APPLICABLE CENTROGRAMMES

The applicable centrogrammes are:
– WEIGHTS AND CENTER OF GRAVITY LIMITS (Figure 1)
– FUEL WEIGHT MOMENT CENTROGRAMME (Figure 2)
– CONFIGURATION 70 PASSENGERS CENTROGRAMME (Figure 3)
– CONFIGURATION 49 PASSENGER CENTROGRAMME (Figure 4)
– MEDEVAC CONFIGURATION 24 STRETCHERS CENTROGRAMME (Figure 5)
– CARGO CONFIGURATION - 10 PLATFORMS OF 54” CENTROGRAMME (Figure 6)
– CARGO CONFIGURATION - 5 PLATFORMS OF 108” CENTROGRAMME (Figure 7)
– CARGO CONFIGURATION - 3 PLATFORMS OF 125” AND 108”CENTROGRAMME (Figure 8)

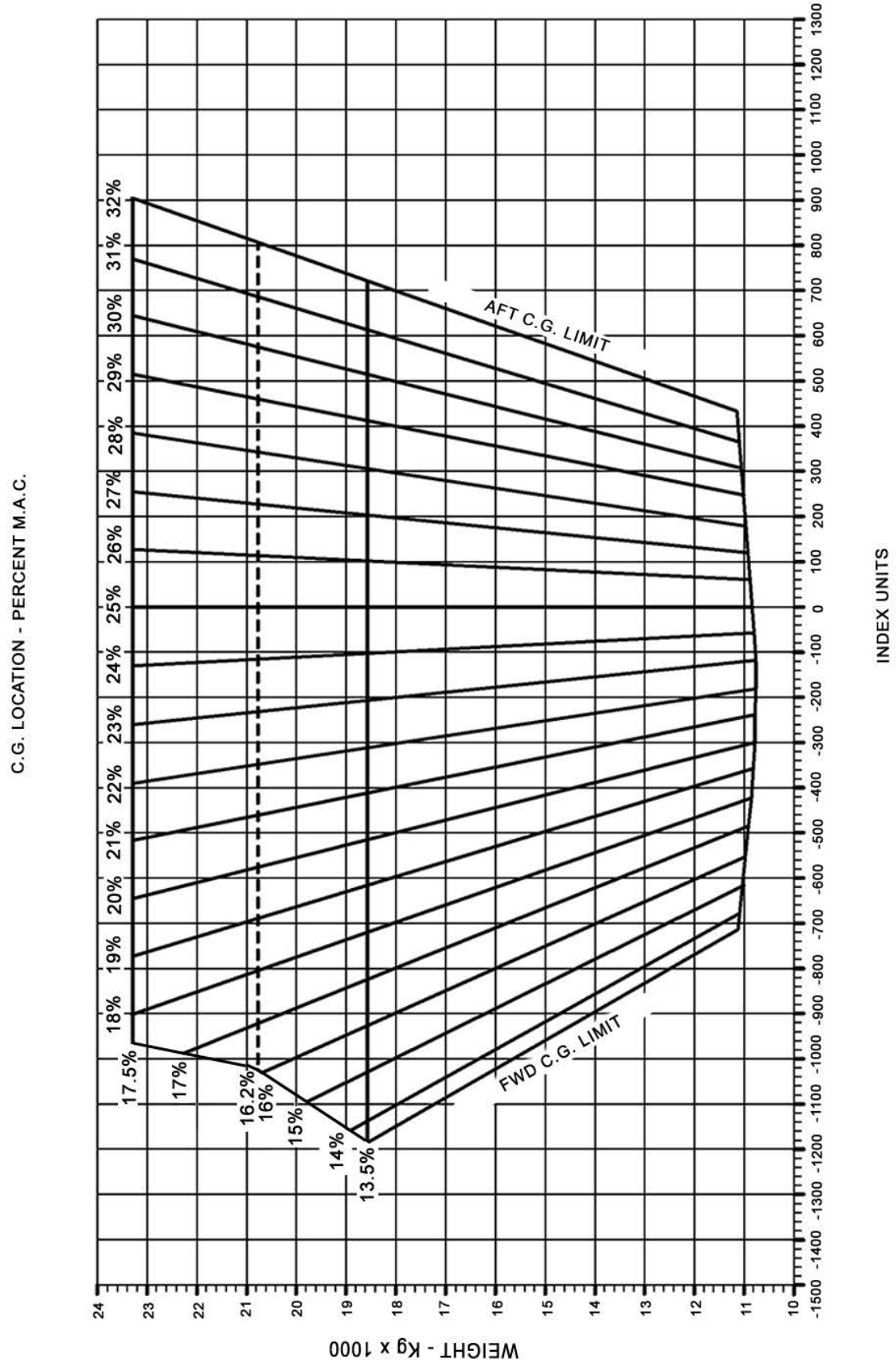

Figure 1 Weights and Center of Gravity Limits

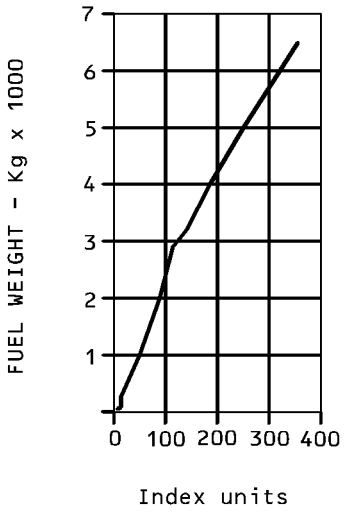

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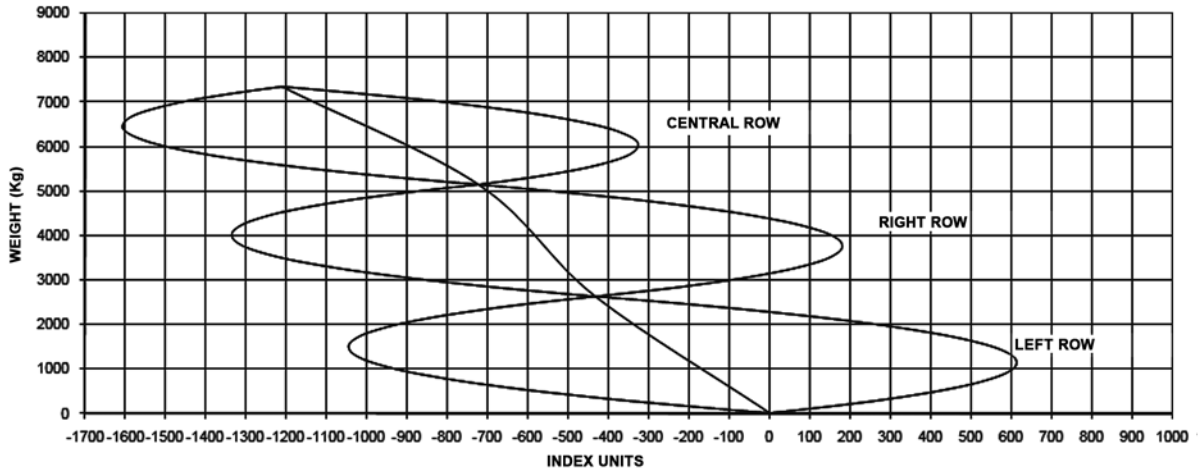
Figure 2 Fuel Weight Moment Centrogramme

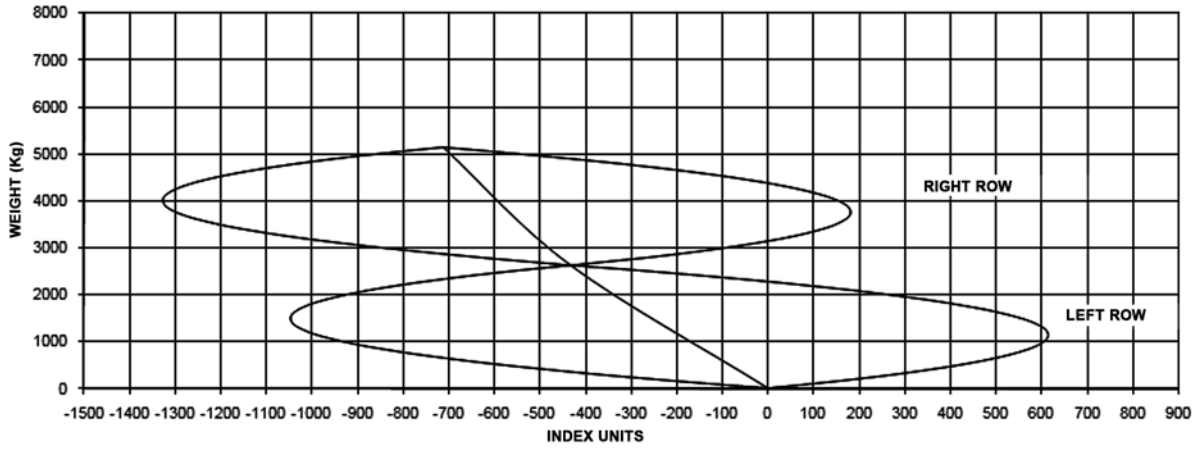


In the graph the effect of 90 Kg is considered in each seat.

CA-A-084040-07530-B01

ICN-CA-A-084040-I-0117B-07530-B-01-1

Figure 3 Configuration 70 Passengers Centrogramme

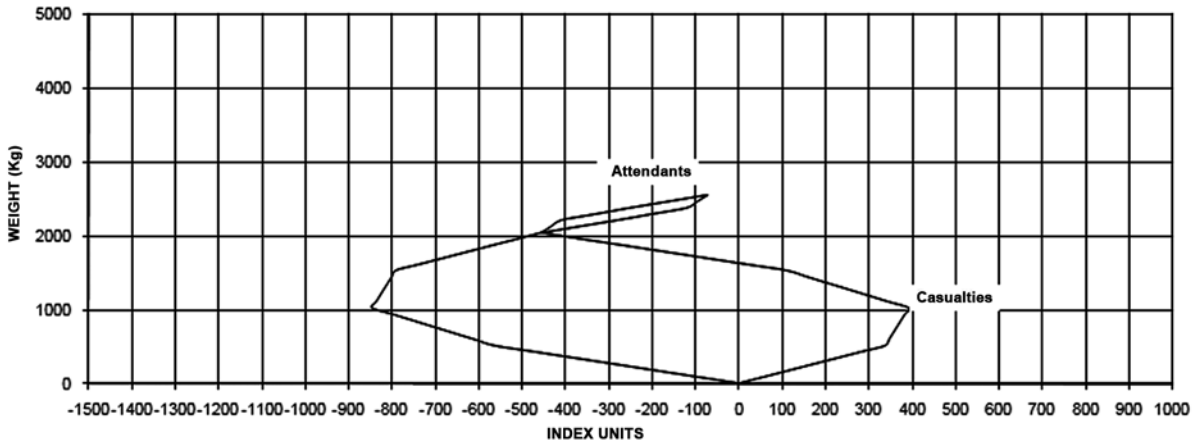


In the graph the effect of 90 Kg is considered in each seat.

CA-A-084040-07531-B01

ICN-CA-A-084040-I-0117B-07531-B-01-1

Figure 4 Configuration 49 Passengers Centrogramme



In the graph the effect of 90 Kg is considered in each seat.

CA-A-084040-07532-B01

ICN-CA-A-084040-I-0117B-07532-B-01-1

Figure 5 MEDEVAC Configuration — 24 Stretchers Centrogramme

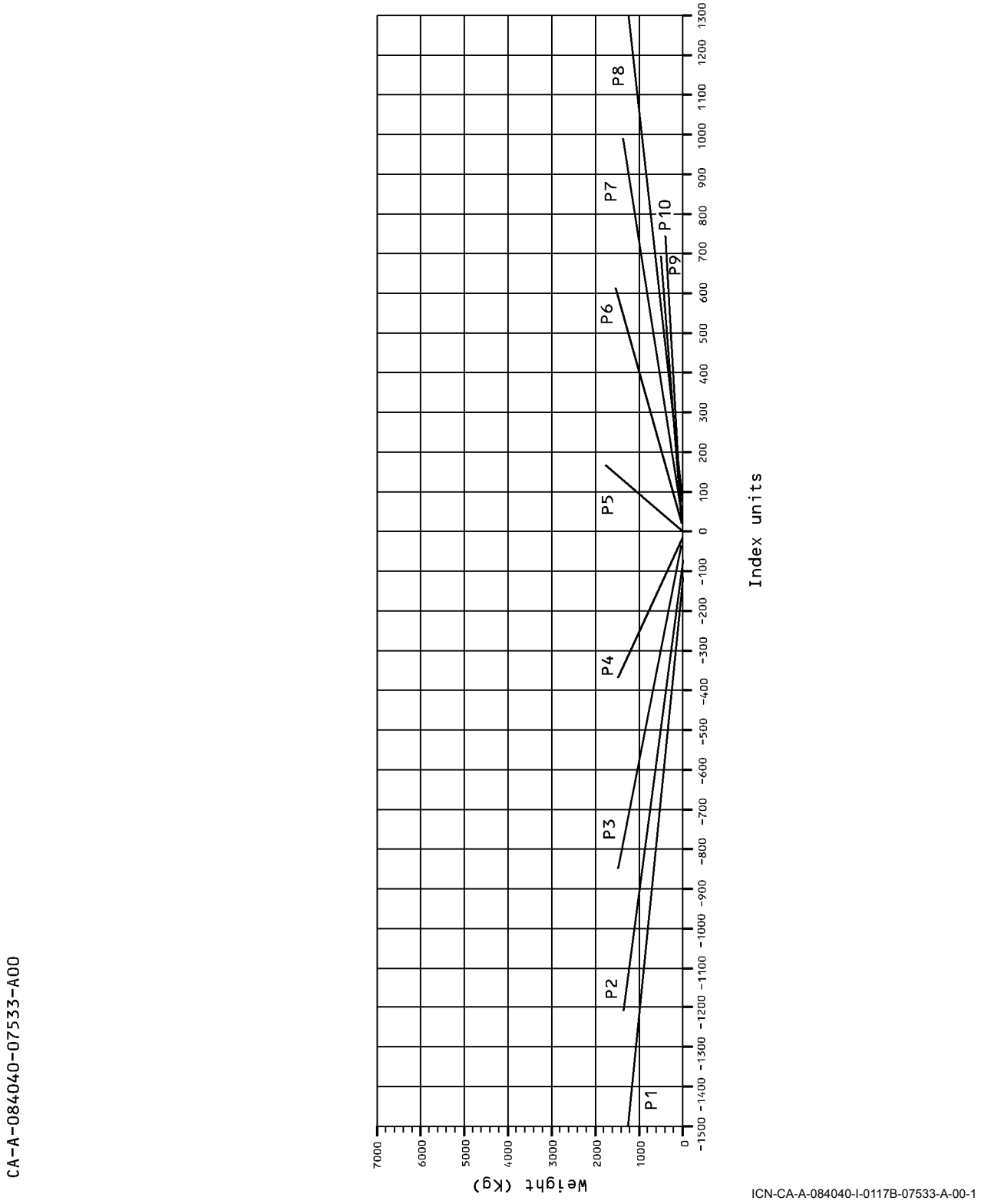


Figure 6 Cargo Configuration 10 Platforms of 54” Centrogramme

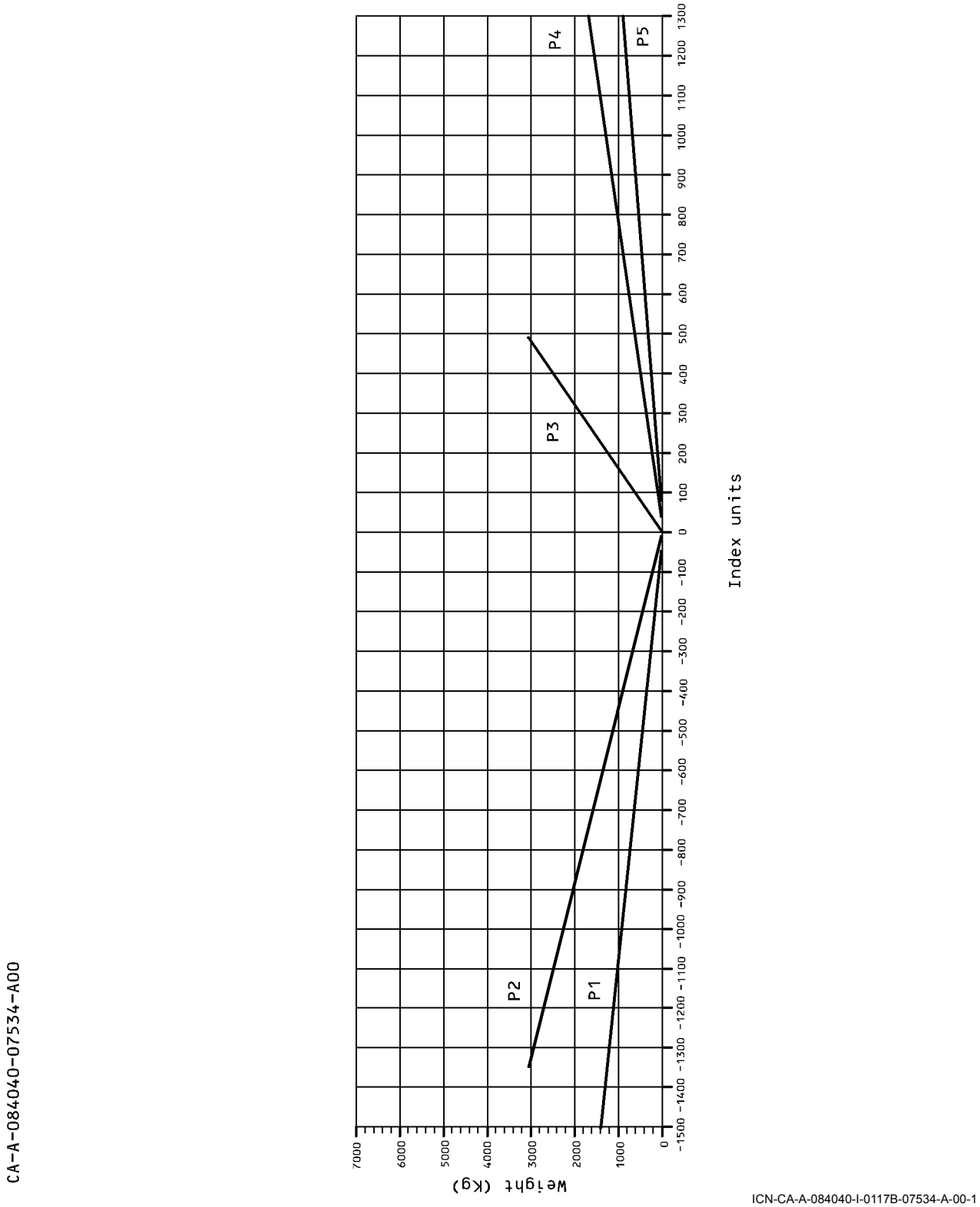


Figure 7 Cargo Configuration 5 Platforms of 108” Centrogramme

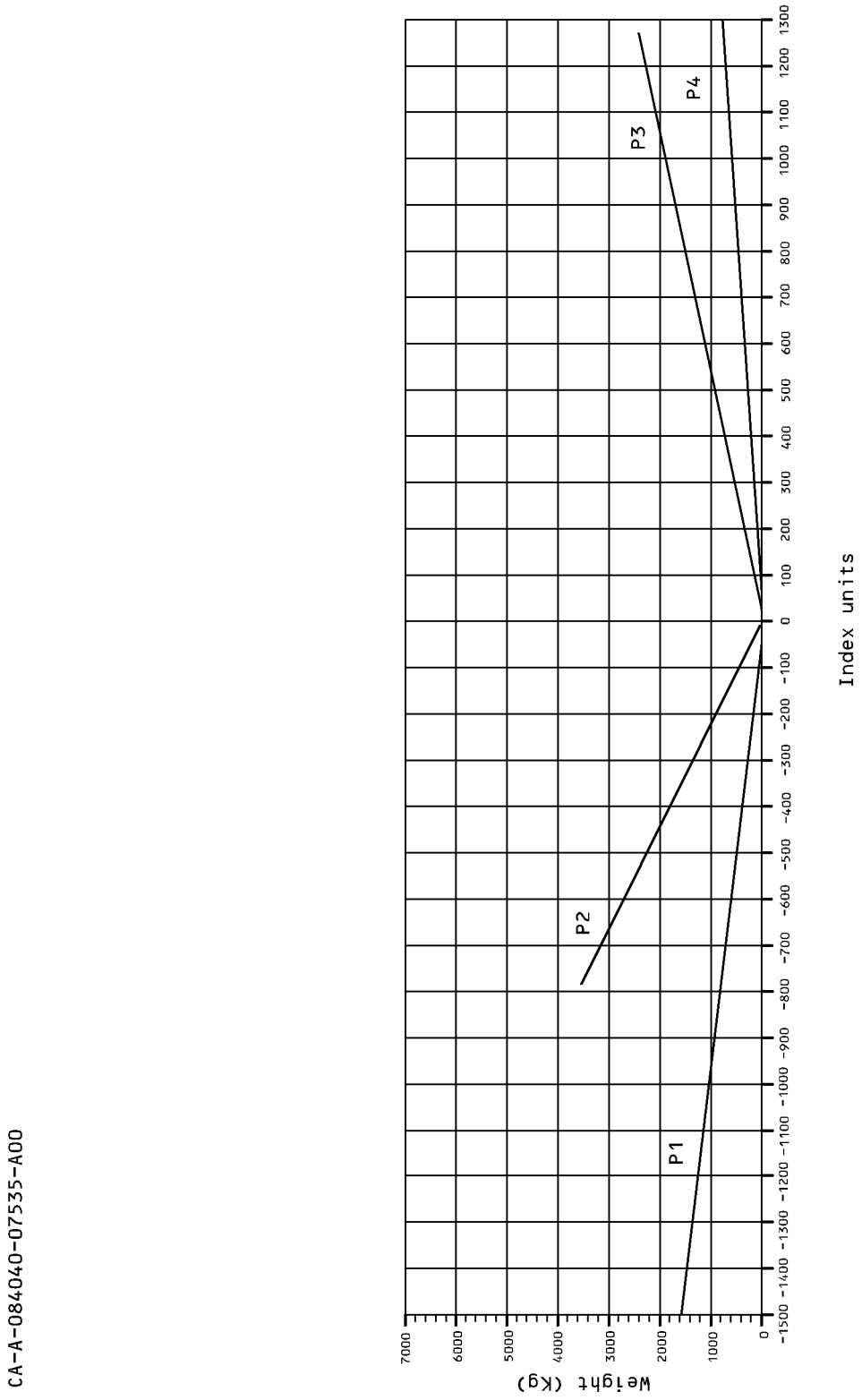


Figure 8 Cargo Configuration 3 Platforms of 125” and 108” Centrogramme

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