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GTI/PAC B744F/ERF

Atlas Air / Polar Air Cargo B747-400F/ERF

Revision: 2
Date: 27 November 2024

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Page	Date	Comment
15	28 November 2024	ULD types no longer in the DHL Network removed. *(Minor)*
23	28 November 2024	Guidance on the handling of special loads information added. *(Minor)*
25	28 November 2024	Global Airside replaced with Special Loads Regional contact. *(Minor)*

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1. Atlas Air / Polar Air Cargo B747-400F-ERF Registrations

IATA Designator: **5Y/PO**

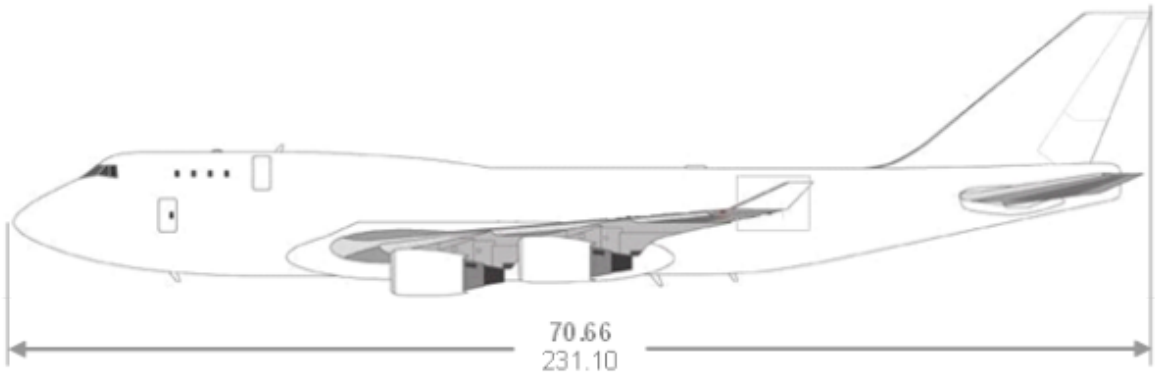
ICAO Designator: **GTI/PAC**

Valid for: **N450PA, N451PA, N452PA, N453PA, N454PA, N408MC, N409MC, N412MC, N415MC, N416MC, N418MC, N419MC, N445MC (ERF), N446MC (ERF), N492MC, N493MC, N496MC, N497MC, N498MC, N499MC, N477MC.**

Aircraft Dimensions

All dimensions in Meters and Feet/Inches.





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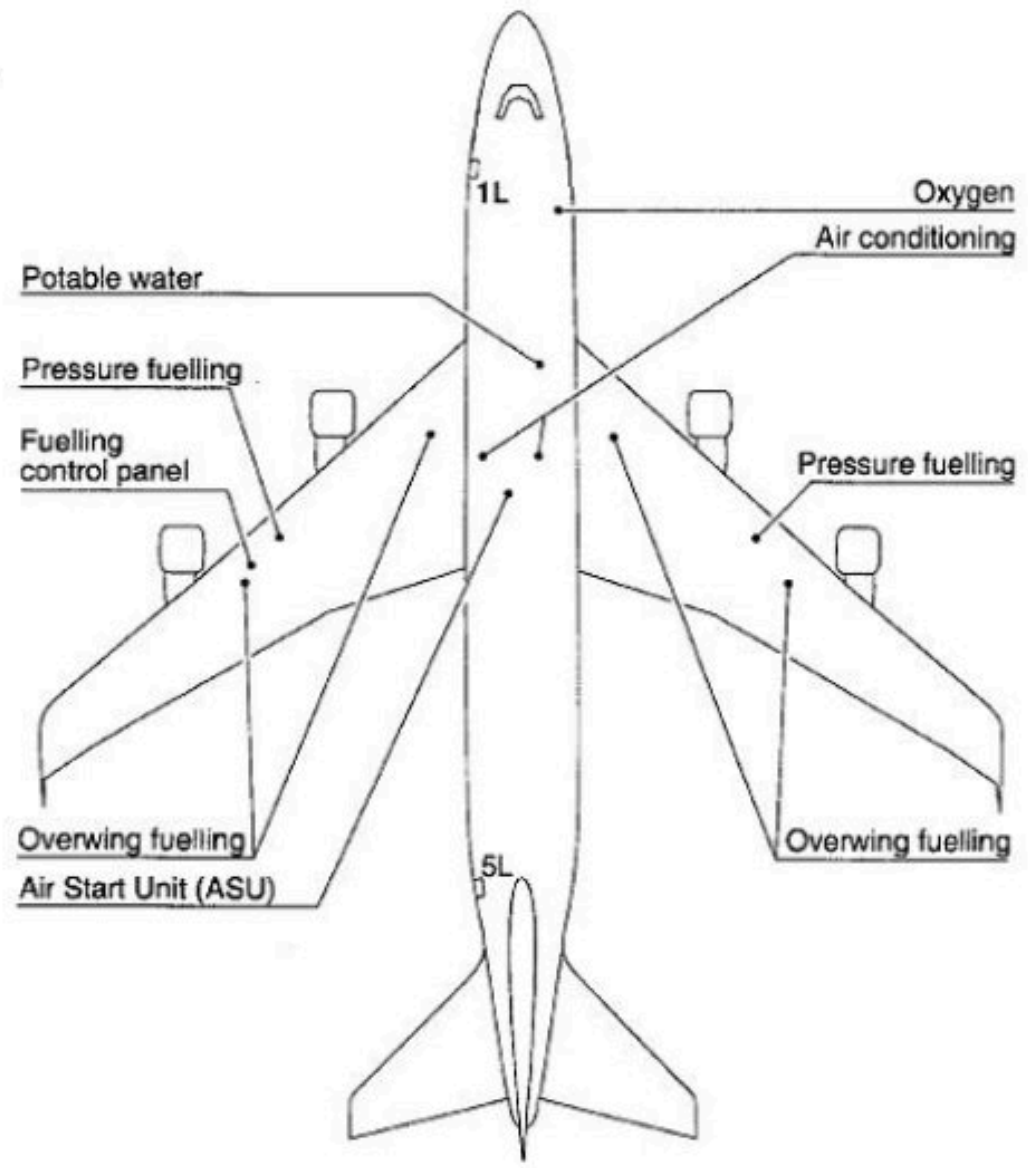
2. Aircraft Servicing Points and Specifications

2.1 Servicing Points



2.2 Servicing Specifications

System	Requirements	Notes
Ground Power Unit	115/125V AC / 90 kVA / 400 Hz	2 GPU connections required (2 x 90 kVA)
Fuel	Jet A1	Fuel control panel on **LH wing only**
Air Condition Unit	Maximum Flow Rate 700 ppm	2 ACU inlets available
Air Start Unit	Minimum Capacity 240 ppm Max. / Min. pressure 35 / 45 psi	2 ASU inlets available. 2 ASUs may be required, depending on flow rate and ambient air temperature.

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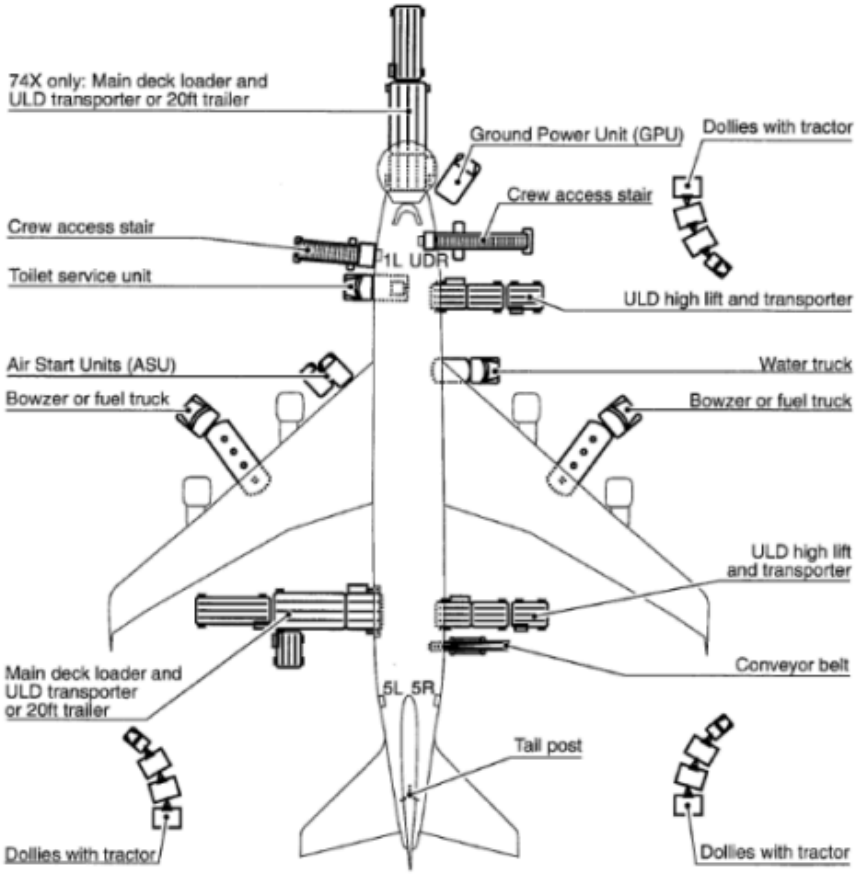
3. Ground Support Equipment

3.1 Positioning of GSE



3.2 GSE Requirements

GSE	Type	Quantity
High Loader	Main-deck Standard	1 or 2* 2
Crew stairs	Platform height 4.65 – 5.36 meters	1
Ground Power Unit	Diesel, Electric or Ground-Power	1
Belt Loader	Standard (9 meter recommended)	1
Tractor	N/A	6
Dolly Wagon Main-deck	125/88” and 125/96” capable	Up to 30
	16 & 20ft capable	Up to 12
Dolly Wagon Lower-deck	125/88” and 125/96” capable	Up to 9
	60.4/61.5” or 60.4/125” capable	Up to 7
Belly Container / Wagon	As required	According to load
Nose Tether	As available at local station	1

* 2 Main-deck loaders required if loading/un-loading via both the side-cargo door and the nose-door.

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4. Standard Turnaround Times

Turn-around time for a transit stop: 01:30 hour (partial off- and on-load)
Turn-around time for an end stop: 02:00 hour (full off- and on-load)

Notes: Tech stops are not within the scope of the above timings.

Deviations from the above timings are possible, but only when in agreement with the operator.

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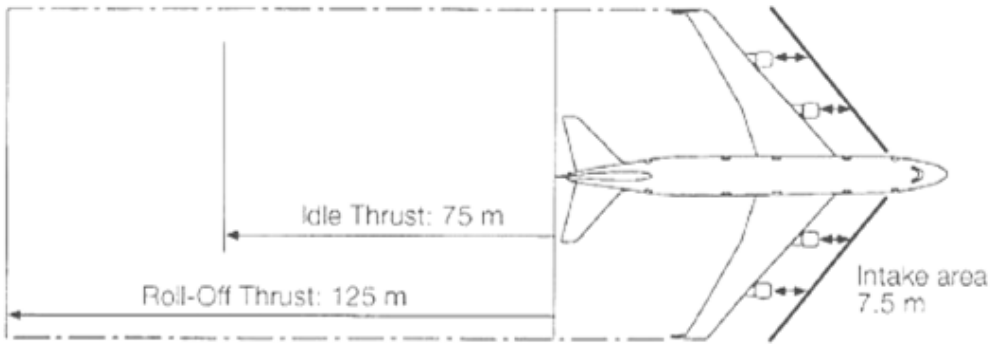
5. Safety Areas



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6. Strong Wind Conditions

If the wind conditions on the ramp reach the following speeds, the corresponding actions shall be taken.

Wind Speed	Action
Up to 40 knots	Normal Operations: All doors can be opened and left open
More than 40 knots	Do not open additional doors
More than 65 knots	All open doors shall be closed immediately

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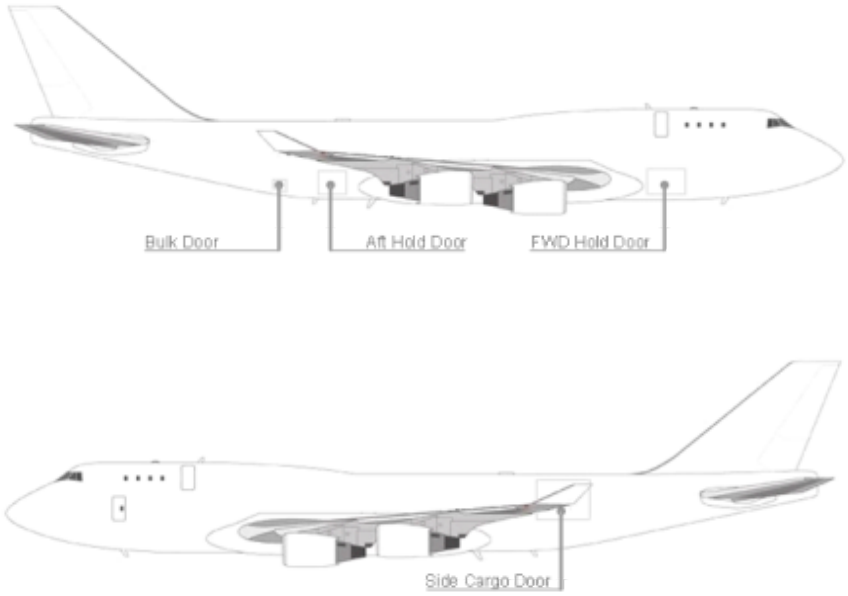
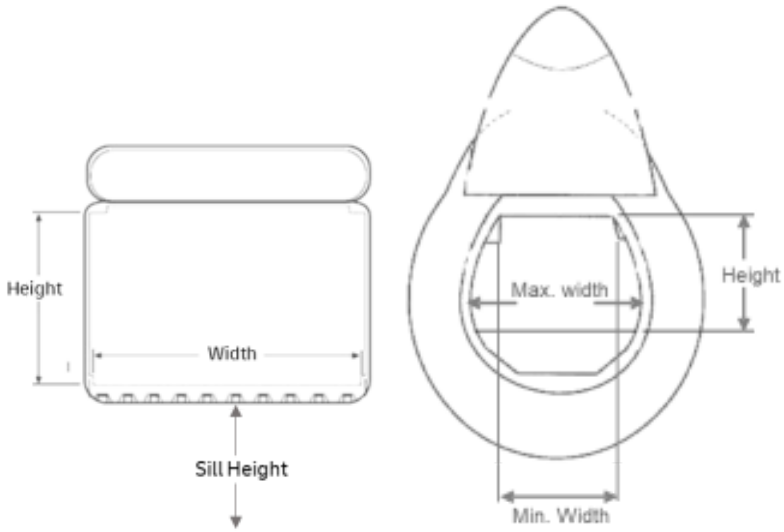
7. Aircraft Door Dimensions



Door width, height, and sill height for Main-deck Side-Cargo Door (SCD) and Main-deck Nose-Cargo Door (NCD):



All dimensions are in centimetres (cm).

Door	Door Width	Door Height	Min. Door Sill Height	Max. Door Sill Height
Crew Door (1L)	-	-	465	536
Main Deck SCD	341	310	467	533
Main-Deck NCD	325 / 264	254	452	546
Forward Hold	264	167*	269	315
Aft Hold	264	167*	290	345
Bulk Hold	111	119	290	353

*The maximum height for a lower-deck ULD is 163 cm (64”).

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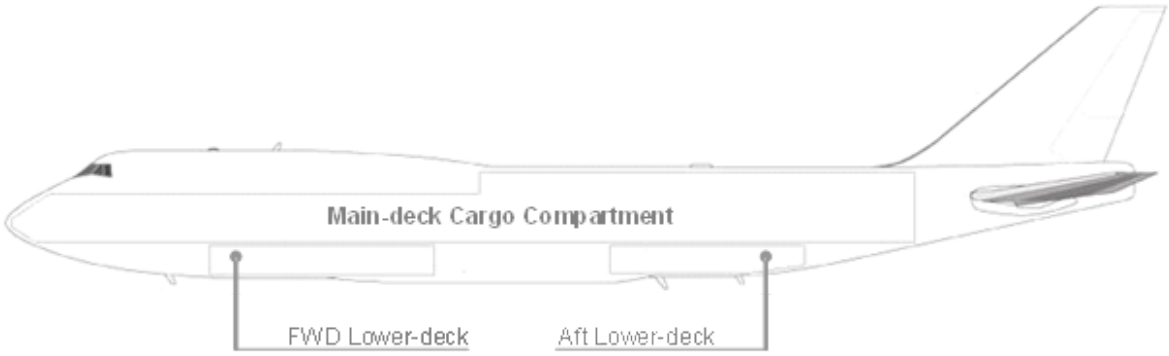
8. Compartment Classification and Air-Conditioning



8.1 Compartment Classification

Compartment	Features
Main-deck	- Classification **B**
	- Pressurisation
	- Smoke Detection
	- **Accessible** during flight (except pos. T)
Lower-deck Compartments 1, 2, 3, 4 and 5	- Classification **C**
	- Pressurisation
	- Smoke Detection
	- **In-accessible** during flight
	- Fire Suppression

8.2 Air-Conditioning

	Main-deck	Forward Hold	Aft Hold	Bulk
Temperature	5C to 30C	16C to 20C	16C to 20c	Around 18C
Heating	Yes			Indirect from aft hold
Head adjust	Yes	No		
Cooling	Yes	No		
Ventilation	Yes	Limited		

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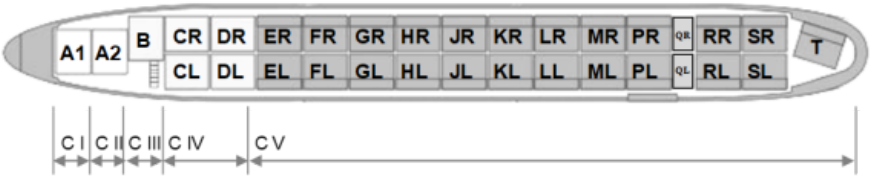
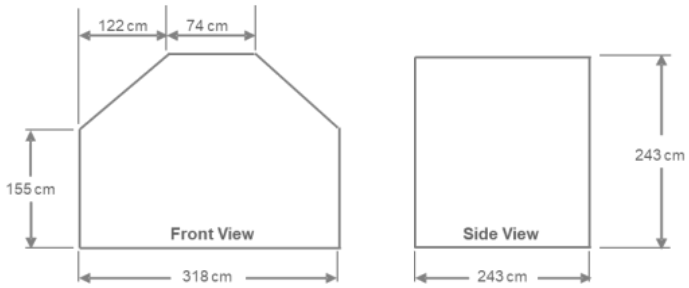
9. Aircraft Cabin Contour Dimensions

The aircraft is divided into five contour zones: CI, CII, CIII, CIV and CV



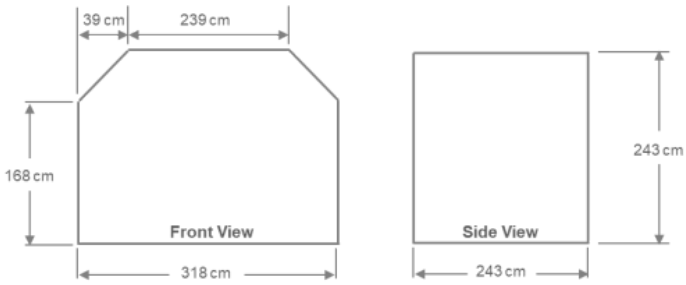
9.1 Contour CI (A1)



This contour is also valid for 88” ULDs (223 cm side view)

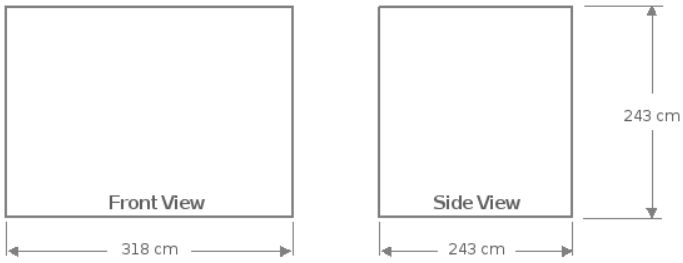
9.2 Contour CII (A2)

Nose Load only, Side Cargo door load same as Contour CIII.



This contour is also valid for 88” ULDs (223 cm side view)

9.3 Contour CIII (B)



This contour is also valid for 88” ULDs (223 cm side view)

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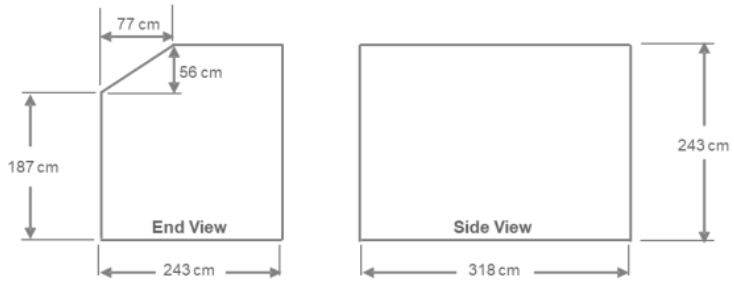
9.4 Contour IV (C-D R/L)



This contour is also valid for 88” ULDs (223 cm side view)

9.5 Contour V (E-S L/R and T)

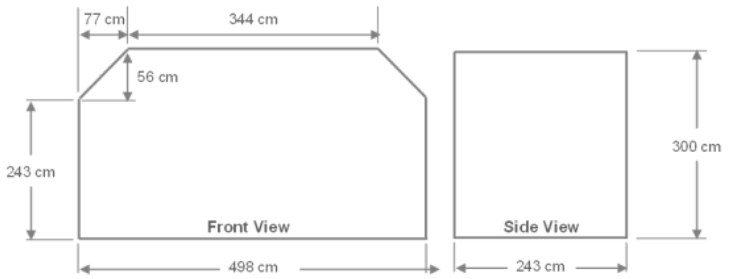


Max height for door position (PL) is 287cm

This contour is also valid for 88” ULDs (223 cm side view)

This contour is also valid for pallets 16ft and 20ft in length (side view) loaded longitudinally

9.6 16ft Lateral Pallets (CC-SS)



Max. Height for positions CC thru SS is 243 cm

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10. Maximum Position Weights

10.1 Maximum Main-deck ULD Weights in Kilograms

	ULD Position																	
ULD Size	**A1**	**A2**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**P**	**Q**	**R**	**S**	**T**
96" Twin-track	3674			6161		8278		15233			8278			6161		6161	8278	2041
96" Centre				9702				16568			9702							2041
20 ft Config. 3a				12000		16000		28842		16000		16000				12000		
20 ft Config. 3b					12000		16000		28842		16000		12000					
16ft Lateral				7401				12614			7401					7401		
96"/55"															2156			

Valid for Registrations: **N445MC and N446MC only**

	ULD Position																	
ULD Size	**A1**	**A2**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**P**	**Q**	**R**	**S**	**T**
96" Twin-track	3674			6123		8210		8210			8164			6123		6123	7257	2041
96" Centre				6123		8210		8210			8164			6123		6123	7257	2041
20 ft Config. 3a				11657		14152		14152		13471		13471				11657		
20 ft Config. 3b					11657		14152		14152		13471		11657					
16ft Lateral				7393				12609			7393					7393		
96"/55"															2156			

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10.2 Maximum Lower-deck Compartment Weights in Kilograms

Note: Valid for all Registrations

10.2.1 Forward Hold

Compt.	Position	Max Gross Weight per ULD (in kilograms)				Max. Hold capacity
		88"/125"	96"/125"	60.4"/61.5" (AKE)	60.4"/125" (ALP)	
1	11P -12P	4626	5035			27669
	11L/R - 13L/R			1587	3175	
2	21P-23P	4626	5035			
	21L/R - 25L/R			1587	3175	

10.2.2 Aft Hold

Compt.	Position	Max Gross Weight per ULD (in kilograms)				Max. Hold capacity
		88"/125"	96"/125"	60.4"/61.5" (AKE)	60.4"/125" (ALP)	
3	31P-32P	4626	5035			26081
	31L/R - 33L/R			1587	3175	
4	41P-42P	4626	5035			
	41L/R - 44L/R			1587	3175	

10.3 Bulk Hold (Compartment 5)

Compt.	Volume (m3)	Max floor load (kg/m2)	Max Weight
51	14.7	730	3375
52			1033

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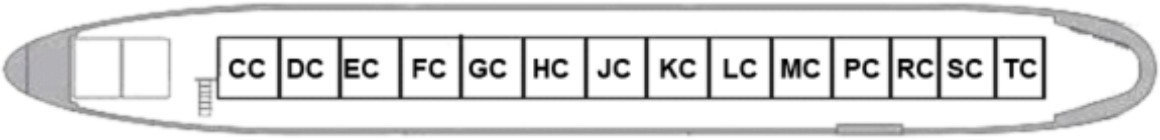
11. Aircraft ULD Compatibility

11.1 Main Deck Configurations

The loading combinations shown here are examples only. More combinations are possible. Full information covering possible loading combinations, and how they interact, can be found in the Sable system.



Configuration 1: 4 Centre-line and 26 Twin-track 125”/96” or 125”/88” positions



Configuration 2: 14 Longitudinal 125”/96” positions



Configuration 3A: 12 Longitudinal Twin-track 16ft or 20ft positions



Configuration 3B: 12 Longitudinal Twin-track 16ft or 20ft positions



Configuration 4: 13 Lateral 16ft positions

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11.2 Main Deck ULD Compatibility

The following ULD type loading restrictions apply. The ULD type can be loaded on positions marked with a 'Y'. The ULD type cannot be loaded on positions marked with a 'N'.

		ULD Type																				
	Pos	AAA	AAC/ LAY	AAJ/ LAK	AAM	AAX	AGA	AMA	AMD	AMH	AMJ	AML	AMP	AMV	AMX	HMJ	PAG	PMC	PGA	PGE	PRA	PUB/ PYB	PZA
Configuration 1	A1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	Y1	Y1	N	N	N	N	N
	A2	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	Y4	Y2	Y2	N	N	N	N	N
	B1	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	Y4	Y2	Y2	N	N	N	N	N
	CL/R	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	Y4	Y2	Y2	N	N	N	N	N
	DL/R	Y	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	Y4	Y2	Y2	N	N	N	N	N
	EL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	FL/E	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	GL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	HL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	JL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	KL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	LL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	ML/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	PL/R	Y	Y	Y	Y	Y	N	Y	Y3	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	QL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y4	N	N	N	N	N	Y5	N
	RL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	SL/R	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
	T	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y4	Y	Y	N	N	N	N	N
Configuration 2	CC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y2	N	N	N	N	N
	DC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y2	N	N	N	N	N
	EC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y2	N	N	N	N	N
	FC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	GC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	HC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	JC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	KC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	LC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	MC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	PC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	RC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	SC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N
	TC	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y4	N	Y	N	N	N	N	N

Y1: PAG and PMC must be built to AAA/AAC contour

Y2: Max. Height 2.44 meters

Y3: AMD not allowed on PL

Y4: HMJ loading to be advised

Y5: See Loading Notes, Position QL and QR

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		ULD Type																				
	Pos	AAA	AAC/ LAY	AAJ/ LAK	AAM	AAX	AGA	AMA	AMD	AMH	AMJ	AML	AMP	AMV	AMX	HMJ	PAG	PMC	PGA	PGE	PRA	PUB/ PYB	PZA
Configuration 3a	CDL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y1	Y1	N	Y1
	EFL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y1	Y1	N	Y1
	GHL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	JKL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	LML/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	QL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y5	N
	RSL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
Configuration 3b	DEL/R	N	N	N	N	N	Y1	N	N	N	N	N	N	N	N	N	N	N	N	Y1	Y1	N	Y1
	FGL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	HJL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	KLL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	MPL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
	QL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y5	N
	RSL/R	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y
Configuration 4	CC	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y1	N	Y1
	DD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y1	N	Y1
	EE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y1	N	Y1
	FF	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	GG	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	HH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	JJ	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	KK	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	LL	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	MM	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	PP	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	RR	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
	QL/R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y5	N
	SS	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y

Y1: Max. Height 2.44 meters

Y5: See Loading Notes, Position QL and QR

20ft ULD Loading notes:

If 20ft ULDs are loaded over positions **E or J** for configuration **3a**, **E, J or P** for configuration **3b**, they cover the pallet locks of the next position, either forward or aft depending on the exact position of the 20ft ULD. It is then not possible to load 125”/88” or 125”/96” ULDs on the next position – either forward or aft.

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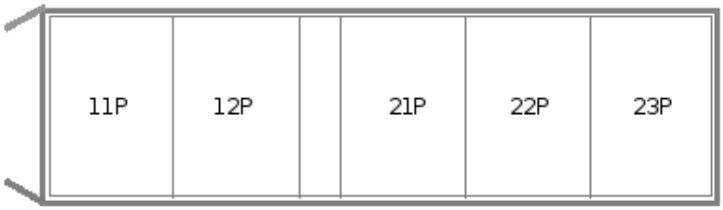
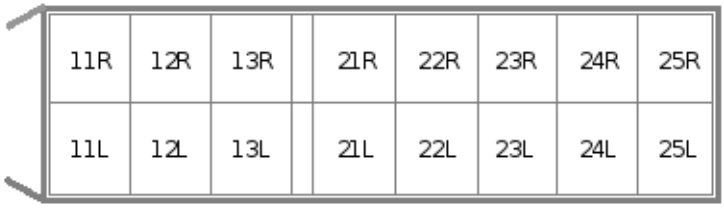
11.3 Lower Deck Configurations

The loading combinations shown here are examples only. More combinations are possible. Full information covering possible loading combinations, and how they interact, can be found in the Sable system.

11.3.1 Forward Hold

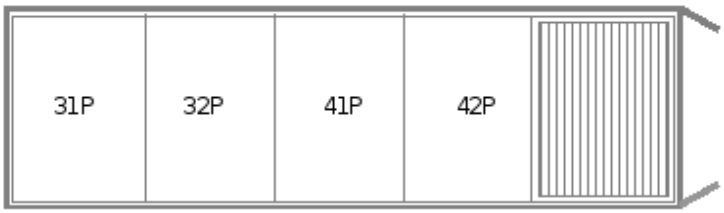


Configuration 1: 5 x 108”/88”, 125”/88” or 125”/96” ULDs

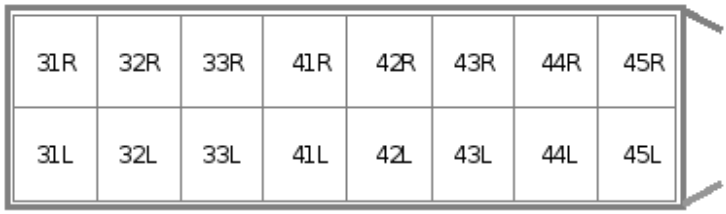


Configuration 2: 8 x 125”/60.4” or 14 x 61.5”/60.4” ULDs

11.3.2 Aft Hold



Configuration 1: 4 x 108”/88”, 125”/88” or 125”/96” ULDs



Configuration 2: 16 x 61.5”/60.4” ULDs

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11.4 Lower Deck ULD Compatibility

The following ULD type loading restrictions apply. The ULD type can be loaded on positions marked with a 'Y'. The ULD type cannot be loaded on positions marked with a 'N'.

		ULD Type											
	Pos	AAJ/ LAK	RAP	AMF	AMP	PAG	PMC	AKE	RKE	RKN	ALF	ALP	PLA/ PLW
FWD Configuration 1	11P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	12P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	13P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	21P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	22P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	23P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
FWD Configuration 2	11R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	12R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	13R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	21R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	22R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	23R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	24R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	25R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
Aft Configuration 1	31P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	32P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	42P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	43P	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
	45L/R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Aft Configuration 2	31R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	32R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	33R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	41R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	42R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	43R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	44R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1
	45R/L	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y1

Y1: Stack loading not allowed

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12. Loading and Un-Loading

12.1 Cargo Loading System

Only fully trained and certified staff are allowed to operate the Cargo Loading System (CLS). The CLS is controlled by the:

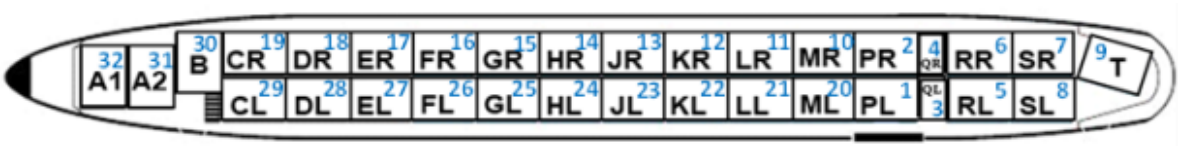
- Master Control Panel (MCP)
- Outside Control Panel (OCP)
- Local Control Panel (LCP)
- 20ft Cargo Control Panel
- Remote Cargo Control Station

Note: A minimum of 2 persons are required to operate the Main-deck CLS. It is recommended that 3 staff members are made available for the Main-deck, to maximise the efficiency of the un-loading and loading process.

12.2 Un-Loading Sequence: Side Cargo Door (SDC)

Step 1: Un-load the aft lower deck.

Step 2: Un-load the ULDs on the main deck in the following numbered sequence.

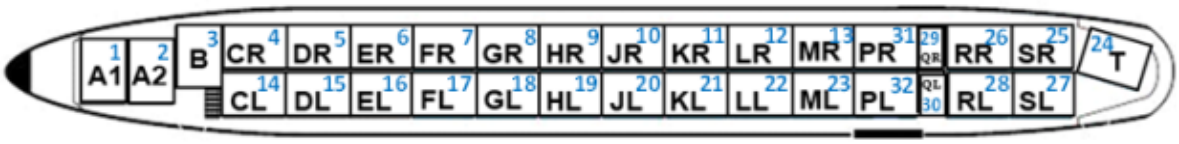


Step 3: Un-load the forward lower deck.

12.3 Loading Sequence: Side Cargo Door (SDC)

Step 1: Load the forward lower deck.

Step 2: Load the ULDs on the main deck in the following numbered sequence.

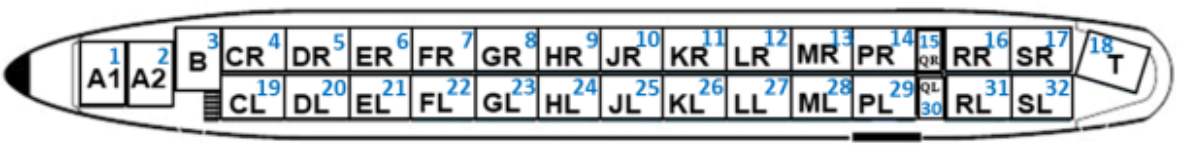


Step 3: Load the aft lower deck.

12.4 Un-loading Sequence: Nose Cargo Door (NCD)

Step 1: Un-load the aft lower deck.

Step 2: Un-load the ULDs on the main deck in the following numbered sequence.



Step 3: Un-load the forward lower deck.

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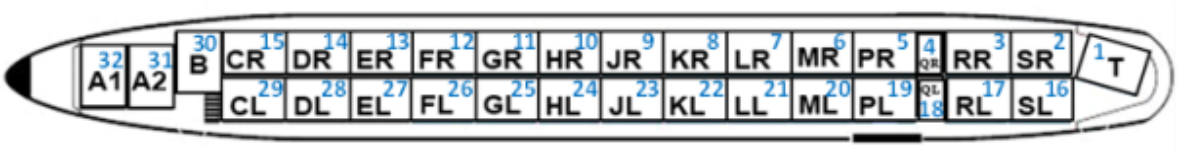
12.5 Loading Sequence: Nose Cargo Door (NCD)

Step 1: Load the forward lower deck.

Step 2: Load the ULDs on the main deck in the following numbered sequence.



Step 3: Load the aft lower deck.

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12.6 Loading Notes

12.6.1 Positions QL and QR

Pallets utilizing positions QR & QL shall be loaded using either an approved Net–and-Pallet combination or shall be restrained directly to the aircraft structure (Strap-to-Aircraft).

Net-and-Pallet combination

Only pallets manufactured by SATCO part number 36437-501 (96” / 55”), in combination with NAS3610-2L3N or NAS3610-2L4N pallet net may be utilised in these positions without requiring additional restraint to the aircraft structure.

The maximum gross weight (MGW) for the 96” / 55” (PYB) pallet is 2,040kg per position. Any load in excess of 2,040kg shall be restrained to the aircraft structure in accordance with the strapping plans outlined below.

There shall be no missing or operative aircraft restraints for those positions.

Strap-to-Aircraft

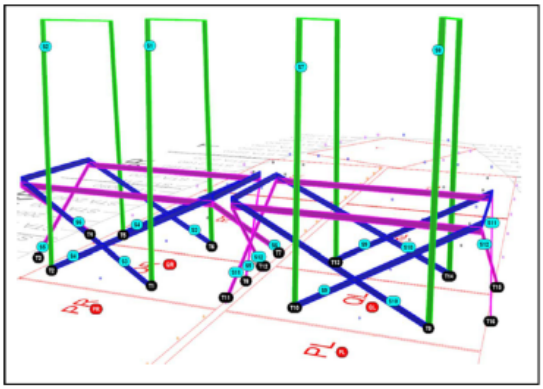
For pallet / pallet net combinations other than those detailed above, or for loads with MGW exceeding 2,024kg, a strap-to-aircraft method shall be utilised.

Either a six (6) or eight (8) strap method shall be used depending on the gross weight of the pallet:

- For pallets with a MGW of 1kg – 1180kg: six (6) straps shall be used
- For pallets with a MGW of 1181kg – 2360kg: eight (8) straps shall be used

When restrained in accordance with either the six (6) or eight (8) strap method as shown below, there is no need for an individual worksheet / tie-down plan to be produced:

Strap-to-aircraft: six (6) straps



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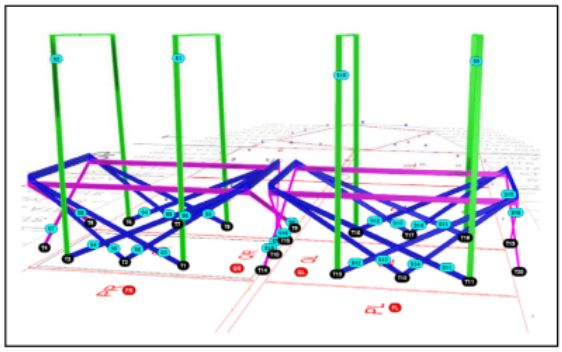
Strap-to-aircraft: eight (8) straps



Utilizing Straps and Pallet net on the same ULD

1) All straps must be completely under the net: and in that case, the straps would provide cargo shift protection and the net would provide primary restraint in all directions, or;
2) All straps must be completely outside the net; and in the case, the straps would need to provide primary restraint in all directions, and the net would provide cargo shift protection.

12.6.2 Additional Precautions

Make sure that two persons verify that all locking devices, securing the ULDs, are engaged and operative.

12.6.3 Tail-Stand

Install tail stand, when available and required, prior to un-loading and/or loading of cargo.

12.6.4 Service point access

All access to outside service points (GPU, ASU, ACU etc) must be done using a ladder due to the height of the fuselage off the ground. Furthermore, due to the downswing of the lower-deck doors, extreme caution must be exercised when opening and closing using a Hi-Lo. **It is strongly recommended that ladders are used to gain access to the lower-deck door open/close access panels.**

12.6.5 Fuel in Centre-tank

Fuel in the **centre-tank** has a positive effect on ground stability. Please check the amount of fuel loaded in the centre-tank with the operating crew or engineer and confirm its impact on centre of gravity.

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13. Rigid, Oversized and Special Loads

For guidance on the handling of special loads, please refer to the Special Loads Regional Contact Instructions outlined in Chapter 6 **6.12.22.3 - Determining Loadability of Special Loads**. Where direct operator approval is required, the Regional Airside Team will liaise with Global Airside as needed.

13.1 Floating / Heavy Pallets

Additional strapping requirements exist for any piece or pallet which requires restraint to be attached directly to the aircraft structure. The restrictions apply for floating pallets and pallets which need to be restrained to the aircraft structure due to the cargo net not being used as the primary restraint.

Any shipment which requires additional restraint shall be notified to the operator at least 24 hours in advance for approval.

The operator shall prepare a strapping plan which shall be implemented by the operators Load Master.

Single pieces weighing 6,000kg or more shall be notified to the operator no less than 24 hours in advance for prior approval.

Full details of the additional strapping requirements shall be found in ON-14-04.

Requests for approval shall be submitted through the Polar/Atlas website as follows:

- Click on the URL: https://www.atlasair.com/cargo-services/special-cargo/
- Click on the link named “Complete Our Form”.

13.2 Tall Rigid Cargo

Tall Rigid cargo which is over 96” (243.8cm) in height shall have frangible (crushable) cargo loaded forward of the rigid cargo, otherwise the cargo must be restrained to 9G.

13.3 Crushable Cargo Requirements

Non-Compressible cargo is only ULDs which are heavier than the standard allowed weights. If no such ULDs are loaded, there is no requirement to load crushable/compressible cargo.

In cases where ULDs heavier than standard maximum weights have been loaded, it is necessary to load Crushable Cargo ULDs suitable for protecting the barrier wall against unrestrained Rigid Cargo in front of the heavy ULDs.

13.3.1 Number of Crushable ULDs required

Load a minimum of 7 ULDs in front of the heavy ULDs.

- For the right loading lane, include positions A1, A2, and B
- For the left loading lane, include position A1 & A2 **but not B**.

The first 4 of these 7 positions must be loaded with Crushable Cargo ULDs suitable for protecting the barrier wall against unrestrained Rigid Cargo.

13.3.2 Gaps and Empty ULDS

Empty ULDs and gaps are allowed anywhere within or in front of non-compressible cargo. However, it can NOT be classified as compressible cargo.

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13.4 Piercing Cargo

Piercing cargo may not be loaded on the first and/or last loaded positions on the aircraft. Piercing Cargo is not allowed on positions A1, SR, SL and T.

13.5 Intermediate Bulk Containers (IBC)

Following general rules apply to IBCs when carrying liquids:

- **Special load code/remark/flagging 'IBC' shall be used. This is needed for load control purposes.**
- IBCs must be built of metal or hard plastic enclosed in a metal frame.
- IBCs are only allowed as a pallet load.
- Top loading is NOT permitted.
- The floor of the pallet must be covered with supporting platforms.
- Distribute IBCs evenly on the pallet.
- Volume max. 1000 liter per IBC.
- Use absorption sheets and plastic foil according to procedures.
- The fill lever per IBC must be a minimum of 80% and a maximum of 95%
- Note that Dangerous Goods as liquids are **not** allowed on IBCs
- ULDs with IBCs must be positioned near the centre of the aircraft and are only allowed on the following positions:
  - Main Deck: E/ F/ G/ H/ J/ K/ L.
  - Lower Deck: 22P/ 23P/ 31P/ 32P.
- If IBCs are loaded the Max. Position Weight must be reduced by 20%.
- Max. 5 IBCs allowed per pallet.
- Max. Allowed Total Gross Weight of all pallets loaded with IBCs on the aircraft is 45 tons.
- All position locks must be serviceable.
- For ULDs with mixed load, the IBC restriction applies

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13.6 Aircraft Engines

The following aircraft engines are loadable on the B747-400 Freighter.

Engine Type	Loaded on	Allowed Loading Positions	Loading direction	Weight distribution for load control	
				Forward position	Aft position
BR710 BR715	96” Pallet	Main deck	Not important	100% on one position	
CF6-50	16ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	40%	60%
			Fan in flight direction	60%	40%
CF8-80C2	16ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	45%	55%
			Fan in flight direction	55%	45%
CFM56-2	96” Pallet	Main deck	Not important	100% on one position	
CFM56-3 CFM56-5 CFM56-7 V2500	16ft or 20ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	40%	60%
			Fan in flight direction	60%	40%
	As exception 96” pallet	Main deck Check height and observe overlap	Fan against flight direction	100% on one position	
GE90 dis-assembled	20ft low profile stand*	FGR – RSR FGL – RSL	TBA	TBA	TBA
				TBA	TBA
JT3 JT8 complete	96” Pallet	Main deck	Not important	100% on one position	
JT3 JT8 Partially assembled (without thrust reverser)	96” Pallet	Main deck	Not important	100% on one position	
		Compartment 1. 2, 3, 4.	Load through the hold door with the exhaust (aft end) of the engine first	100% on one position	
JT9 PW4000	20ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	TBA	TBA
			Fan in flight direction	TBA	TBA
RB211	20ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	40%	60%
Trent 500	20ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	TBA	TBA
			Fan in flight direction	TBA	TBA
Trent 700	20ft Pallet	FGR – RSR FGL – RSL	Fan against flight direction	40%	60%

* Actual loading positions may vary due to maximum allowed position weight differences within the fleet

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13.7 Securing of Vehicles

DHL Wheel Cradle assemblies shall not be used as a primary means of restraint on this aircraft.

13.8 Live Animals

13.8.1 Horses

Max. Number of Horses per Aircraft	Varies dependent on number of horses loaded per box.
Max. Number of Horses per Box	2, 3 or 4 depending on their size.
Max. number of Horses per Groom	PAC/GTI has no requirement for number of grooms required per horse carried, however, a maximum of 3 grooms is allowed per flight.
Approved Horse Transport ULDs	Only IATA, DHL or PAC/GTI approved ULDs are allowed, i.e. HMJ or equivalent.
Approved Loading Configurations	125"/96" Twin-track (Configuration 1) or 125"/96" centre-line (Configuration 2)

Contact bruhubairside@dhl.com for approval to carry horses.

13.8.2 Other Live Animals

The following table provides a list of commonly transported animals. If there is a requirement to transport animals not listed below, contact your Special Loads Regional contact.

<table>
<tr><th></th><th>Main-deck</th><th>Compt. 1</th><th>Compt. 2</th><th>Compt. 3</th><th>Compt. 4</th><th>Compt. 5</th></tr>
<tr><td>Crustaceans or molluscs</td><td rowspan="6">Yes</td><td rowspan="6">Yes</td><td rowspan="6">Yes</td><td rowspan="3">Yes</td><td rowspan="6">Yes</td><td rowspan="6">Yes</td></tr>
<tr><td>Hatching eggs</td></tr>
<tr><td>Tropical fish</td></tr>
<tr><td>Dogs or Cats</td><td rowspan="3">No</td></tr>
<tr><td>Small mammals or birds</td></tr>
<tr><td>Bees</td></tr>
<tr><td>Monkeys</td><td>Yes</td><td>No</td><td>Yes</td><td>No</td><td>44L/R Only</td><td>Yes</td></tr>
<tr><td>Horses</td><td>Yes*</td><td colspan="4" rowspan="2">No</td></tr>
<tr><td>Pigs</td><td>Yes**</td></tr>
<tr><td>Cattle</td><td>Yes**</td><td colspan="4" rowspan="2"></td></tr>
<tr><td>Eels</td><td>Yes</td></tr>
<tr><td>Reptiles or amphibians</td><td>Yes</td><td>11P Only</td><td>No</td><td>No</td><td>44L/R Only</td><td>No</td></tr>
</table>

* Preferably close to the upper-deck stairway on the left loading lane, to provide easy access. Observe maximum number of horses allowed as per Horses.

** Load this type of cargo minimum 2 positions **aft** of smell sensitive cargo.

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14. Restricted Commodities Loading

14.1 Notification to Captain (NOC)

As early as practicable, before departure of the aircraft, but in no case later than when the aircraft moves under its own power, departing stations shall email a copy of the Notification to the Pilot in Command (NOTOC) or the information contain on it, to the next intended destination and to the company's Dispatch Office using the following email address: Notoc@atlasair.com (alternate via fax to +1.786.265.7025

Recommended Format Subject Line: **NOTOC GTI1234 MIA-JFK 14DEC11 N499MC**

14.2 Hazardous Materials Emergency Response

The Company must be informed on any incident / accident in the ramp relevant to the wet lease operation including events before or after hazardous materials have been transported on any Company registered aircraft

Immediate Notification:

ANY INCIDENT INVOLVING DANGEROUS GOODS MUST BE REPORTED IMMEDIATELY TO THE COMPANY's HEADQUARTER BY CALLING +1-914-701-8050

A copy of the Notification to the Pilot in Command shall be made available at reasonable times and locations for distribution to Local Fire and Emergency Departments.

14.3 Reporting of Incidents involving Dangerous Goods

The Company must be informed on any incident / accident relevant to the wet lease operation for which a report is filed with the FAA IAW 49 CFR 171.15 & 171.16.

Accidents/Incidents must be reported to the state of the operator and the state in which they occur, including when undeclared or mis-declared dangerous goods are discovered in cargo.

The Dangerous Goods Authority shall be the primary point of contact when reporting incident to the Company.

14.4 Radioactive (RRY), Magnetised (MAG) and Cargo Aircraft Only (CAO)

The following Dangerous Good type loading restrictions apply. The Dangerous Good type can be loaded on positions marked with a 'Y'. The Dangerous Good type cannot be loaded on positions marked with a 'N'.

	Position												
DG Type	A1,A2	B1	CR/L	DR/L	ER/L	FR/L	GR/L	HR/L	JR/L	K-S R/L	T	FWD LD	AFT LD
MAG	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
RRY (max. 60 TI combined)	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y
RRY (max. 100 TI combined)	N	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
RRY (max. 150 TI combined)	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y
RRY (max. 200 TI combined)	N	N	N	N	N	N	N	N	N	Y	Y	N	Y

14.4.1 MAG Notes

Magnetized Material must be loaded so that headings of aircraft compasses are maintained within the tolerances prescribed by the applicable aircraft airworthiness requirements and, where practical, in locations minimizing possible effects on compasses. Multiple packages may produce a cumulative effect.
All shipments must comply with Packing Instruction 953 (IATA DGR 9.3.9).

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14.4.2 CAO Notes

Packages or overpacks of dangerous goods bearing the “Cargo Aircraft Only” label must be loaded on a cargo aircraft in accordance with one of the following provisions:

- In a Class C aircraft cargo compartment; or
- In a unit load device equipped with a fire detection/suppression system equivalent to that required by the certification requirements of a Class C aircraft cargo compartment as determined by the appropriate national authority; or
- In such a manner that in the event of an emergency involving such packages or overpacks, a crew member or other authorized person can access those packages or overpacks, and can handle and, where size and weight permit, separate such packages from other cargo.
- The following items are exempted from the accessibility requirements:
- Substances of Class 3, Packing Group III, other than those with a subsidiary risk of Class 8
- Toxic substances (Division 6.1) with no subsidiary risk other than Class 3
- Infectious substances (Division 6.2);
- Radioactive materials Class 7
- Miscellaneous dangerous goods Class 9
- Articles of Identification Numbers UN0012, UN0014, or UN0055
- Limited Quantity or Excepted Quantity material

When requested, packages or overpacks bearing the “Cargo Aircraft Only” label should be made available to the crew for inspection prior to departure.

14.4.3 RRY Notes

Limitation of exposure of persons to radiation:

Radioactive material must be segregated sufficiently from workers and from members of the public. All relevant storage personnel must receive such instructions, as are necessary concerning the hazards involved and the precautions to be observed.

Maximum Transport and Criticality Safety Indices:

Each single package on the aircraft has a transport index no greater than 10.0.

The combined transport index of all the packages on the aircraft is no greater than 200, and the combined criticality index of all the packages on the aircraft is no greater than:

- 50 on a non-exclusive use cargo aircraft, or
- 100 on an aircraft assigned for the exclusive use

Contact the Dangerous Goods Authority for additional information and when requesting an approval to operate under exclusive use.

The combined transport index and combined criticality index are determined by adding together the transport index and criticality index numbers, respectively, shown on the labels of the individual packages.

Where the transport index or criticality safety indices of a single package, overpack or freight container exceeds 50, storage and loading must be such as to maintain spacing of 6 m (20 ft.) from other groups of such packages, overpacks or freight containers.

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The following load incompatibilities between AVI, HEG, LHO and FIL in the lower holds and RRY on the main deck apply:

If this special load …	… Is loaded into lower-deck compartment …	… then max TI and allowed main-deck positions are …		
		Max 50.0 TI together on positions	Max 100.0 TI together on positions	Max 200.0 TI together on positions
AVI, HEG, LHO	1	GR/L - T	HR/L-T	KR/L-T
	2	HR/L - T	JR/L-T	KR/L-T
	3	GR/L and RR/L-T	RR/L-T	RR/L-T
	4	GR/L-JR/L and SR/L-T	HR/L and T	**Not allowed**
	5	GR/L-LR/L	HR/L-LR/L	KR/L
FIL	1	GR/L – T	HR/L-T	KR/L-T
	2	JR/L-T	KR/L-T	PR/L-T
	3	RR/L-T	T	**Not allowed**
	4	GR/L-HR/L and T	**Not allowed**	**Not allowed**
	5	GR/L-KR/L	HR/L-JR/L	**Not allowed**

The following load incompatibilities between RRY in the lower holds and AVI, HEG, LHO, FIL in the main deck apply:

If this RRY …	… is loaded into lower-deck compartment …	… then the following main-deck positions are allowed for …	
		AVI, HEG, LHO	FIL
Max 50.0 TI	3	A1-GR/L and RR/L-T	A1-FR/L and RR/L-T
	4	A1-JR/L and SR/L-T	A1-HR/L and TT
Max 100.0 TI	3	A1-GR/L and RR/L-T	A1-FR/L and T
	4	A1-HR/L and T	A1-GR/L
Max 150.0 TI	3	A1-FR/L and RR/L-T	A1-A2
	4	A1-GR/L	A1-DR/L

14.5 Dry Ice

Please see the Global Supplementary Operational Document **Dry Ice Consolidation table** for the current maximum allowed Dry Ice limits.

For Temperature Controlled Containers operating with dry ice as the cooling agent the instructions and procedures for Temperature Controlled Containers as contained in Unit Load Devices and Equipment chapter at the WBM must be followed.

Dry Ice (ICE) and Live Animals (AVI)

There is no weight limit for the loading of Dry Ice (ICE) together with Live Animals (AVI) on the Main-deck

A maximum of 200kg of ICE per lower-deck hold may be carried together with AVI.

Dry Ice and Live Animals may be loaded in the same compartment provided they are separated by a minimum of 3 m (10 ft.). The larger the concentration of dry ice, the greater the distance is required.

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14.6 Lithium Batteries

Please see the Global Supplementary Operational Document **Lithium Battery Loadability Consolidation Table** for the current UN3480 Section IA/IB (RBI), UN3090 Section IA/IB (RBM), UN3481 Section I (RLI), UN3091 Section I (RLM) load ability limits.

14.7 Compressed Oxygen Cylinders

No more than 6 cylinders not exceeding a total combined weight of 75k (165lb) can be loaded into any one aircraft in an inaccessible aircraft cargo compartment(s) that do not have fire or smoke detection systems and fire suppression systems.

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15. Messaging and Reporting

15.1 Messaging

Standard messaging rules apply.

15.2 Reporting

Standard reporting rules apply.

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16. Load Control Data

16.1 Standard Mass Additions

16.1.1 Additional Crew Members (ACM)

Maximum Number of ACMs:	6
Mass of ACM:	110 kg incl. baggage

16.1.2 Fly Away Kit (FAK) and Ballast

FAK is not carried as standard on this aircraft.

Ballast is not carried as standard on this aircraft.

16.2 Minimum Fuel and Standard Taxi Fuel

Minimum Fuel:	30,000 kg
Standard Taxi Fuel:	900 kg

16.3 LMC Restrictions

Maximum Fuel LMC:	Not allowed
Maximum Payload LMC:	+/- 300 kg

Note: LMC for additional crew members is not allowed.

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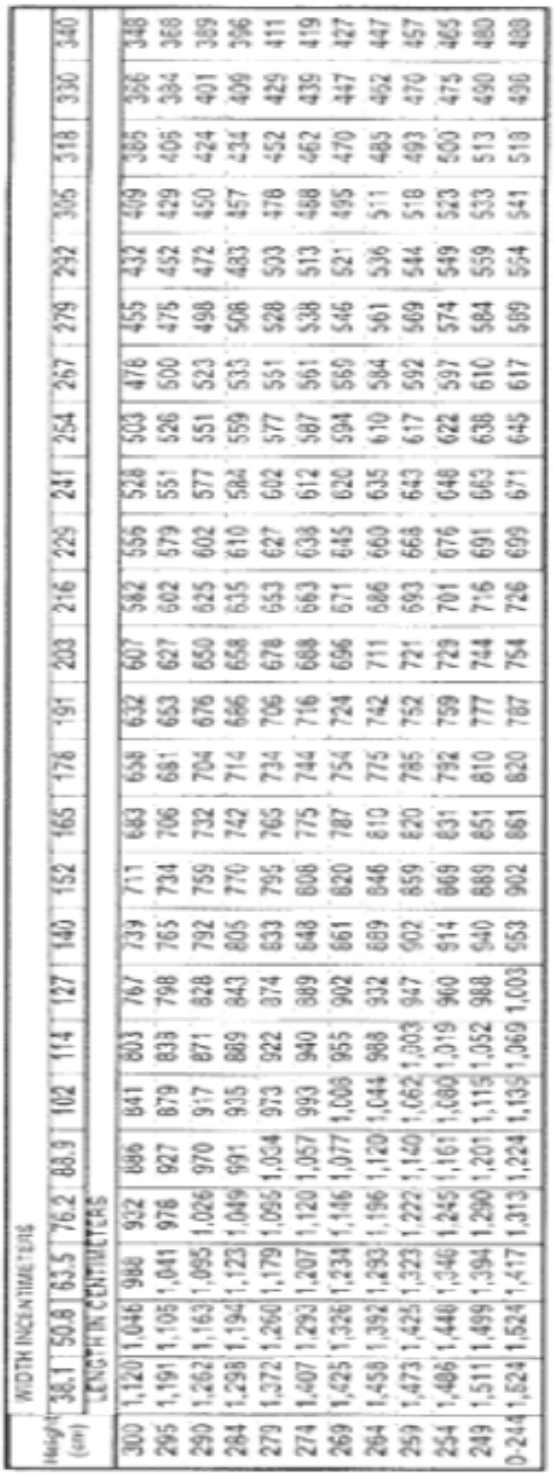
17. Maximum Package Dimensions

17.1 Main Cargo Deck



Height (cm)	WIDTH IN CENTIMETERS																								
	38.1	50.8	63.5	76.2	88.9	102	114	127	140	152	165	178	191	203	216	229	241	254	267	279	292	305	318	330	340
	LENGTH IN CENTIMETERS																								
300	1,120	1,046	988	932	886	841	803	767	739	711	683	658	632	607	582	556	528	503	478	455	432	409	385	366	348
295	1,191	1,105	1,041	978	927	879	838	798	765	734	706	681	653	627	602	579	551	526	500	475	452	429	406	384	368
290	1,262	1,163	1,095	1,026	970	917	871	828	792	759	732	704	676	650	625	602	577	551	523	498	472	450	424	401	389
284	1,298	1,194	1,123	1,049	991	935	889	843	805	770	742	714	686	658	635	610	584	559	533	508	483	457	434	409	396
279	1,372	1,260	1,179	1,095	1,034	973	922	874	833	795	765	734	706	678	653	627	602	577	551	528	503	478	452	429	411
274	1,407	1,293	1,207	1,120	1,057	993	940	889	848	808	775	744	716	688	663	638	612	587	561	538	513	488	462	439	419
269	1,425	1,326	1,234	1,146	1,077	1,008	955	902	861	820	787	754	724	696	671	645	620	594	569	546	521	495	470	447	427
264	1,458	1,392	1,293	1,196	1,120	1,044	988	932	889	846	810	775	742	711	686	660	635	610	584	561	536	511	485	452	447
259	1,473	1,425	1,323	1,222	1,140	1,062	1,003	947	902	859	820	785	752	721	693	668	643	617	592	569	544	518	493	470	457
254	1,486	1,448	1,346	1,245	1,161	1,080	1,019	960	914	869	831	792	759	729	701	676	648	622	597	574	549	523	500	475	465
249	1,511	1,499	1,394	1,290	1,201	1,115	1,052	988	940	889	851	810	777	744	716	691	663	638	610	584	559	533	513	490	480
0-244	1,524	1,524	1,417	1,313	1,224	1,139	1,069	1,003	953	902	861	820	787	754	726	699	671	645	617	589	554	541	518	496	488

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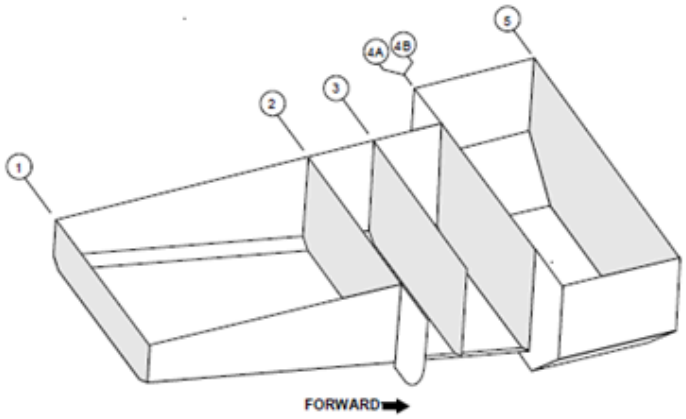
17.2 Bulk Compartment

The figure below illustrates the general layout of the bulk cargo compartment. The numbered labels and shaded panels correspond to the cross-sections provided following the illustration.



CROSS SECTION NO.	B.A. IN.
1	2160.0
2	2040.0
3	2007.0
4A	1980.0
4B	1980.0
5	1920.0

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Allowable Package Sizes with Net Installed at B.A. 1920

The following table is applicable for packages loaded through the large aft cargo door (B.A. 1865.0) with the net installed at B.A. 1920.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1920										
HEIGHT IN.	WIDTH IN.									
	10	20	30	40	50	60	70	80	90	100
	LENGTH IN.									
47	140	140	140	140	140	140	140	140	135	120
43	155	155	155	155	155	155	155	145	135	120
39	180	180	180	180	180	175	155	145	135	120
36	200	200	200	200	180	175	160	145	135	120
32	230	230	230	230	205	180	160	145	135	120
24-28	235	235	235	235	215	180	160	145	135	120
4-20	240	240	240	240	215	180	160	145	135	120

The following table is applicable for packages loaded through the bulk cargo door (B.A. 2007.0 IN.) with the net installed at B.A. 1920.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1920											
HEIGHT IN.	WIDTH IN.										
	4	8	12	16	20	24	28	32	36	40	44
	LENGTH IN.										
47	140	140	140	132	126	121	117	114	110	108	108
43	160	160	155	145	140	135	130	125	120	115	110
39	180	165	155	150	140	135	130	125	120	120	120[a]
36	185	170	160	150	145	135	130	125	120	120[a]	120[a]
32	190	175	165	155	150	140	135	130	125[a]	120[a]	120[a]
28	200	185	170	160	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
24	220	190	175	165	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
20	220	195	180	170	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
16	230	205	190	175	160	150	140	135[a]	125[a]	120[a]	120[a]
12	235	220	200	180	165	155	145	135[a]	130[a]	125[a]	120[a]
8	235	235	215	195	175	160	150	140	130[a]	125[a]	120[a]
4	235	235	225	210	185	170	155	145	135[a]	125[a]	120[a]

[a] Package loaded aft of the door.

The following table is applicable for tilted[1] packages loaded forward of the bulk cargo door (B.A. 2007.0 IN.) with the net installed at B.A. 1920.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1920											
HEIGHT IN.	WIDTH IN.										
	4	8	12	16	20	24	28	32	36	40	44
	LENGTH IN.										
64	108	108									
60	108	108	108								
56	108	108	108	108							
52	108	108	108	108	108						
48	140	140	140	132	126	121	117	114	110	108	108

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Allowable Package Sizes with Net Installed at B.A. 1980

The following table is applicable for packages loaded through the large aft cargo door (B.A. 1865.0) with the net installed at B.A. 1980.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1980										
HEIGHT IN.	WIDTH IN.									
	10	20	30	40	50	60	70	80	90	100
	LENGTH IN.									
47	95	95	95	95	95	95	95	80	73	67
43	114	114	114	114	114	114	114	80	73	67
39	133	133	133	133	133	133	133	80	73	67
36	148	148	148	148	148	148	148	80	73	67
32	166	166	166	166	166	166	160	80	73	67
4-28	180	180	180	180	180	180	160	80	73	67

The following table is applicable for packages loaded through the bulk cargo door (B.A. 2007.0 IN.) with the net installed at B.A. 1920.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1980											
HEIGHT IN.	WIDTH IN.										
	4	8	12	16	20	24	28	32	36	40	44
	LENGTH IN.										
47	95	95	95	95	95	95	95	95	95	95	95
43	114	114	114	114	114	114	114	114	114	114	110
39	133	133	133	133	133	133	130	125	120	120	120[a]
36	148	148	148	148	145	135	130	125	120	120[a]	120[a]
32	166	166	165	155	150	140	135	130	125[a]	120[a]	120[a]
28	175	175	175	160	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
24	175	175	175	165	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
20	175	175	175	170	155	145	135[a]	130[a]	125[a]	120[a]	120[a]
16	175	175	175	175	160	150	140	135[a]	125[a]	120[a]	120[a]
12	175	175	175	175	165	155	145	135[a]	130[a]	125[a]	120[a]
8	175	175	175	175	175	160	150	140	130[a]	125[a]	120[a]
4	175	175	175	175	175	170	155	145	135[a]	125[a]	120[a]

[a] Package loaded aft of the door.

The following table is applicable for tilted[1] packages loaded forward of the bulk cargo door (B.A. 2007.0 IN.) with the net installed at B.A. 1920.0.

BULK COMPARTMENT ALLOWABLE PACKAGE SIZES - NET AT B.A. 1980											
HEIGHT IN.	WIDTH IN.										
	4	8	12	16	20	24	28	32	36	40	44
	LENGTH IN.										
56	46	46	46	46							
52	68	68	68	68	68						
48	90	90	90	90	90	90	90	90	90	90	90

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