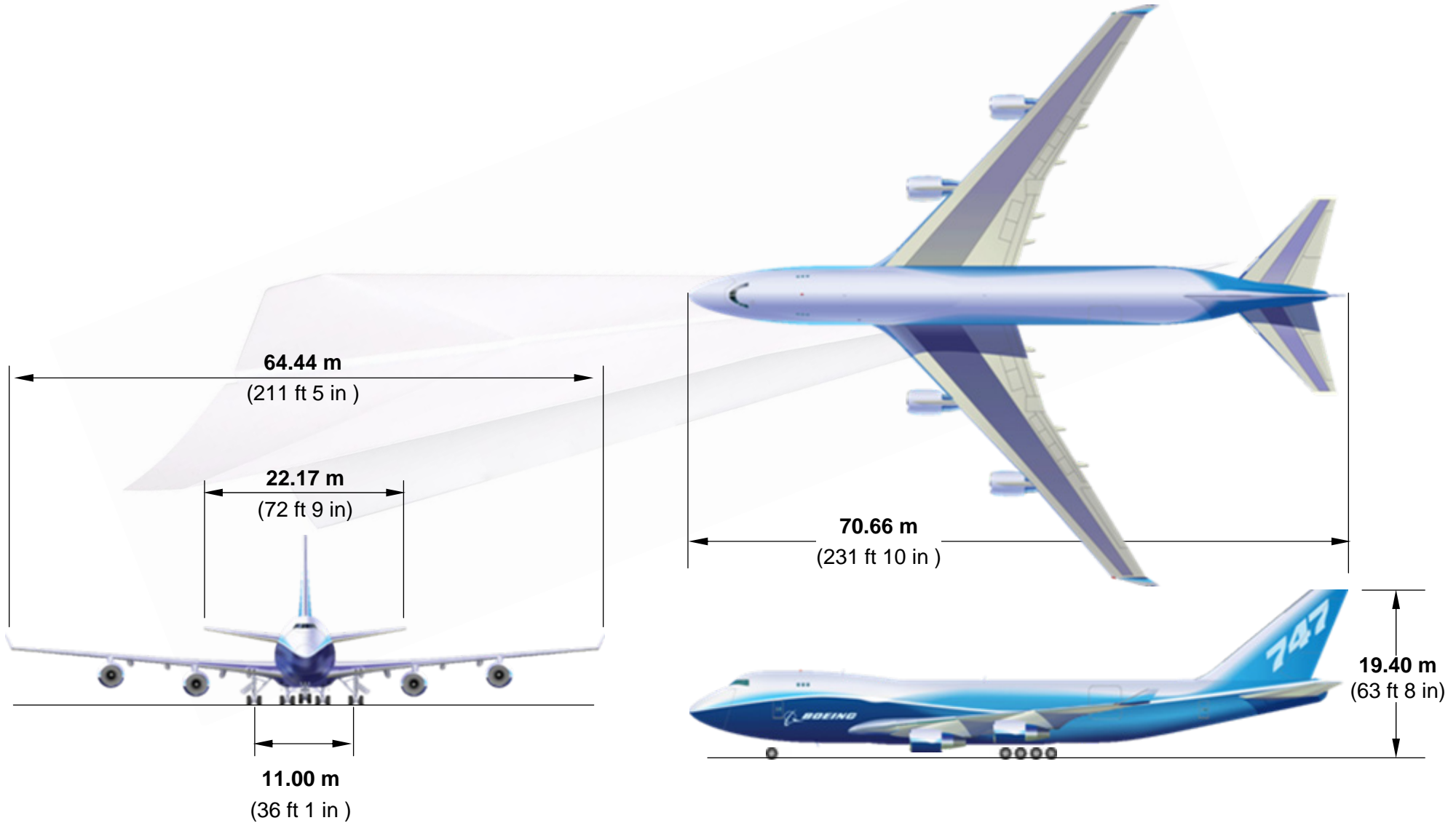


747-400/-400ER Freighters

StartupBoeing

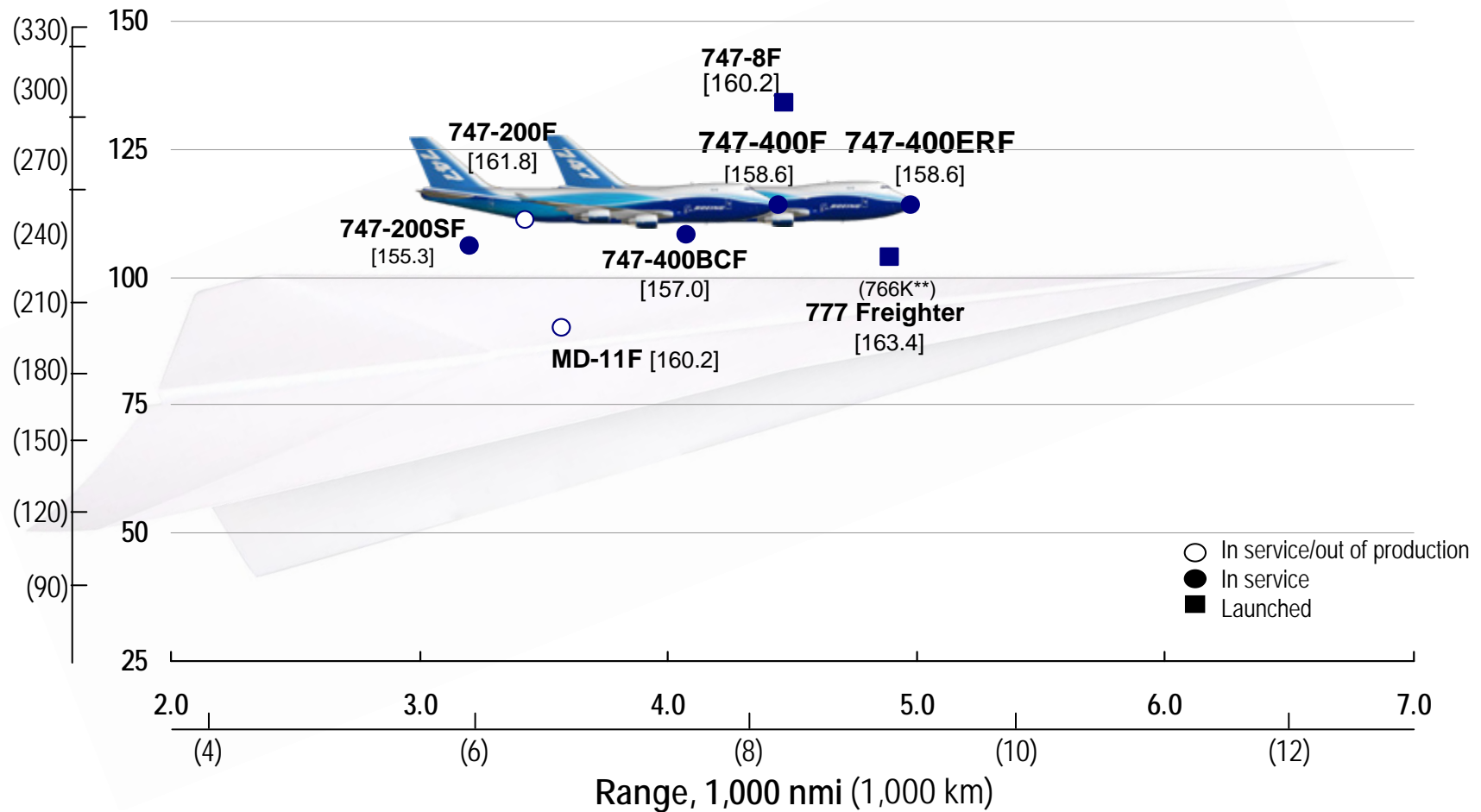


747-400/-400ER Freighter

Part of a complete Boeing freighter solution

StartupBoeing

Revenue payload, 1,000 kg (1,000 lb)



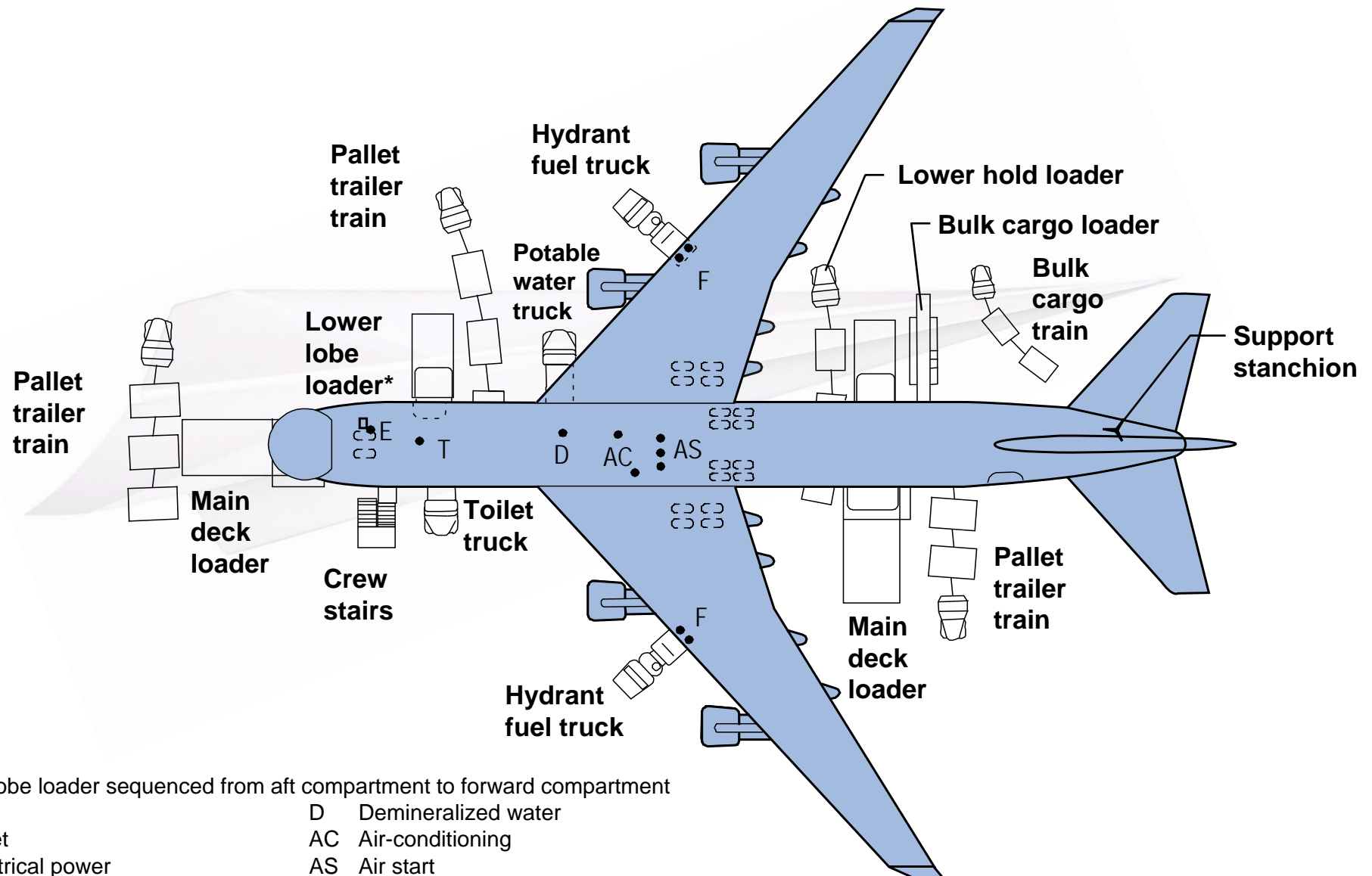
- Revenue payload = structural payload MZFW - (OEW + tare)
- [] = average density, kg/m³, for total volume excluding bulk

* Boeing Assessment
 ** Restricted loadability

747-400/-400ER Freighter

Servicing arrangement, open ramp operation

StartupBoeing



*Lower lobe loader sequenced from aft compartment to forward compartment

F Fuel

T Toilet

E Electrical power

D Demineralized water

AC Air-conditioning

AS Air start

747-400/-400ER Freighter

Nose door adds tremendous value

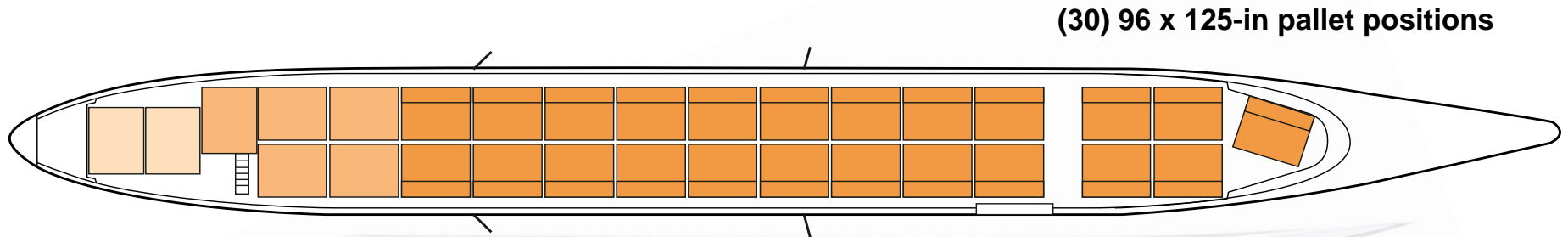
StartupBoeing



747-400 Freighter

Main deck cargo arrangements

StartupBoeing

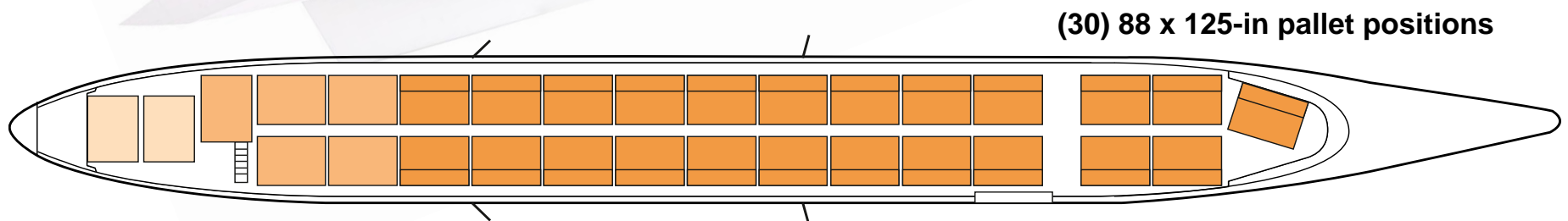


(2) 96 x 125-in x 8-ft contoured pallets at 15.3 m³ and 17.2 m³ (540 ft³ and 607 ft³)

(5) 96 x 125-in x 8-ft pallets at 17.4 m³ (613 ft³)

(23) 96 x 125-in x 10-ft contoured pallets at 21.2 m³ (750 ft³)

Total 607.7 m³ 21,462 ft³



(2) 88 x 125-in x 8-ft contoured pallets at 13.9 m³ and 15.7 m³ (493 ft³ and 554 ft³)

(5) 88 x 125-in x 8-ft pallets at 15.9 m³ (560 ft³)

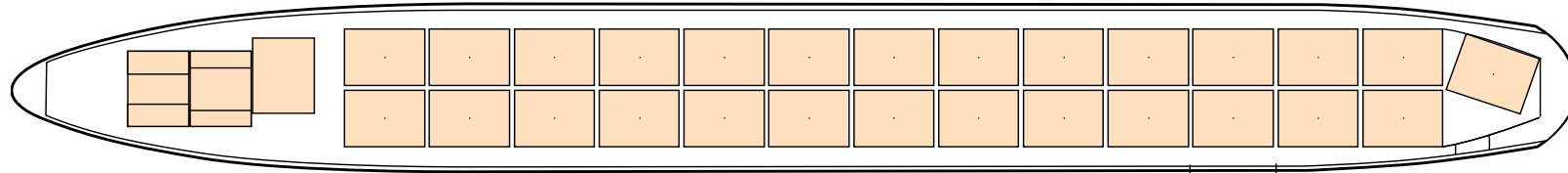
(23) 88 x 125-in x 10-ft contoured pallets at 19.3 m³ (680 ft³)

Total 553 m³ 19,487 ft³

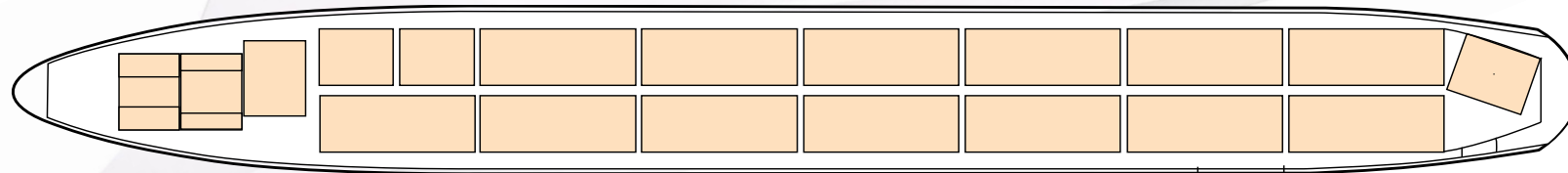
747-400/-400ER Freighter

Nose door loading

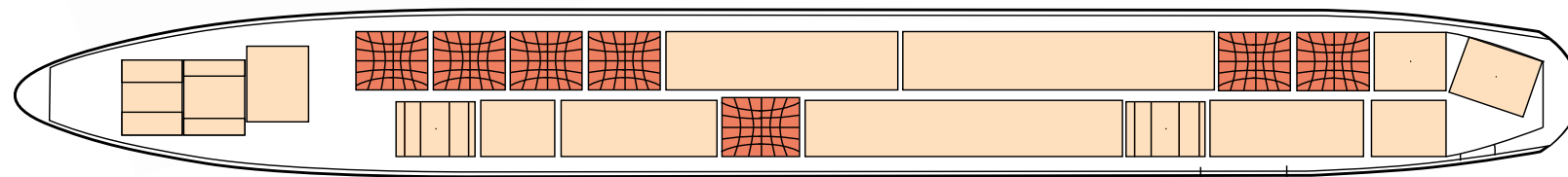
StartupBoeing



(29) 10-ft (3-m) containers



**(13) 20-ft (6-m) intermodal containers
(5) 10-ft (3-m) containers**

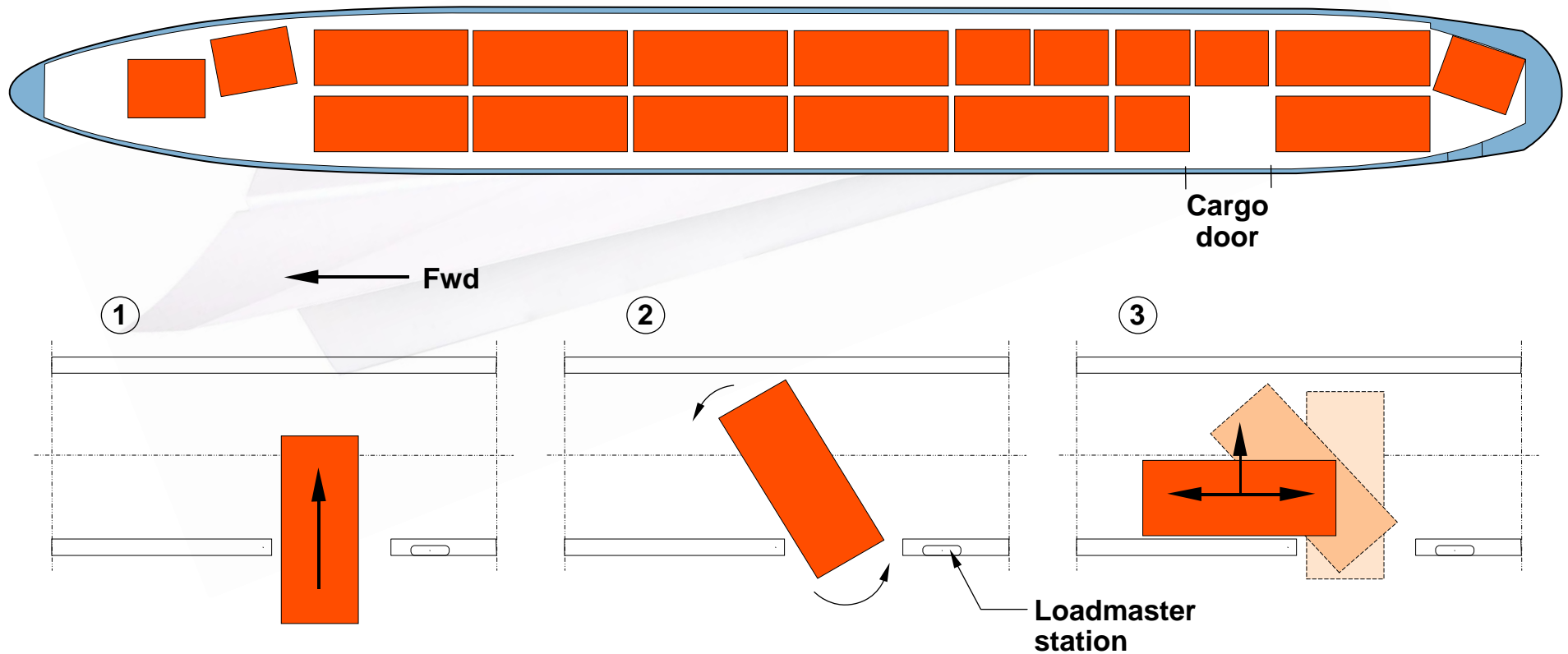


Random intermix, 10-, 20-, 30-, and 40-ft (3-, 6-, 9-, and 12-m) loads

747-400/-400ER Freighter

StartupBoeing

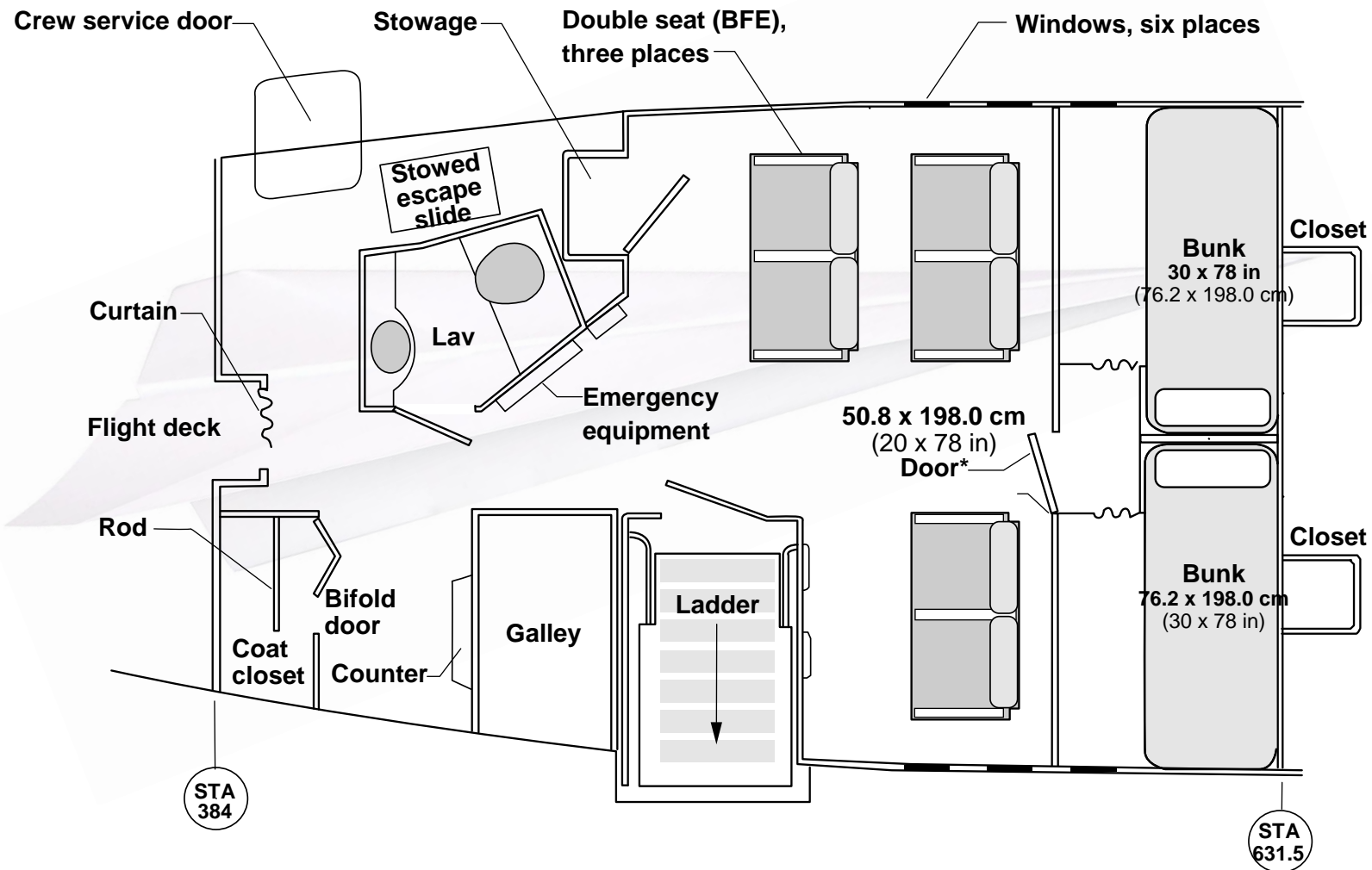
Side cargo door loading 6-meter (20-foot) container



747-400/-400ER Freighter

Upper deck arrangement

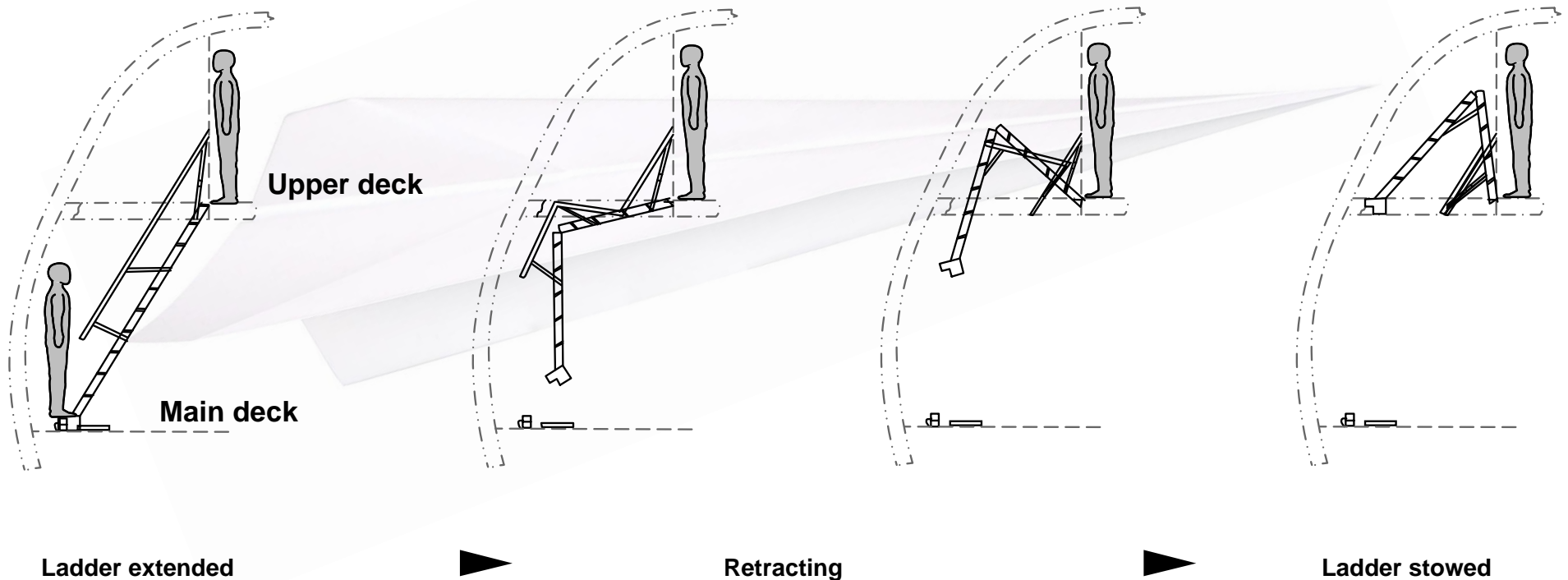
StartupBoeing



747-400/-400ER Freighter

Upper deck ladder operation

StartupBoeing

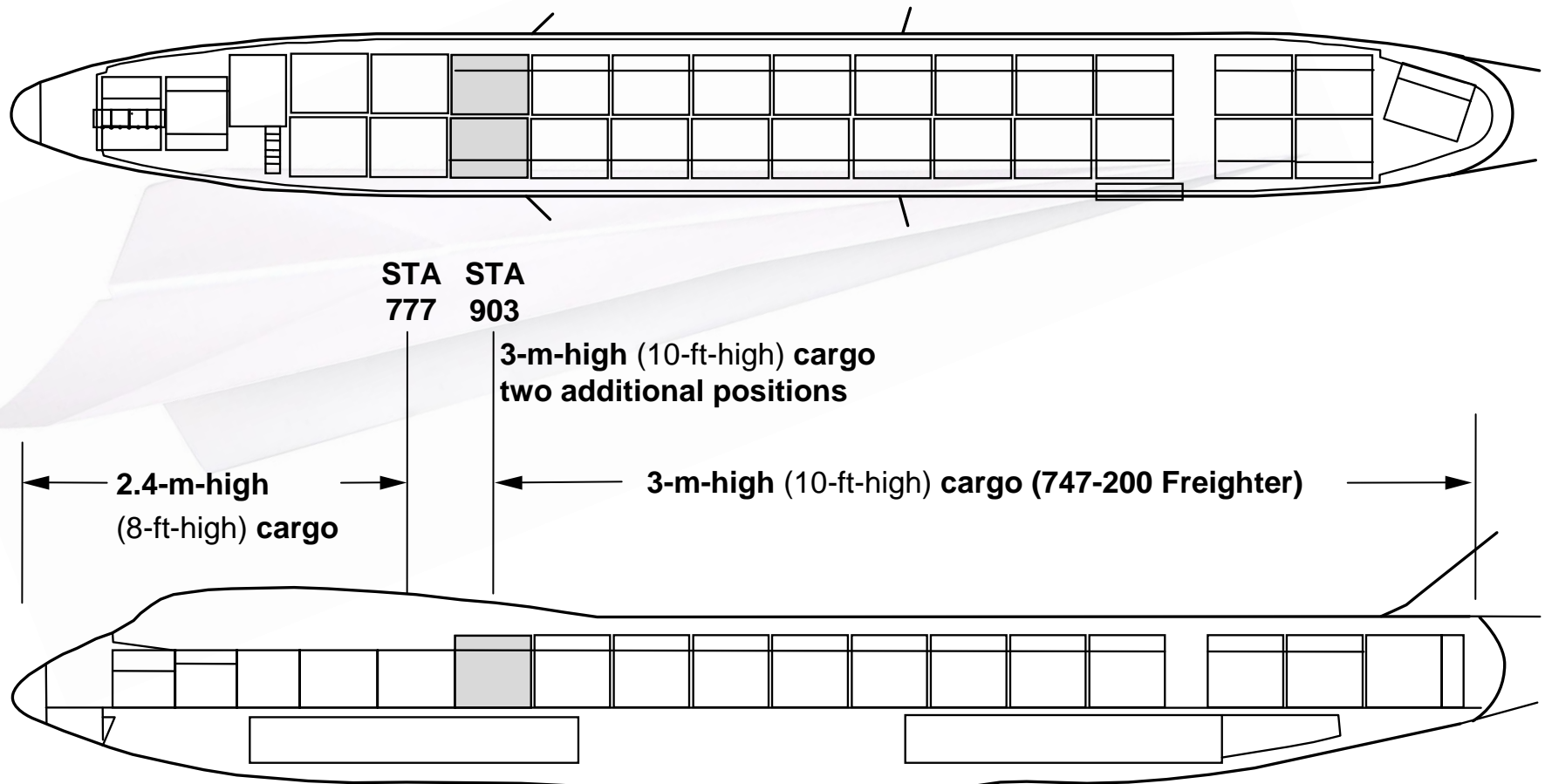


747-400/-400ER Freighter

StartupBoeing

Additional 10-foot-high cargo capacity

6.8 m³ (240 ft³) more cargo volume than the 747-200

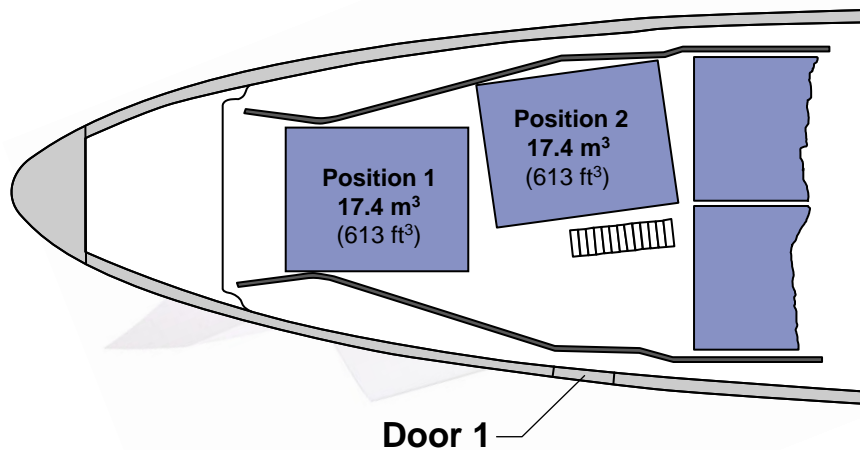


747-400/-400ER Freighter

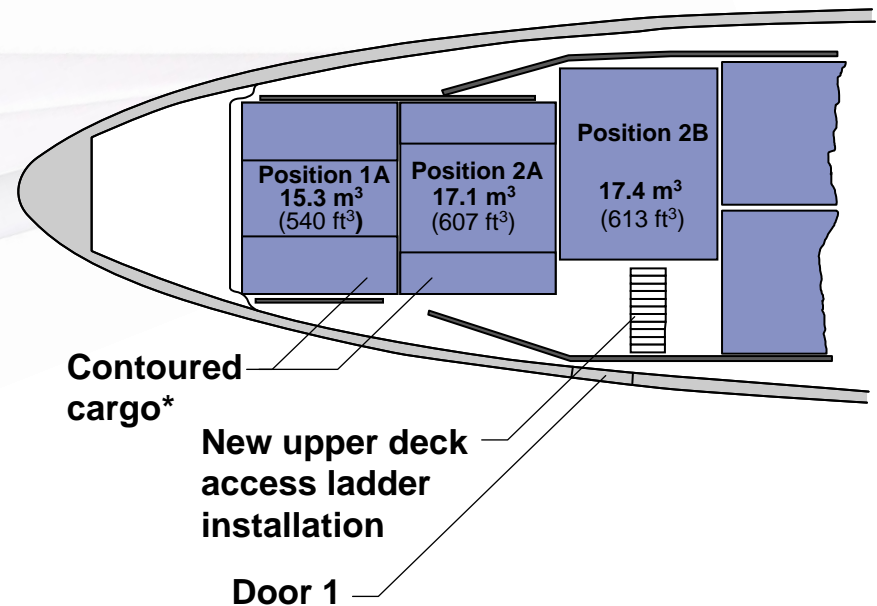
Additional main deck pallet

StartupBoeing

747-200 Freighter
Existing positions P1, P2



747-400 Freighters



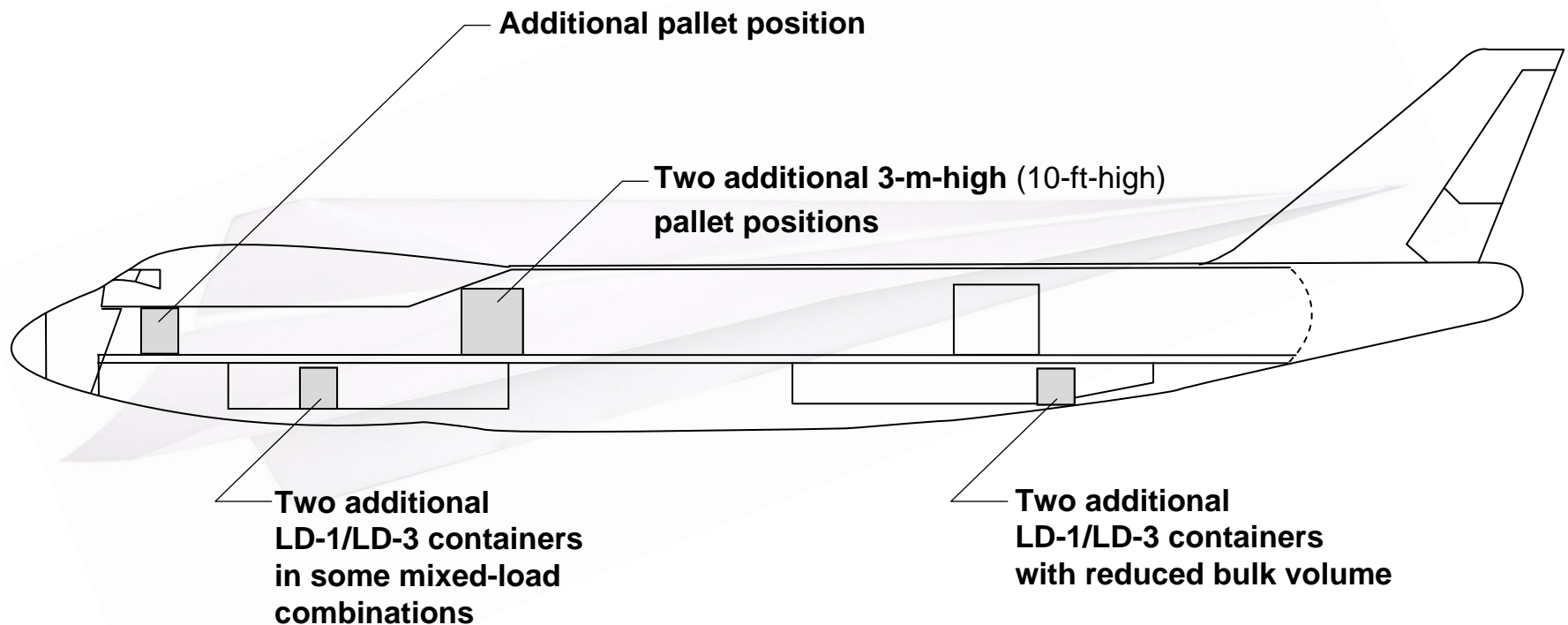
More than 15.1-m³ (534-ft³) volume increase (one additional pallet)

*Position 2A can be a full container (uncontoured) when loaded through the side cargo door.

747-400/-400ER Freighter

Additional cargo volume capability

StartupBoeing

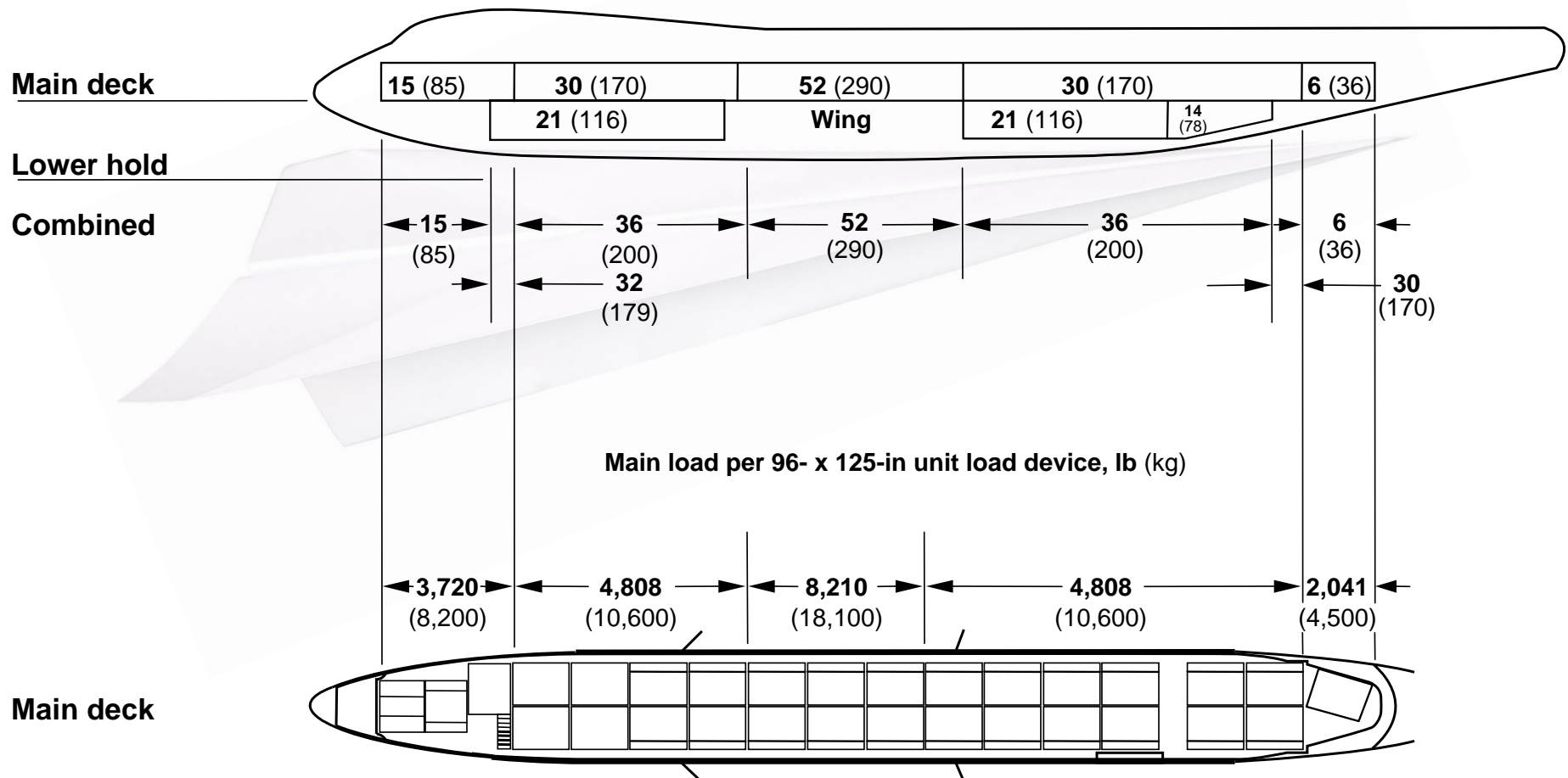


The 747-400 Freighters have 21.9 m³ (774 ft³) more main deck volume and up to 11.9 m³ (420 ft³) more lower hold volume than the 747-200 Freighter

747-400/-400ER Freighter

Structural loading limits

Running load capability, kg/cm (lb/in)



747-400/-400ER Freighter

Unmatched freight flexibility

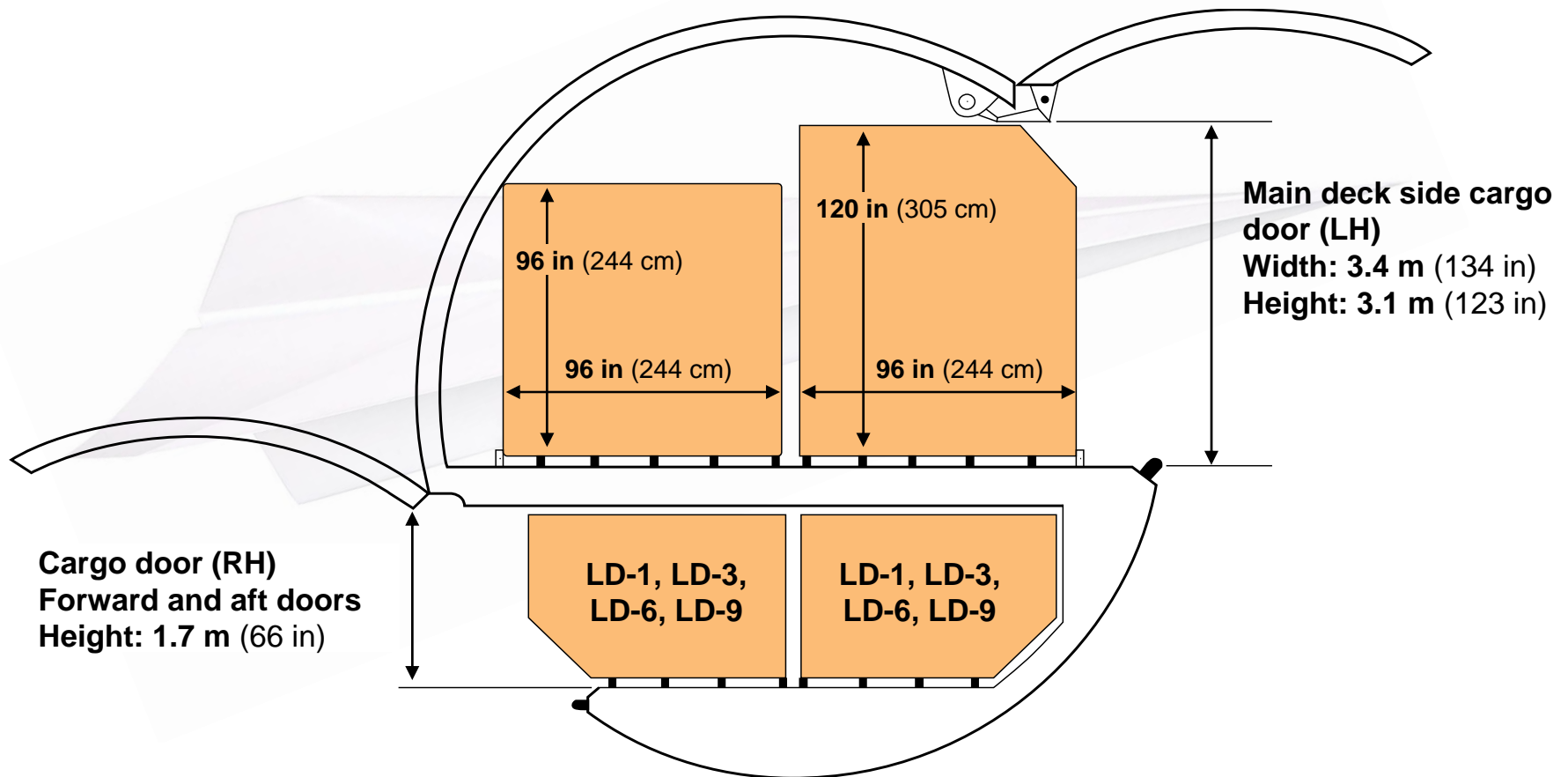
StartupBoeing



747-400/-400ER Freighters

Cross section

StartupBoeing



747-400/-400ER Freighter

StartupBoeing



747-400/-400ER Freighter

3 meter (10 foot) cargo capability

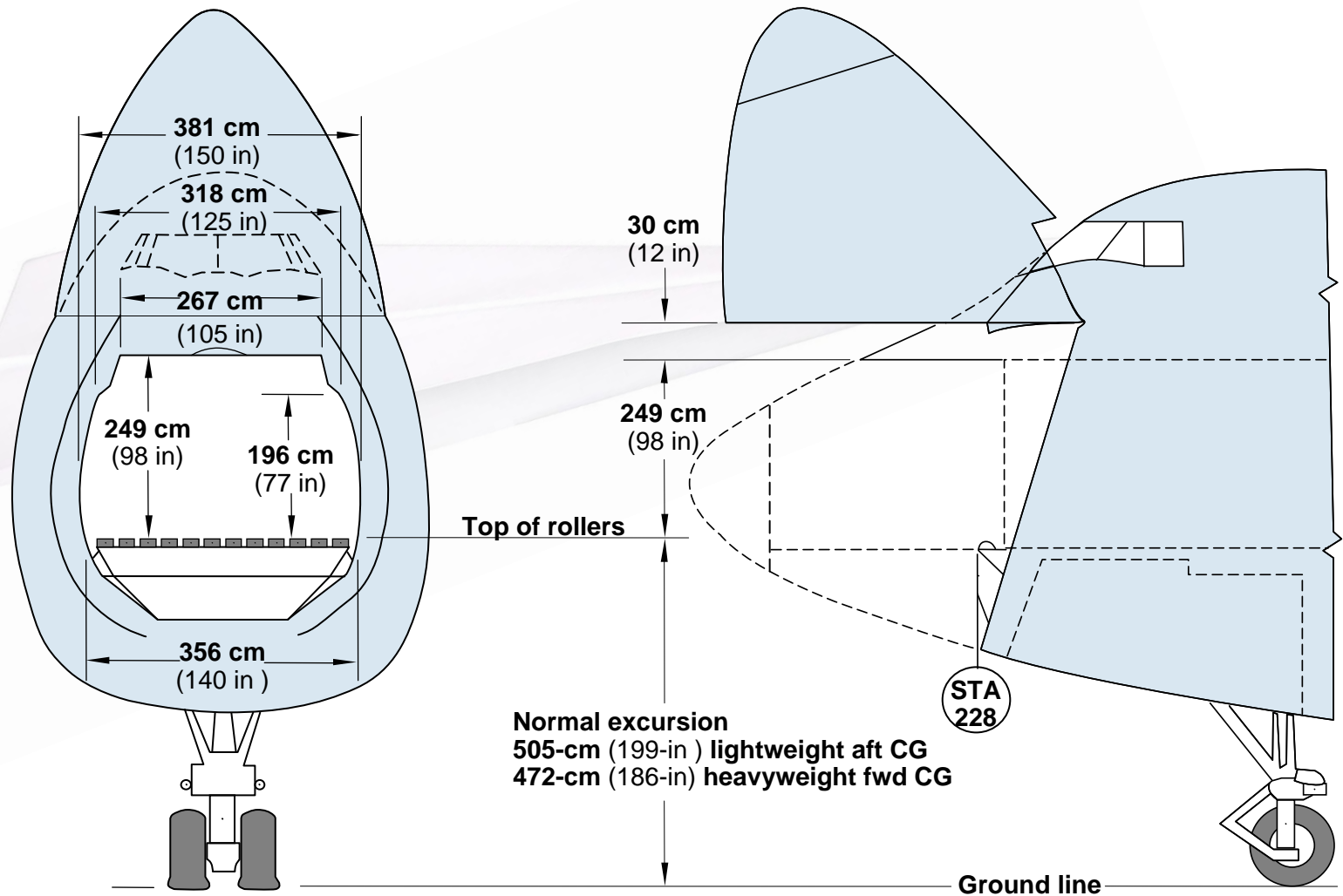
StartupBoeing



747-400/-400ER Freighter

Nose cargo door

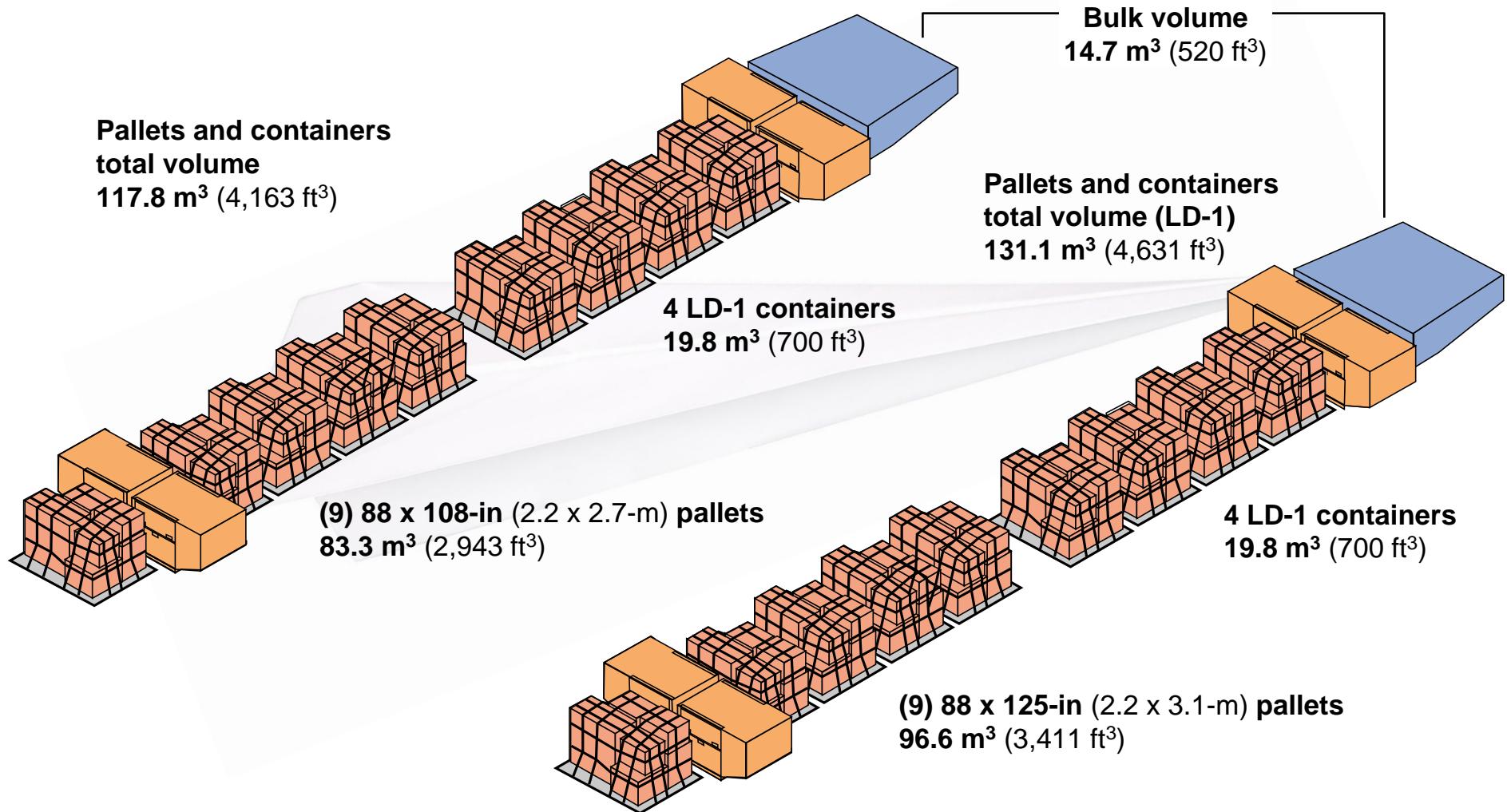
StartupBoeing



747-400/-400ER Freighter

Lower hold cargo arrangements

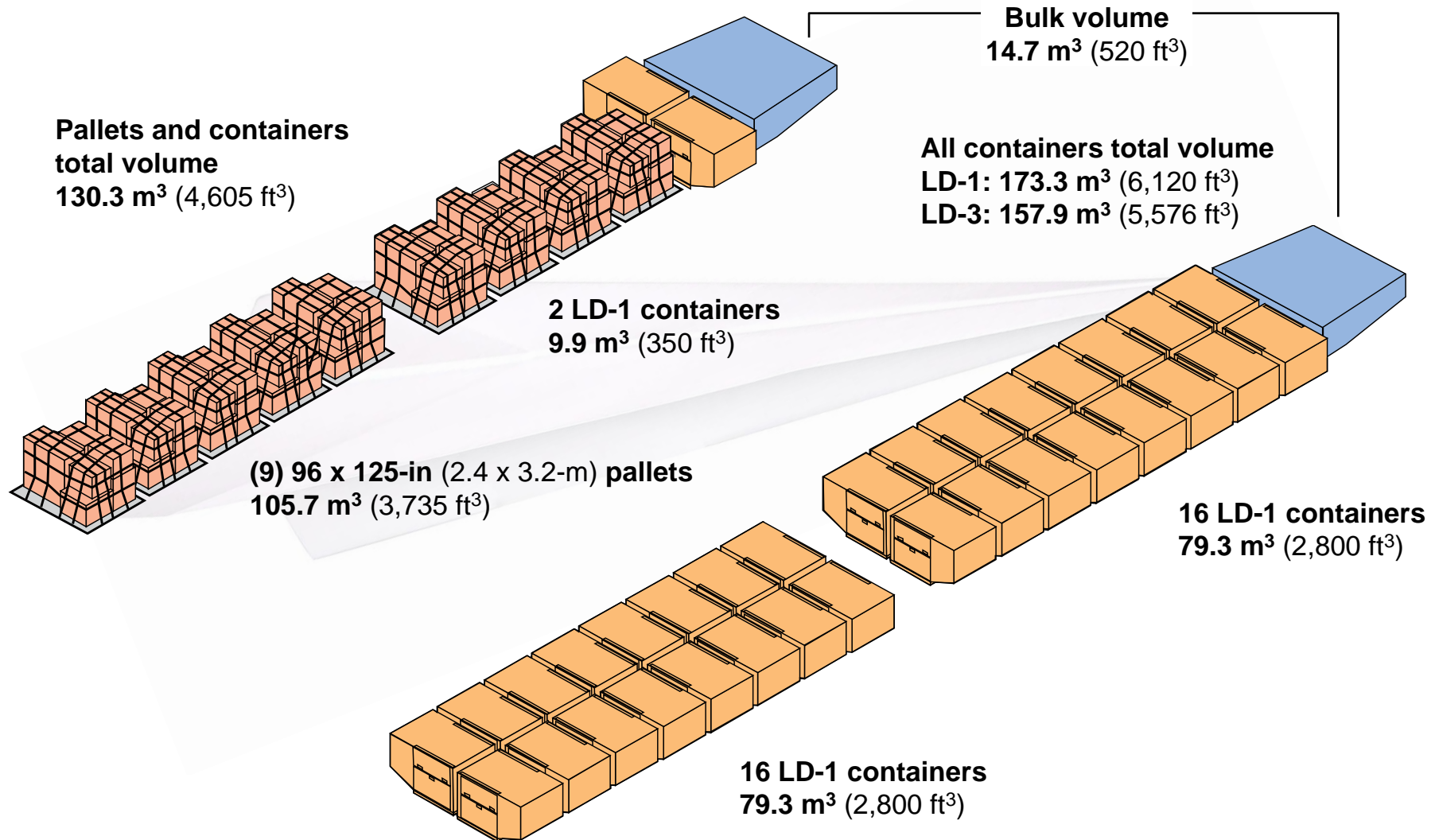
StartupBoeing



747-400/-400ER Freighter

Lower hold cargo arrangements

StartupBoeing



747-400/-400ER Freighter

Lower hold volume arrangements

StartupBoeing

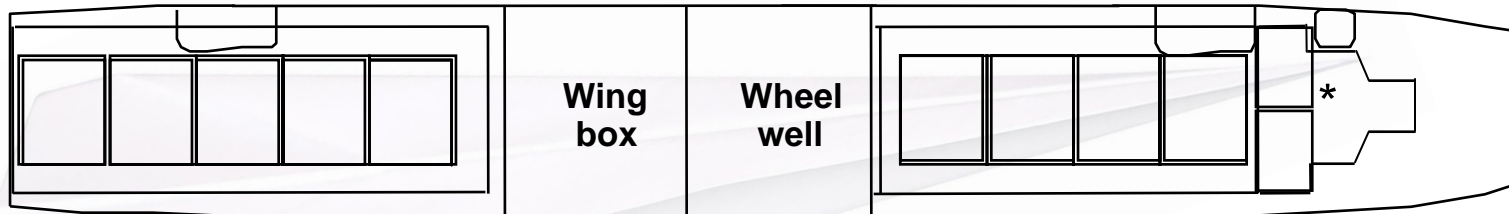
747-400F/ERF

Forward lower hold

Aft lower hold

Pallets and Containers

Total Volume
115.7 m³ (4,085 ft³)

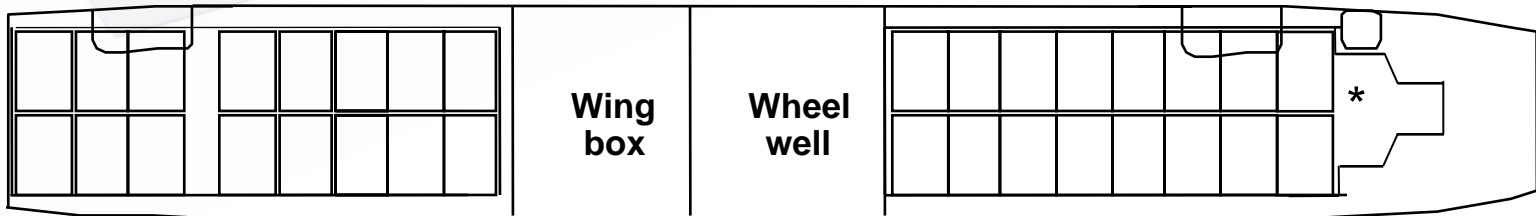


(5) 96-in x 125-in pallets
58.8 m³ (2,075 ft³)

(4) 96-in x 125-in pallets + (2) LD-1/LD-3 containers
56.9 m³ (2,010 ft³)

All Containers

Total Volume
158.6 m³ (5,600 ft³)



(16) LD-1/LD-3 containers
79.3 m³ (2,800 ft³)

(16) LD-1/LD-3 containers
79.3 m³ (2,800 ft³)

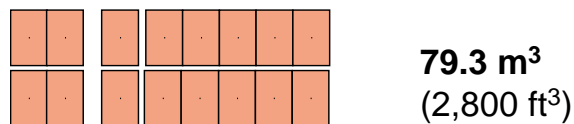
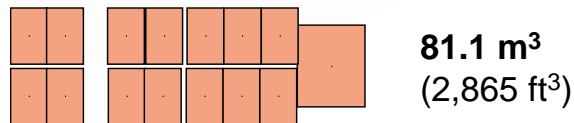
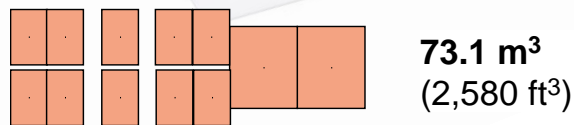
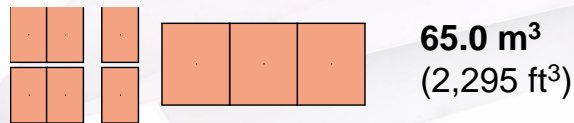
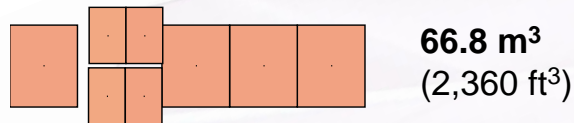
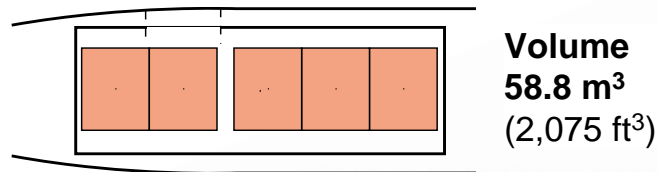
*Bulk cargo = 23.6 m³ (520 ft³).

747-400/-400ER Freighter

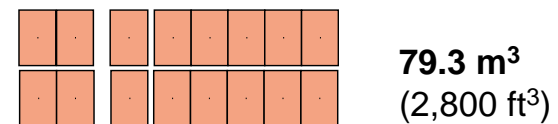
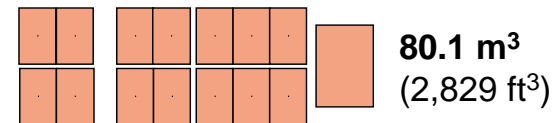
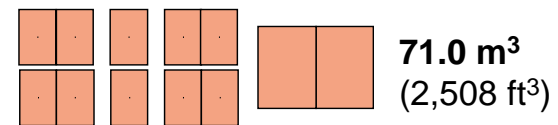
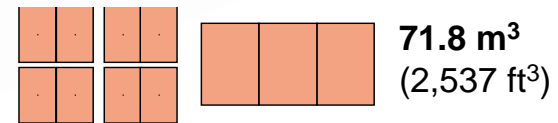
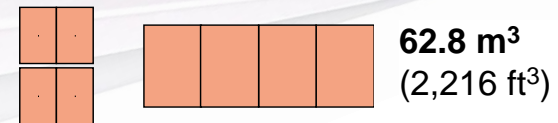
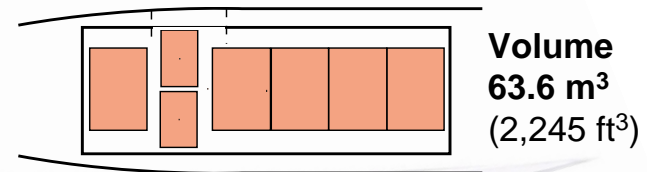
Lower hold loading versatility

StartupBoeing

96-in pallets, 11.8 m³ (415 ft³) volume
LD-1, 4.9 m³ (175 ft³) volume



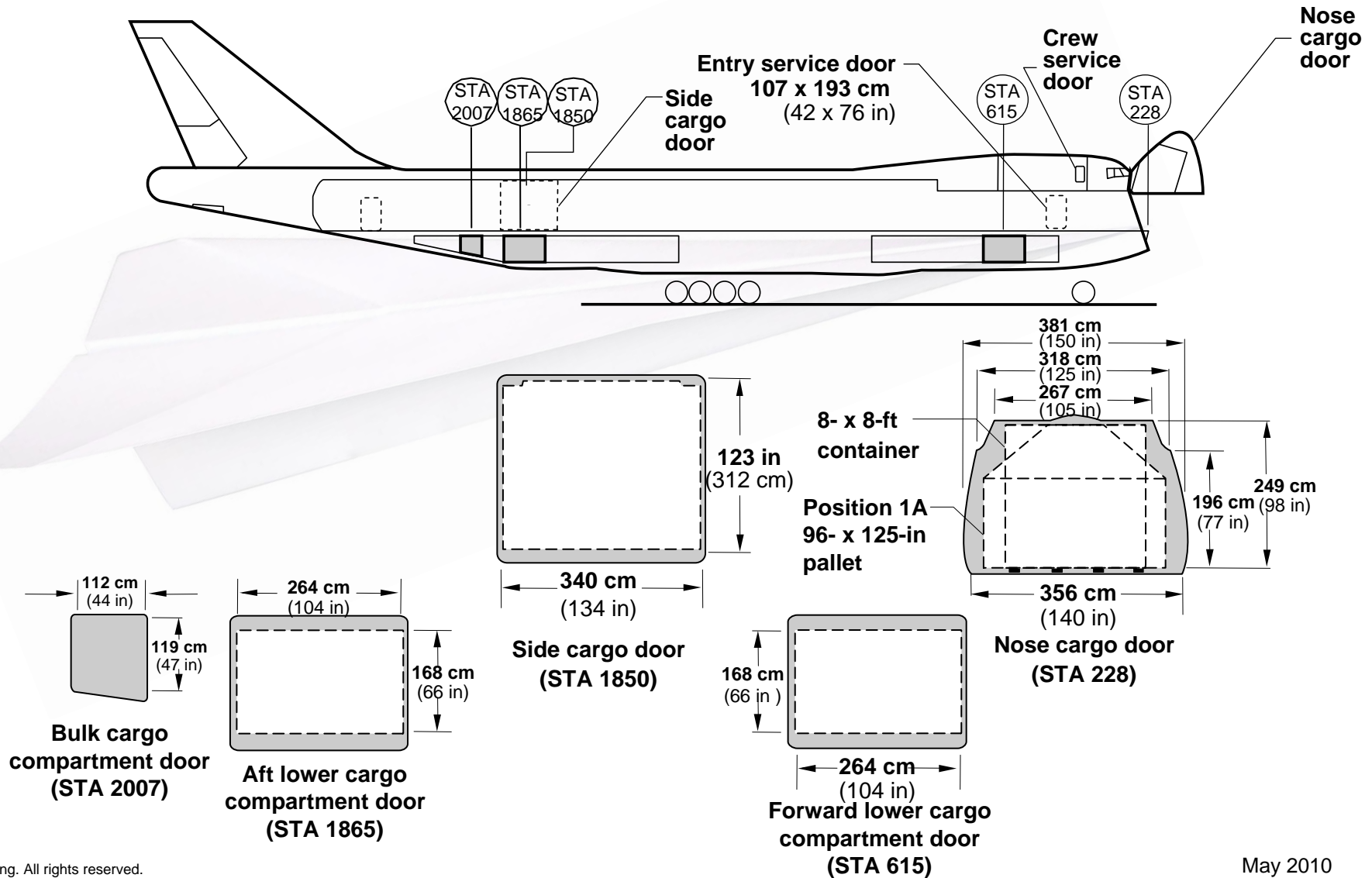
88-in pallets, 10.7 m³ (379 ft³) volume
LD-1, 4.9 m³ (175 ft³) volume



747-400/-400ER Freighter

Cargo door arrangement

StartupBoeing

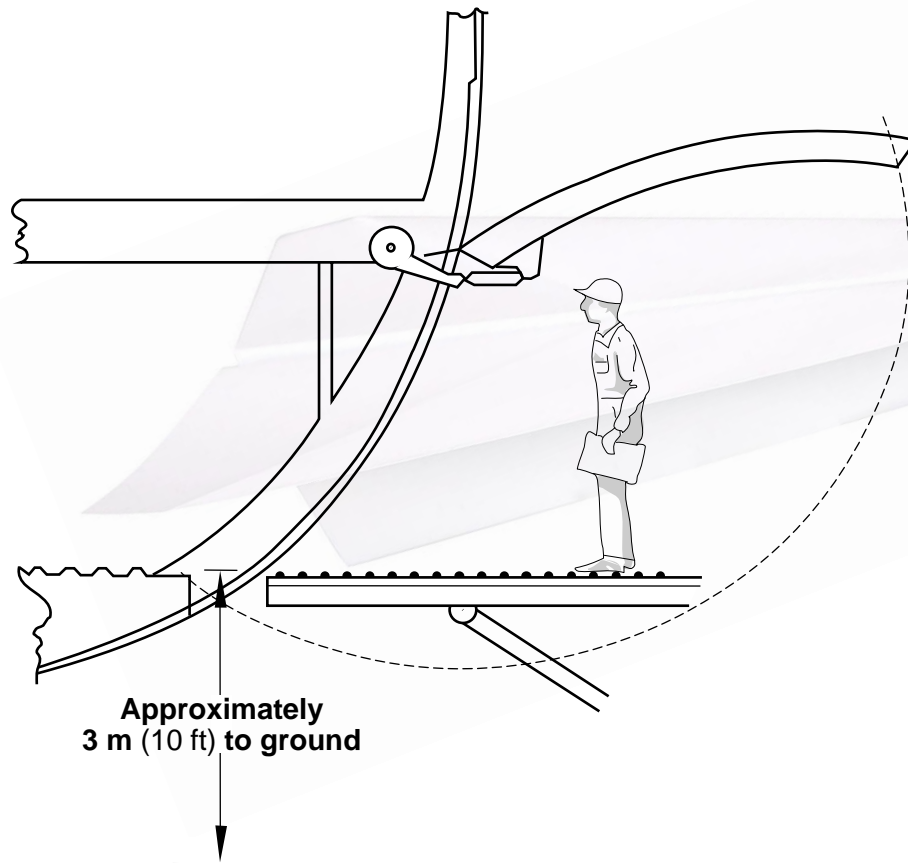


747-400/-400ER Freighter

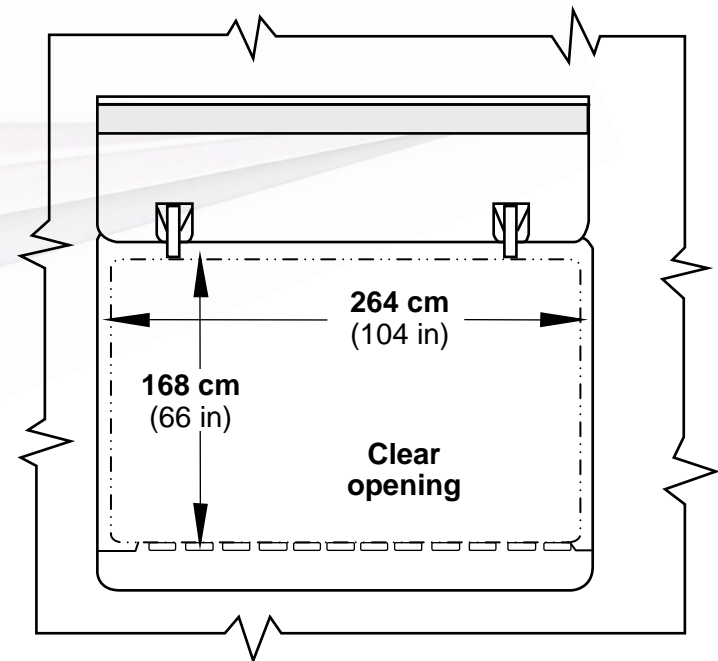
Lower cargo compartment door

StartupBoeing

Rear view



Right-hand side view



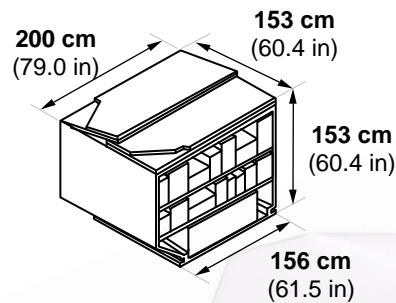
747-400/-400ER Freighter

Lower hold capability

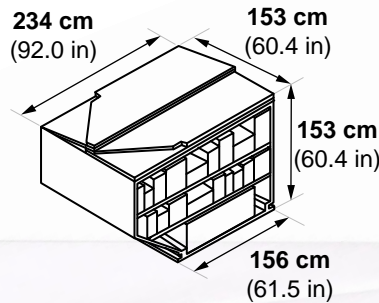
StartupBoeing

Containers and pallets

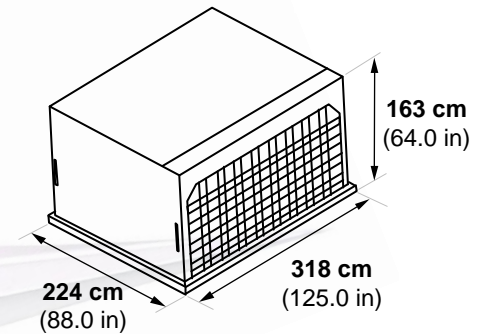
Basic



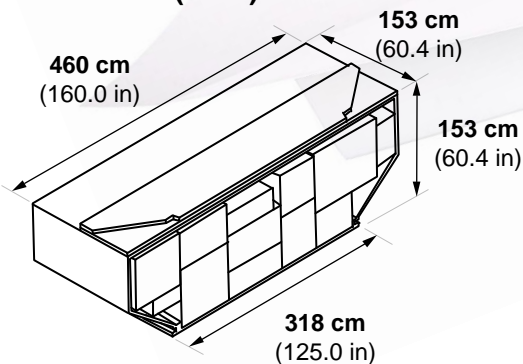
1,588-kg (3,500-lb) MGW
4.5 m³ (159 ft³)
(LD-3)



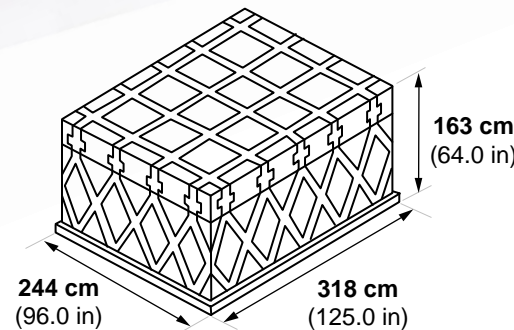
1,588-kg (3,500-lb) MGW
4.9 m³ (175 ft³)
(LD-1)



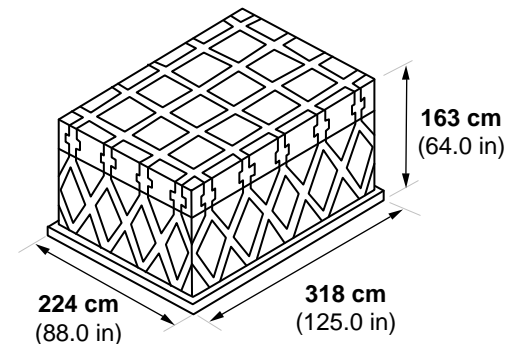
4,627-kg (10,200-lb) MGW*
10.8 m³ (381 ft³)
(LD-9)



3,175-kg (7,000-lb) MGW*
9.1 m³ (322 ft³)
(LD-6)



5,035-kg (11,100-lb) MGW*
11.8 m³ (415 ft³)



4,627-kg (10,200-lb) MGW*
10.5 m³ (372 ft³)

* Maximum gross weights shown are based on lower hold running load capability, 21 kg/cm (116 lb/in), subject to overall airframe structural limits.

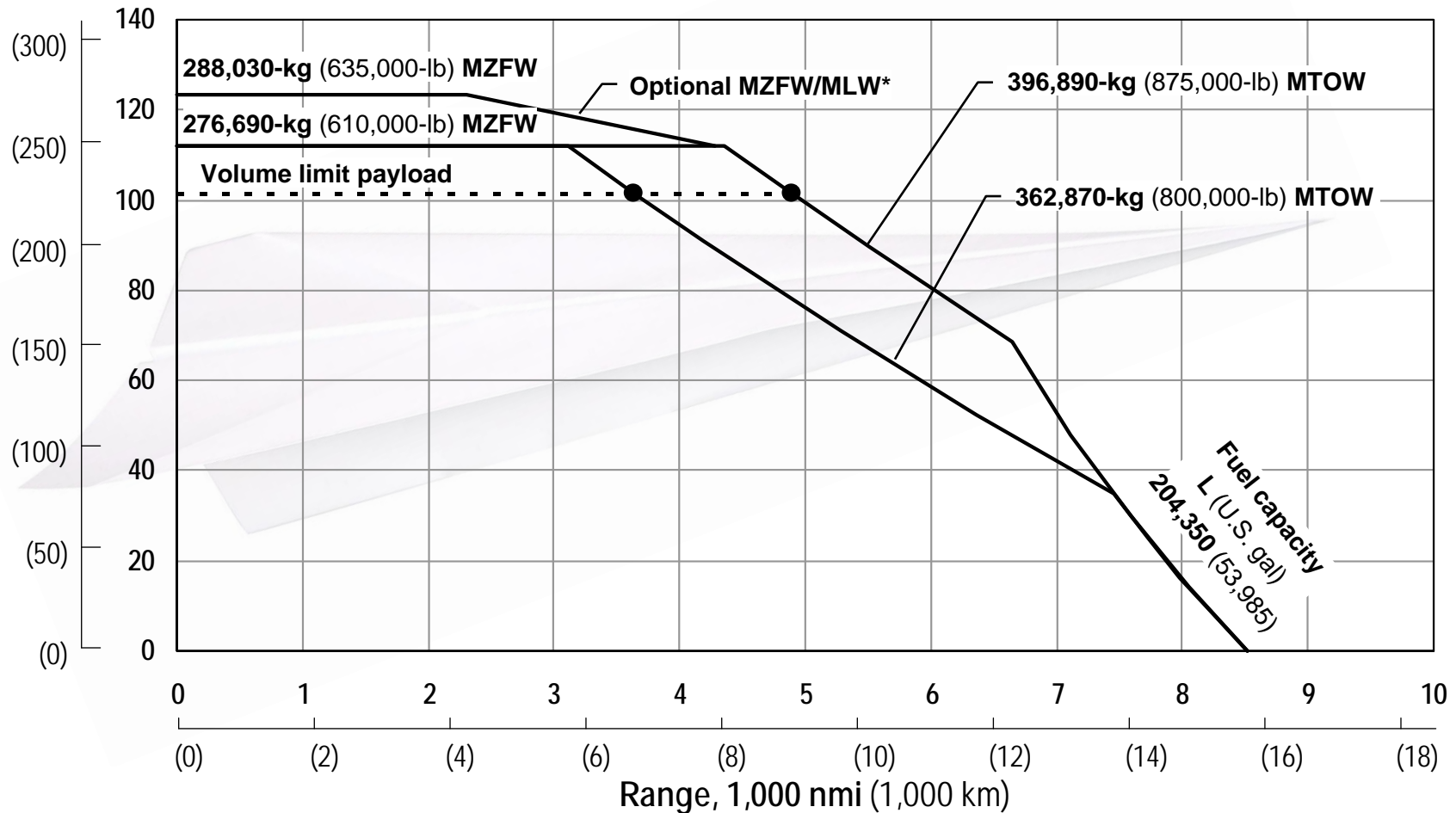
747-400 Freighter

Payload-range capability

StartupBoeing

Payload, 1,000 kg (1,000 lb)

Rolls-Royce engines



• Typical mission rules.

*MZFW decreases linearly from 288,030 kg (635,000 lb) to 276,690 kg (610,000 lb) as MTOW increases from 367,863 kg (811,000 lb) to 394,625 kg (870,000 lb).

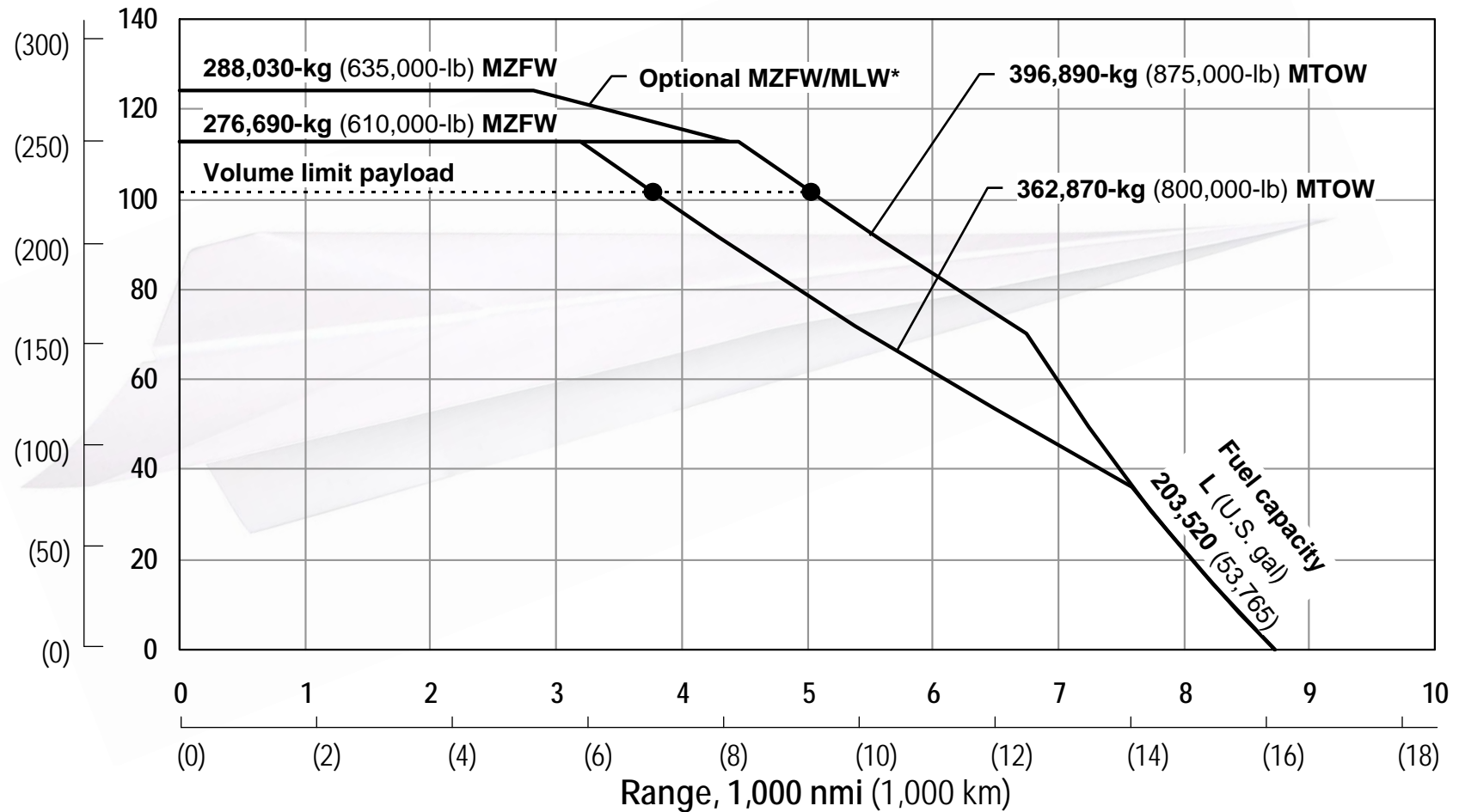
747-400 Freighter

Payload-range capability

StartupBoeing

Payload, 1,000 kg (1,000 lb)

General Electric engines



- Typical mission rules.

*MZFW decreases linearly from 288,030 kg (635,000 lb) to 276,690 kg (610,000 lb) as MTOW increases from 367,863 kg (811,000 lb) to 394,625 kg (870,000 lb).

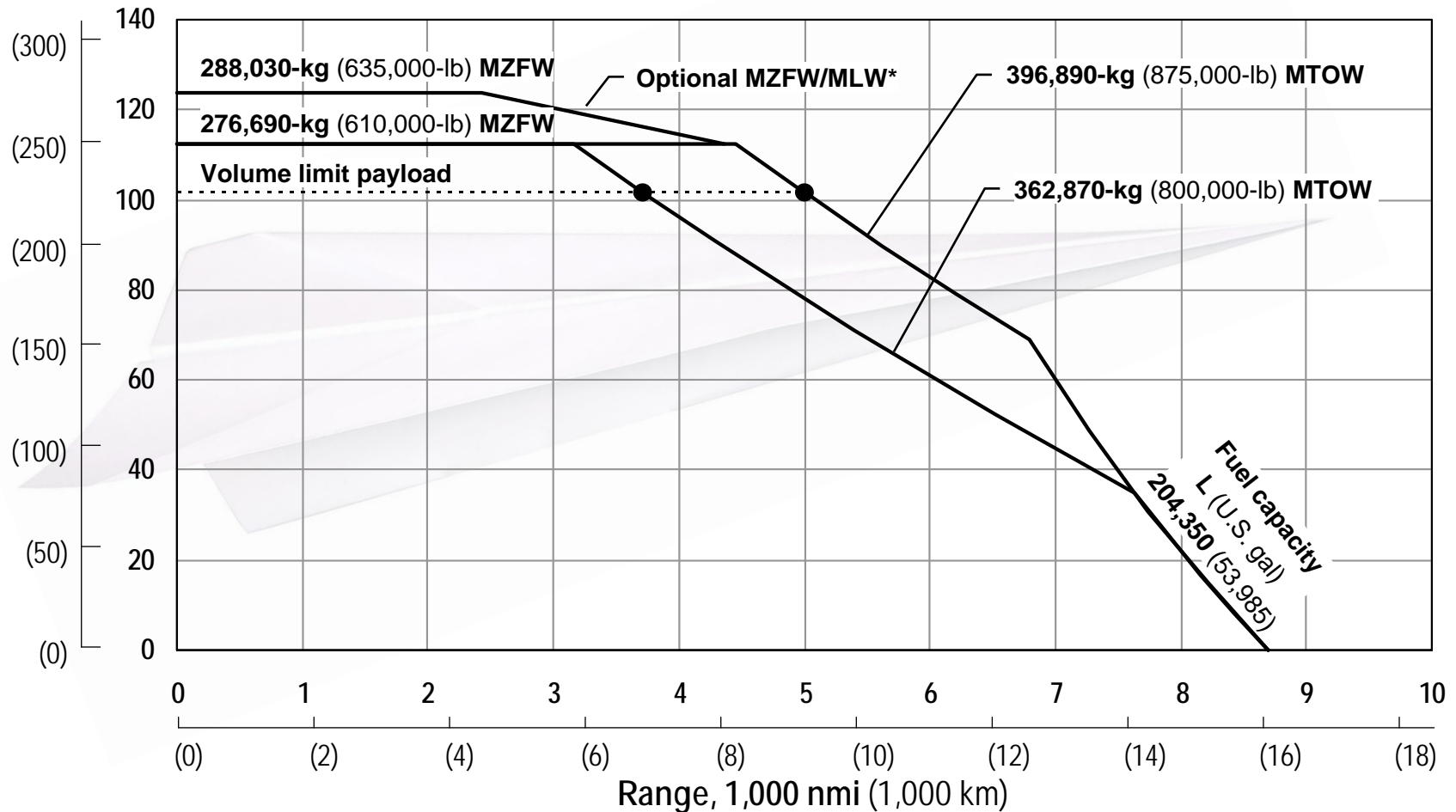
747-400 Freighter

Payload-range capability

StartupBoeing

Payload, 1,000 kg (1,000 lb)

Pratt & Whitney engines



• Typical mission rules.

*MZFW decreases linearly from 288,030 kg (635,000 lb) to 276,690 kg (610,000 lb) as MTOW increases from 367,863 kg (811,000 lb) to 394,625 kg (870,000 lb).

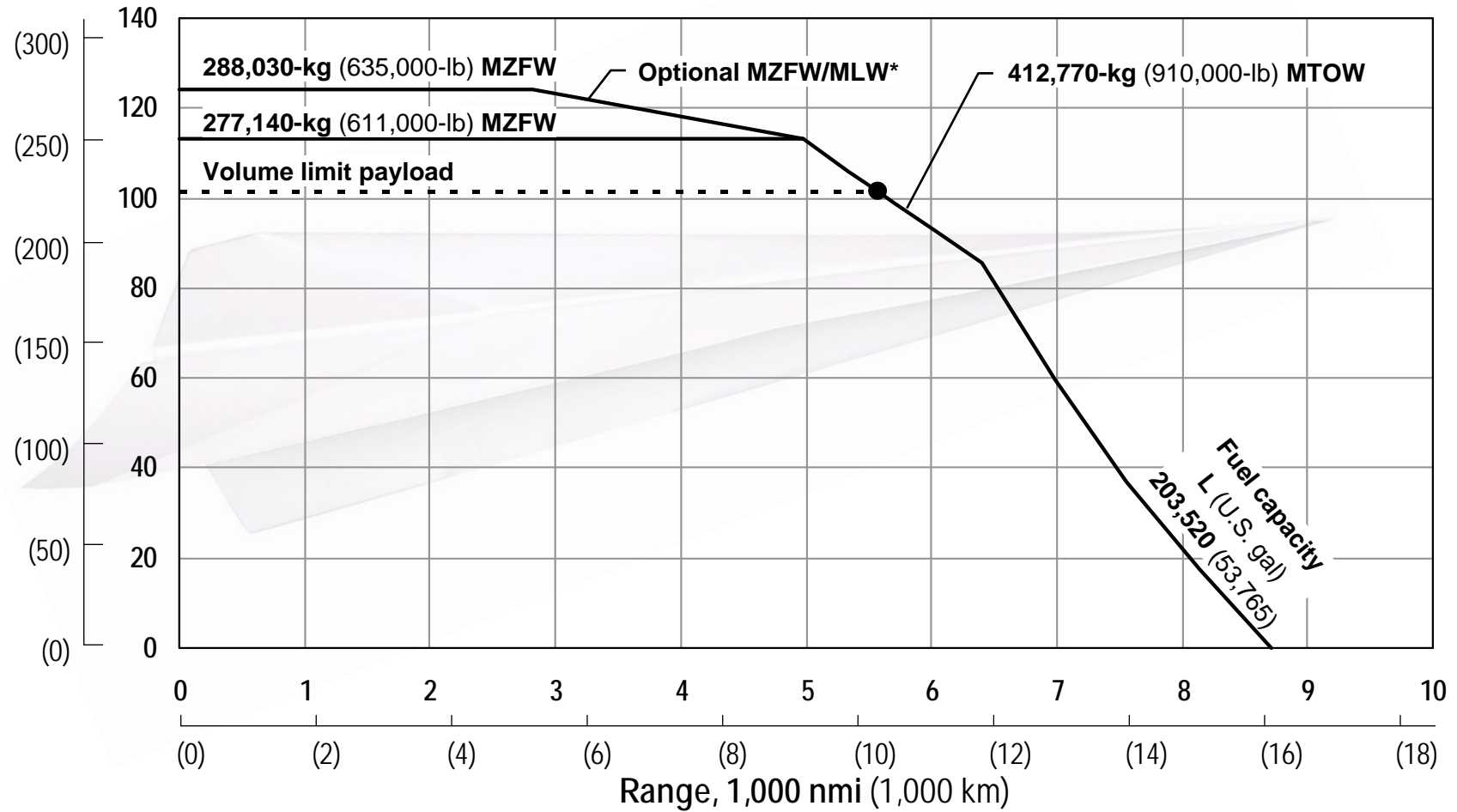
747-400ER Freighter

Payload-range capability

StartupBoeing

General Electric engines

Payload, 1,000 kg (1,000 lb)



• Typical mission rules.

*MZFW decreases linearly from 288,030 kg (635,000 lb) to 277,140 kg (611,000 lb) as MTOW increases from 367,863 kg (811,000 lb) to 412,760 kg (910,000 lb).

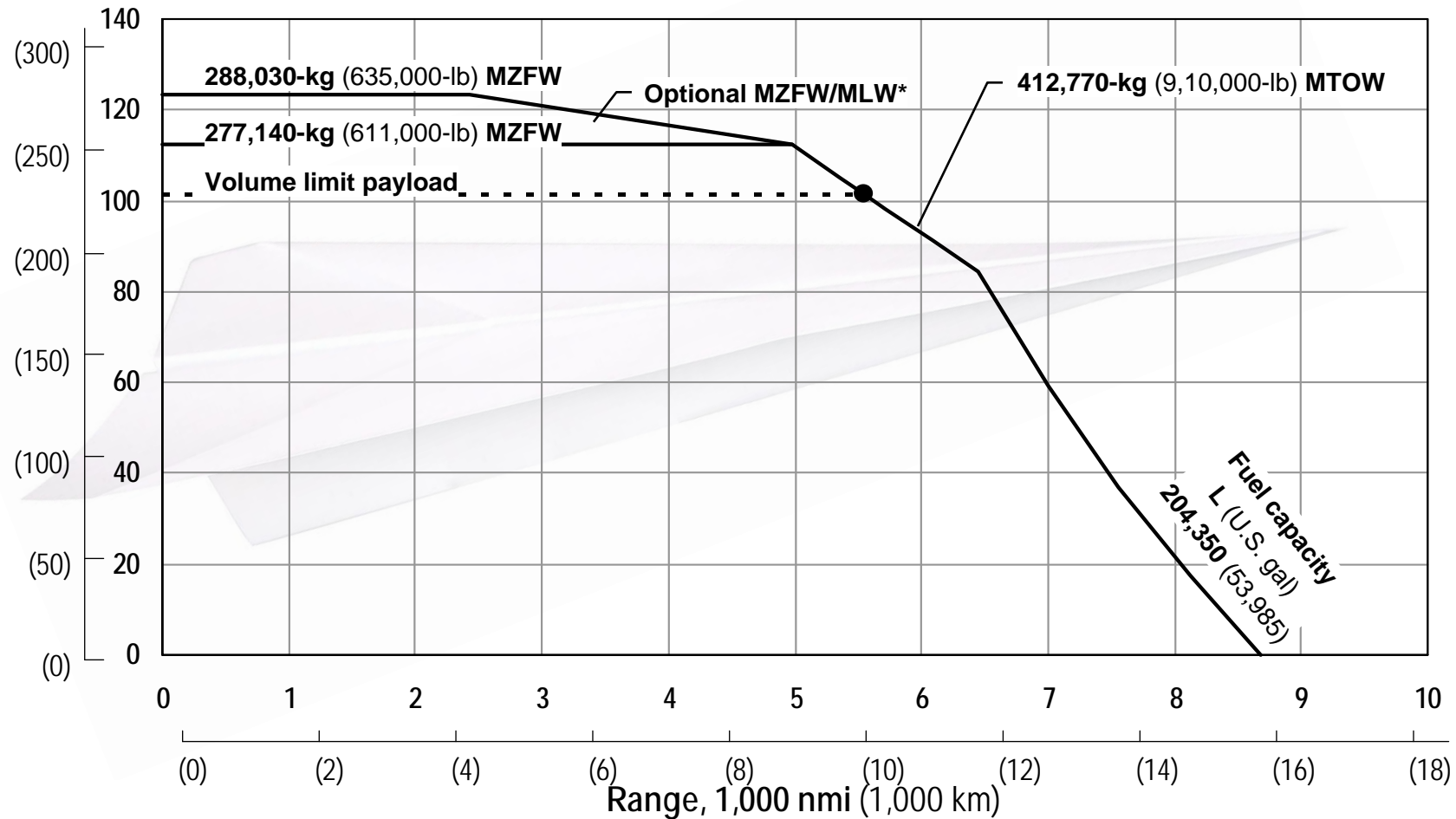
747-400ER Freighter

Payload-range capability

StartupBoeing

Pratt & Whitney engines

Payload, 1,000 kg (1,000 lb)



• Typical mission rules.

*MZFW decreases linearly from 288,030 kg (635,000 lb) to 277,140 kg (611,000 lb) as MTOW increases from 367,863 kg (811,000 lb) to 412,760 kg (910,000 lb).

747-400 Freighter

Performance summary

StartupBoeing

General Electric engines

		Basic	Option ²	Option ³
Cargo	MD pallets/LD pallets/LD containers ¹	30/9/2		
Engines		CF6-80C2-B1F	CF6-80C2-B5F	CF6-80C2-B1F
SL standard-day takeoff thrust/flat-rated temperature	lb/°F	56,500/90	62,100/86	56,500/90
Maximum taxi weight	kg (lb)	364,230 (803,000)	398,250 (878,000)	369,220 (814,000)
Maximum takeoff weight	kg (lb)	362,870 (800,000)	396,890 (875,000)	367,860 (811,000)
Maximum landing weight	kg (lb)	295,740 (652,000)	295,740 (652,000)	302,090 (666,000)
Maximum zero fuel weight	kg (lb)	276,690 (610,000)	276,690 (610,000)	288,030 (635,000)
Operating empty weight ⁴	kg (lb)	163,700 (360,900)	163,700 (360,900)	163,700 (360,900)
Tare weight	kg (lb)	5,450 (12,010)	5,450 (12,010)	5,450 (12,010)
Fuel capacity	L (U.S. gal)	203,520 (53,765)	203,520 (53,765)	203,520 (53,765)
Maximum revenue payload	kg (lb)	112,990 (249,100)	112,990 (249,100)	124,330 (274,100)
Design range (at max. revenue payload)	nmi (km)	3,190 (5,910)	4,455 (8,250)	2,825 (5,230)
Cruise Mach		0.845	0.845	0.845
Takeoff field length (SL, 86°F, MTOW)	m (ft)	2,820 (9,250)	3,110 (10,200)	2,910 (9,550)
Initial cruise altitude (MTOW, ISA + 10°C)	ft	34,600	32,700	34,300
Landing field length (MLW)	m (ft)	2,195 (7,200)	2,195 (7,200)	2,225 (7,300)
Approach speed (MLW)	kias	157	157	158
Block fuel data				
3,000 nmi	kg (lb)	68,200 (150,360)	68,200 (150,360)	Not applicable ⁵

- Typical mission rules.

¹196- x 125-in pallets/LD-1 containers.

²Highest available MTOW, only available with 276,690-kg (610,000-lb) MZFW.

³Highest available MZFW, only available with 367,860-kg (811,000-lb) MTOW. Operating restrictions require linear reduction in MTOW with MZFW increase from 276,690 to 288,030-kg (610,000 to 635,000 lb).

⁴Includes tare weight.

⁵Maximum landing weight limited.

747-400 Freighter

Performance summary

StartupBoeing

Pratt & Whitney engines

		Basic	Option ²	Option ³
Cargo	MD pallets/LD pallets/LD containers ¹	30/9/2		
Engines		PW4056	PW4062	PW4056
SL standard-day takeoff thrust/flat-rated temperature	lb/°F	57,100/92	63,300/86	57,100/92
Maximum taxi weight	kg (lb)	364,230 (803,000)	398,250 (878,000)	369,220 (814,000)
Maximum takeoff weight	kg (lb)	362,870 (800,000)	396,890 (875,000)	367,870 (811,000)
Maximum landing weight	kg (lb)	295,740 (652,000)	295,740 (652,000)	302,100 (666,000)
Maximum zero fuel weight	kg (lb)	276,690 (610,000)	276,690 (610,000)	288,030 (635,000)
Operating empty weight ⁴	kg (lb)	164,380 (362,400)	164,380 (362,400)	164,380 (362,400)
Tare weight	kg (lb)	5,450 (12,010)	5,450 (12,010)	5,450 (12,010)
Fuel capacity	L (U.S. gal)	204,350 (53,985)	204,350 (53,985)	204,350 (53,985)
Maximum revenue payload	kg (lb)	112,310 (247,600)	112,310 (247,600)	123,650 (272,600)
Design range (at max. revenue payload)	nmi (km)	3,170 (5,870)	4,450 (8,240)	2,430 (4,500) ⁵
Cruise Mach		0.845	0.845	0.845
Takeoff field length (SL, 86°F, MTOW)	m (ft)	2,820 (9,250)	2,985 (9,800)	2,910 (9,550)
Initial cruise altitude (MTOW, ISA + 10°C)	ft	34,600	32,700	34,300
Landing field length (MLW)	m (ft)	2,165 (7,100)	2,165 (7,100)	2,225 (7,300)
Approach speed (MLW)	kias	157	157	158
Block fuel data				
3,000 nmi	kg (lb)	68,280 (150,530)	68,280 (150,530)	Not applicable ⁵

- Typical mission rules.

¹196- x 125-in pallets/LD-1 containers.

²Highest available MTOW, only available with 276,690-kg (610,000-lb) MZFW.

³Highest available MZFW, only available with 367,860-kg (811,000-lb) MTOW. Operating restrictions require linear reduction in MTOW with MZFW increase from 276,690 to 288,030-kg (610,000 to 635,000 lb).

⁴Includes tare weight.

⁵Maximum landing weight limited.

747-400 Freighter

Performance summary

StartupBoeing

Rolls-Royce engines

		Basic	Option ²	Option ³
Cargo	MD pallets/LD pallets/LD containers ¹	30/9/2		
Engines		RB211-524G-T	RB211-524H-T	RB211-524G-T
SL standard-day takeoff thrust/flat-rated temperature	lb/°F	56,400/86	59,500/86	56,400/86
Maximum taxi weight	kg (lb)	304,230 (803,000)	398,250 (878,000)	369,220 (814,000)
Maximum takeoff weight	kg (lb)	302,870 (800,000)	396,890 (875,000)	367,860 (811,000)
Maximum landing weight	kg (lb)	295,740 (652,000)	295,740 (652,000)	302,090 (666,000)
Maximum zero fuel weight	kg (lb)	276,690 (610,000)	276,690 (610,000)	288,030 (635,000)
Operating empty weight ⁴	kg (lb)	164,520 (362,700)	164,520 (362,700)	164,520 (362,700)
Tare weight	kg (lb)	5,450 (12,010)	5,450 (12,010)	5,450 (12,010)
Fuel capacity	L (U.S. gal)	204,350 (53,985)	204,350 (53,985)	204,350 (53,985)
Maximum revenue payload	kg (lb)	112,170 (247,300)	112,170 (247,300)	123,510 (272,300)
Design range (at max. revenue payload)	nmi (km)	3,110 (5,760)	4,365 (8,080)	2,305 (4,270) ⁵
Cruise Mach		0.845	0.845	0.845
Takeoff field length (SL, 86°F, MTOW)	m (ft)	2,850 (9,350)	3,290 (10,800)	2,920 (9,600)
Initial cruise altitude (MTOW, ISA + 10°C)	ft	34,600	32,700	34,300
Landing field length (MLW)	m (ft)	2,165 (7,100)	2,165 (7,100)	2,225 (7,300)
Approach speed (MLW)	kias	157	157	158
Block fuel data				
3,000 nmi	kg (lb)	69,540 (153,320)	69,540 (153,320)	Not applicable ⁵

- Typical mission rules.

¹196- x 125-in pallets/LD-1 containers.

²Highest available MTOW, only available with 276,690-kg (610,000-lb) MZFW.

³Highest available MZFW, only available with 367,860-kg (811,000-lb) MTOW. Operating restrictions require linear reduction in MTOW with MZFW increase from 276,690 to 288,030-kg (610,000 to 635,000 lb).

⁴Includes tare weight.

⁵Maximum landing weight limited.

747-400ER Freighter

Performance summary

StartupBoeing

General Electric engines

		Basic	Option ²
Cargo	MD pallets/LD pallets/LD containers ¹	30/9/2	
Engines		CF6-80C2-B5F	CF6-80C2-B5F
SL standard-day takeoff thrust/flat-rated temperature	lb/°F	62,100/86	62,100/86
Maximum taxi weight	kg (lb)	414,130 (913,000)	369,220 (814,000)
Maximum takeoff weight	kg (lb)	412,770 (910,000)	367,860 (811,000)
Maximum landing weight	kg (lb)	296,200 (653,000)	302,090 (666,000)
Maximum zero fuel weight	kg (lb)	277,140 (611,000)	288,030 (635,000)
Operating empty weight ³	kg (lb)	164,020 (361,600)	164,020 (361,600)
Tare weight	kg (lb)	5,450 (12,010)	5,450 (12,010)
Fuel capacity	L (U.S. gal)	203,520 (53,765)	203,520 (53,765)
Maximum revenue payload	kg (lb)	113,130 (249,400)	124,010 (273,400)
Design range (at max. revenue payload)	nmi (km)	4,980 (9,220)	2,825 ⁴ (5,230) ⁴
Cruise Mach		0.845	0.845
Takeoff field length (SL, 86°F, MTOW)	m (ft)	3,340 (10,950)	2,560 (8,400)
Initial cruise altitude (MTOW, ISA + 10°C)	ft	31,800	34,300
Landing field length (MLW)	m (ft)	2,180 (7,150)	2,255 (7,400)
Approach speed (MLW)	kias	157	158
Block fuel data			
3,000 nmi	kg (lb)	68,310 (150,590)	Not applicable ⁴

- Typical mission rules.

¹196- x 125-in pallets/LD-1 containers.

²Highest available MZFW, only available with 367,860-kg (811,000-lb) MTOW. Operating restrictions require linear reduction in MTOW with MZFW increase from 276,690 to 288,030-kg (610,000 to 635,000 lb).

³Includes tare weight.

⁴Maximum landing weight limited.

747-400ER Freighter

Performance summary

StartupBoeing

Pratt & Whitney engines

		Basic	Option ²
Cargo	MD pallets/LD pallets/LD containers ¹	30/9/2	
Engines		PW4062	PW4062
SL standard-day takeoff thrust/flat-rated temperature	lb/°F	63,300/86	63,300/86
Maximum taxi weight	kg (lb)	414,130 (913,000)	369,220 (814,000)
Maximum takeoff weight	kg (lb)	412,770 (910,000)	367,860 (811,000)
Maximum landing weight	kg (lb)	296,200 (653,000)	302,090 (666,000)
Maximum zero fuel weight	kg (lb)	277,140 (611,000)	288,030 (635,000)
Operating empty weight ³	kg (lb)	164,700 (363,100)	164,700 (363,100)
Tare weight	kg (lb)	5,450 (12,010)	5,450 (12,010)
Fuel capacity	L (U.S. gal)	204,350 (53,985)	204,350 (53,985)
Maximum revenue payload	kg (lb)	112,450 (247,900)	123,330 (271,900)
Design range (at max. revenue payload)	nmi (km)	4,985 (9,230)	2,430 ⁴ (4,500) ⁴
Cruise Mach		0.845	0.845
Takeoff field length (SL, 86°F, MTOW)	m (ft)	3,290 (10,800)	2,540 (8,350)
Initial cruise altitude (MTOW, ISA + 10°C)	ft	31,900	34,300
Landing field length (MLW)	m (ft)	2,195 (7,200)	2,255 (7,400)
Approach speed (MLW)	kias	157	158
Block fuel data			
3,000 nmi	kg (lb)	68,380 (150,750)	Not applicable ⁴

- Typical mission rules.

¹196- x 125-in pallets/LD-1 containers.

²Highest available MZFW, only available with 367,860-kg (811,000-lb) MTOW. Operating restrictions require linear reduction in MTOW with MZFW increase from 276,690 to 288,030-kg (610,000 to 635,000 lb).

³Includes tare weight.

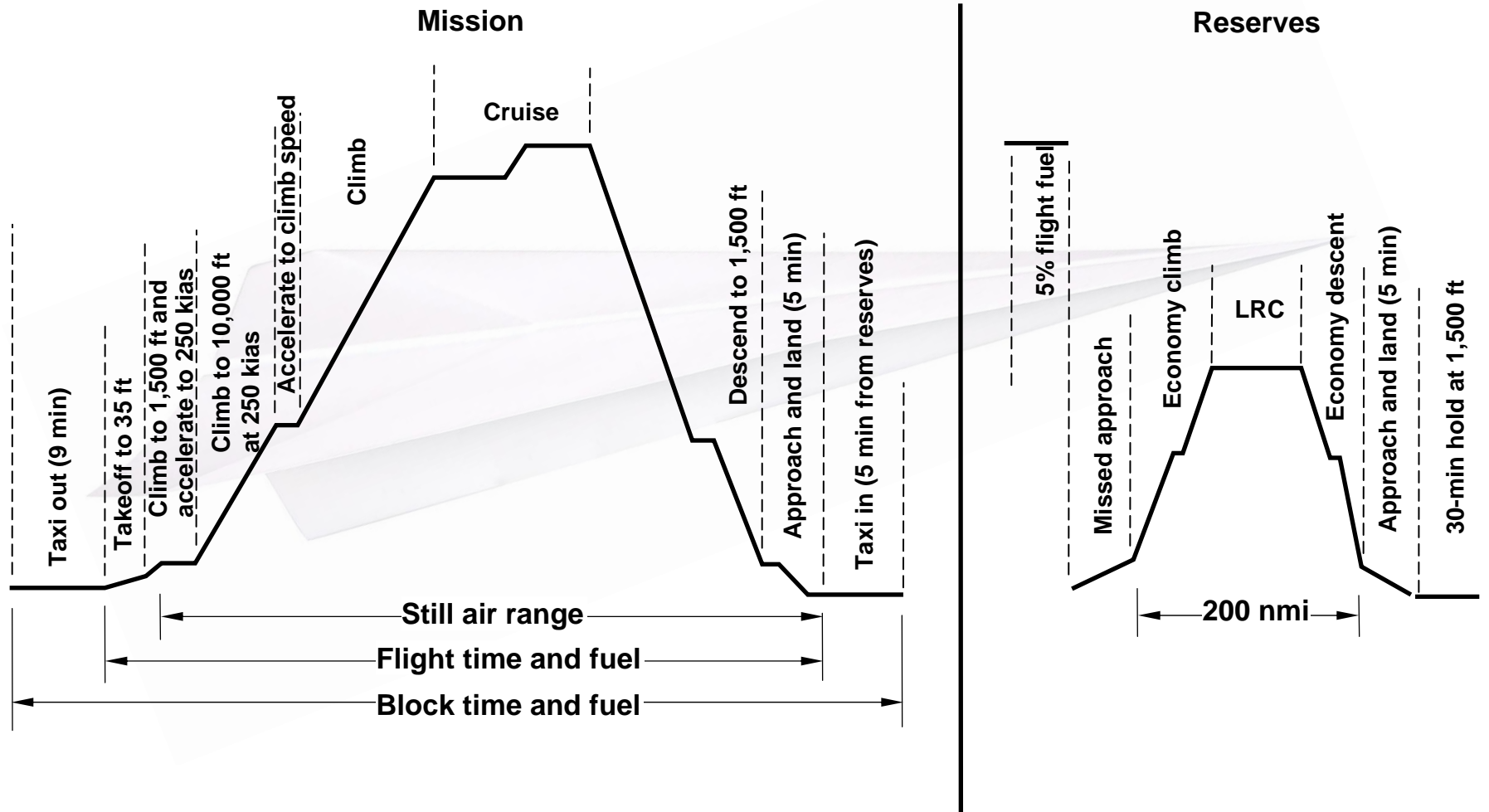
⁴Maximum landing weight limited.

747-400/-400ER Freighter

Mission profile

StartupBoeing

Typical mission rules



- Standard day.
- 6.7 lb per U.S. gal fuel density.
- Nominal performance.

747-400/-400ER Freighter

Range capability from New York

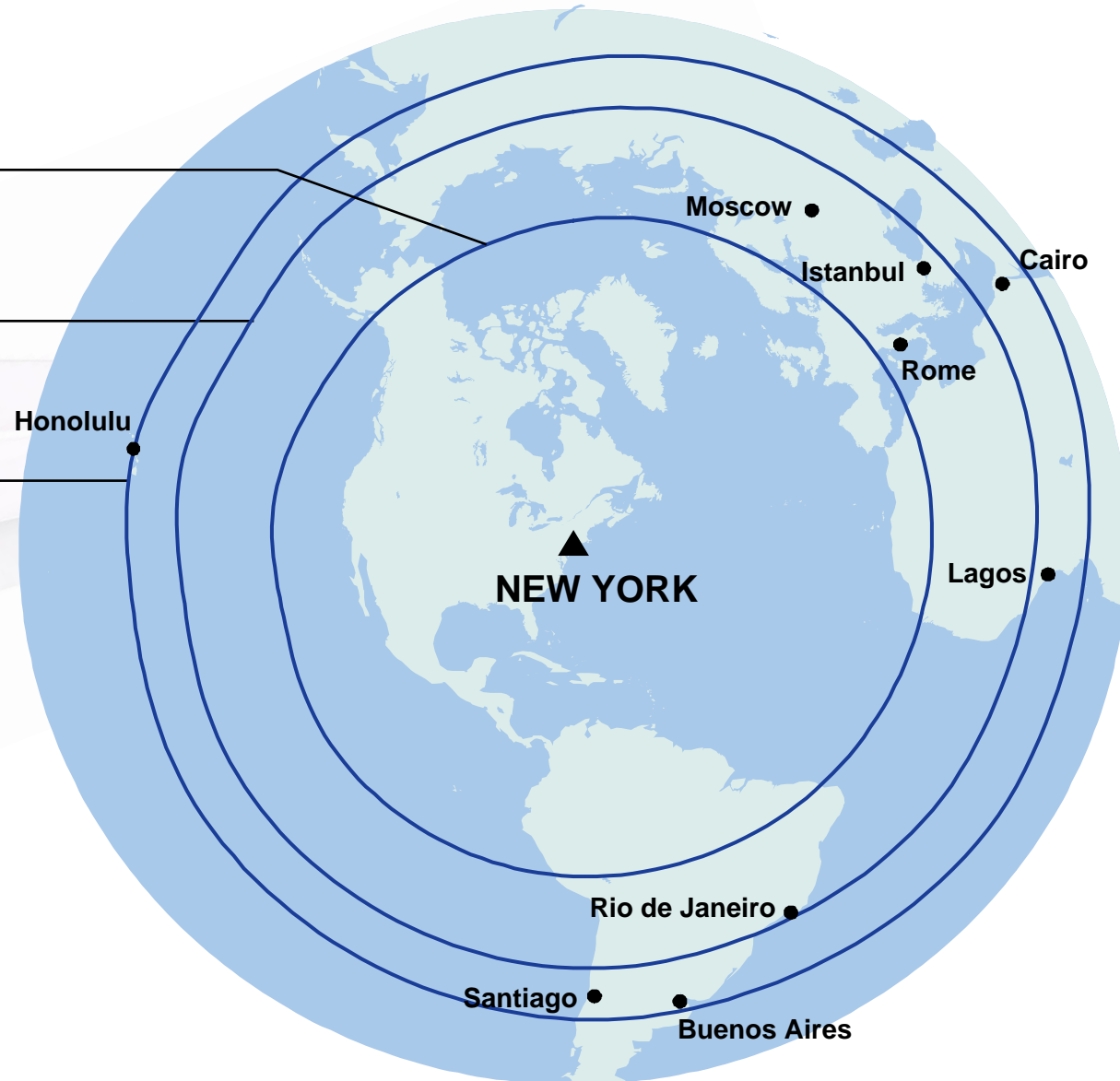
StartupBoeing

*Maximum revenue payload**

747-200F
377,842-kg (833,000-lb) MTOW
111-tonne (122-tons) payload

747-400F
396,893-kg (875,000-lb) MTOW
113-tonne (124-tons) payload

747-400ERF
412,770-kg (910,000-lb) MTOW
113-tonne (124-tons) payload



- Typical mission rules.
- 85% annual winds.
- Airways and traffic allowances included.
- Range capability from New York.

* Does not include tare.

747-400/-400ER Freighter

Range capability from Dubai

StartupBoeing

*Maximum revenue payload**

747-200F
377,842-kg (833,000-lb) MTOW
111-tonne (122-tons) payload

747-400F
396,893-kg (875,000-lb) MTOW
113-tonne (124-tons) payload

747-400ERF
412,770-kg (910,000-lb) MTOW
113-tonne (124-tons) payload

- Typical mission rules.
- 85% annual winds.
- Airways and traffic allowances included.
- Range capability from Dubai.

* Does not include tare.



747-400/-400ER Freighter

Range capability from Hong Kong

StartupBoeing

*Maximum revenue payload**

747-200F
377,842-kg (833,000-lb) MTOW
111-tonne (122-tons) payload

747-400F
396,893-kg (875,000-lb) MTOW
113-tonne (124-tons) payload

747-400ERF
412,770-kg (910,000-lb) MTOW
113-tonne (124-tons) payload



- Typical mission rules.
- 85% annual winds.
- Airways and traffic allowances included.
- Range capability from Hong Kong.

* Does not include tare.

747-400/-400ER Freighter

Range capability from London

StartupBoeing

*Maximum revenue payload**

747-200F

377,842-kg (833,000-lb) MTOW
111-tonne (122-tons) payload

747-400F

396,893-kg (875,000-lb) MTOW
113-tonne (124-tons) payload

747-400ERF

412,770-kg (910,000-lb) MTOW
113-tonne (124-tons) payload



- Typical mission rules.
- 85% annual winds.
- Airways and traffic allowances included.
- Range capability from London.

* Does not include tare.