747-100/-200 Freighter

StartupBoeing
747-200 Freighter General Arrangement
747-200 Freighter Basic Arrangement

**Flight deck**

Crew + 3 supernumeraries

**Main deck**

Twenty-nine 96- x 125-in pallet positions

**Lower hold**

30 LD-1 containers

800 ft³ bulk

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747-200 Freighter Main Deck Arrangements

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
Cadillac Allanté Airbridge

56 cars total

45 cars on main deck
11 cars in lower hold
747-200 Freighter Car Transport
747-200 Freighter Floor Strength Comparison

Production 747-200F Versus 747-100/-200SF

Maximum load, lb per 96- x 125-in pallet position

<table>
<thead>
<tr>
<th></th>
<th>747-200F (ref)</th>
<th>Special Freighter</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 positions</td>
<td>10,600</td>
<td>6,000</td>
</tr>
<tr>
<td></td>
<td>15,000</td>
<td>9,400</td>
</tr>
<tr>
<td></td>
<td>10,600</td>
<td>9,400</td>
</tr>
<tr>
<td></td>
<td>4,500</td>
<td>4,500</td>
</tr>
</tbody>
</table>

Side door area
747 Freighter Cargo Weight Capability

747-200 Freighter

- Weight in thousands of pounds
- 96 x 125-inch pallets
- All weights shown include tare weight of pallets/containers

* Limited by cargo restraints to 10,000 lb
747-200 Freighter Arrangement

All-Pallet Models

Flight deck

Crew + 3 supernumeraries

Main deck

Twenty-nine 96- x 125-in pallet positions

Lower hold

Nine 96- x 125-in pallets

800 ft³ bulk
### 747 Freighter Lower Hold Arrangements

#### LD-1 and LD-3

<table>
<thead>
<tr>
<th>Units</th>
<th>Volume, ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower hold</td>
<td>6,050</td>
</tr>
<tr>
<td>Bulk cargo</td>
<td>5,250 800</td>
</tr>
<tr>
<td>Total capacity</td>
<td>5,540</td>
</tr>
</tbody>
</table>

#### LD-1

<table>
<thead>
<tr>
<th>Units</th>
<th>Volume, ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower hold</td>
<td>3,735 800</td>
</tr>
<tr>
<td>Bulk cargo</td>
<td>3,429 350 800</td>
</tr>
<tr>
<td>Total capacity</td>
<td>4,579</td>
</tr>
</tbody>
</table>

* Optional pallet hardware required

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747 Freighter Lower Hold Capability

Containers and Pallets

Basic

3,500 lb MGW
175 ft²
(LD-1)

92 in
60.4 in
64 in
61.5 in

79 in
60.4 in
64 in
61.5 in

160 in
50.4 in
64 in
125 in

10,200 lb MGW*
320 ft² (military)
327 ft³ (commercial)

10,200 lb MGW*
381 ft³
(LD-9)

Optional

(Additional hardware required)

3,500 lb MGW
159 ft²
(LD-3)

88 in
108 in

11,100 lb MGW*
407 ft³

10,200 lb MGW*
372 ft³

7,000 lb MGW*
322 ft³
(LD-6)

96 in
125 in

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

- 150 in (381 cm)
- 125 in (318 cm)
- 105 in (267 cm)
- 98 in (249 cm)
- 77 in (196 cm)
- 140 in (356 cm)
- 98 in (249 cm)
- 12 in (30 cm)

Normal excursion:
- 193-in (490 cm) light wt, aft CG
- 178-in (452 cm) heavy wt, fwd CG

Sta 228

Ground line
# 747 Freighter Performance Summary

<table>
<thead>
<tr>
<th>Engines</th>
<th>747-100SF</th>
<th>747-200SF</th>
<th>747-200F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLST to FR temperature</td>
<td>JT9D-7A</td>
<td>JT9D-7Q</td>
<td>JT9D-7R4G2</td>
</tr>
<tr>
<td>lb to °F</td>
<td>46,950 to 80</td>
<td>53,000 to 86</td>
<td>54,750 to 86</td>
</tr>
<tr>
<td>Max takeoff weight</td>
<td>lb</td>
<td>734,000</td>
<td>820,000</td>
</tr>
<tr>
<td>Max landing weight</td>
<td>lb</td>
<td>585,000</td>
<td>630,000</td>
</tr>
<tr>
<td>Max zero fuel weight</td>
<td>lb</td>
<td>545,000</td>
<td>590,000</td>
</tr>
<tr>
<td>Tare weight</td>
<td>lb</td>
<td>11,300</td>
<td>11,300</td>
</tr>
<tr>
<td>Operating empty weight</td>
<td>lb</td>
<td>334,800</td>
<td>351,100</td>
</tr>
<tr>
<td>Structural payload</td>
<td>lb</td>
<td>210,200</td>
<td>238,900</td>
</tr>
<tr>
<td>Design range</td>
<td>nmi</td>
<td>2,656</td>
<td>3,050</td>
</tr>
<tr>
<td>Takeoff field length at 86°F</td>
<td>ft</td>
<td>10,100</td>
<td>10,550</td>
</tr>
<tr>
<td>Initial cruise altitude — MTOW</td>
<td>ft</td>
<td>32,300</td>
<td>33,400</td>
</tr>
<tr>
<td>Landing field length — MLW</td>
<td>ft</td>
<td>6,350</td>
<td>6,910</td>
</tr>
<tr>
<td>Approach speed — MLW</td>
<td>kt</td>
<td>144</td>
<td>152</td>
</tr>
<tr>
<td>Block fuel</td>
<td>2,000-nmi mission</td>
<td>115,638</td>
<td>124,107</td>
</tr>
</tbody>
</table>

- Typical mission rules
- Nominal performance level
747-200 Freighter Payload-Range Capability

**Typical Mission Rules**

- JT9D-7R4G2 engines
- Standard day
- OEW 342,500 lb with nose door
- OEW 350,460 lb including side cargo door
- Tare weight of 29 pallets and 30 LD-1 containers (14,410 lb) included in OEW

![Graph showing payload-range capability for MZFW 590,000 lb and MBRW 833,000 lb, including side cargo door, fuel capacity 53,985 U.S. gal.]
747-200SF Payload-Range Capability

Pratt & Whitney PW JT9D-7Q Engines

- JT9D-7Q engines
- Typical mission rules
- Standard day
- 6.75-lb per U.S. gal fuel density
- 3% SFC and 1% drag in-service deterioration assumed
- OEW 351,000 includes 11,310-lb tare

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747-100SF Payload-Range Capability

747-100 Special Freighter

- JT9D-7A engines (-100 "CN" nacelle)
- Typical mission rules; 200 nmi alternate
- Standard day
- Long-range cruise
- OEW 345,600 lb (includes 3,890 lb of typical standard and operating items, plus 11,310 lb pallet tare)
- Fuel capacity 47,210 U.S. gallons
- 4% fuel burn in-service degradation

A linear reduction in maximum takeoff weight from 750,000 to 734,000 lb is required as zero fuel weight increases from 545,000 to 560,000 lb
747 Freighter Mission Profile

**Typical Mission Rules**

- **Mission**
  - Still air range
  - Flight time & fuel
  - Block time & fuel
  - Takeoff to 35 ft
  - Climb to 1,500 ft and accelerate to 250 kn
  - Climb to 10,000 ft at 250 kn
  - Accelerate to climb speed
  - Cruise
  - Descend to 1,500 ft
  - Approach and land (6 min)
  - Taxi in (5 min from reserves)

- **Reserves**
  - 5% flight fuel
  - Missed approach
  - Economy climb
  - LRC
  - Economy descent
  - Approach and land (5 min)
  - 30-min hold at 1,500 ft

- **Still air range**
- **Flight time & fuel**
- **Block time & fuel**

- **Standard day**
- Fuel density 6.7 lb/U.S. gal
- Nominal performance

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747 Freighter Range Capability

- 85% annual winds
- Unrestricted direct routing
- Maximum revenue payloads (excludes tare)
747 Freighter Range Capability

- 85% annual winds
- Unrestricted direct routing
- Maximum revenue payloads (excludes tare)