

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

A20WE
BOEING
Revision 32

747-100 Series
747-200B Series
747-200F Series
747-200C Series
747SR Series
747SP Series
747-100B Series
747-300 Series
747-100B SUD Series
747-400 Series
747-400D Series
747-400F Series

March 8, 2002

TYPE CERTIFICATE DATA SHEET NO. A20WE

This data sheet, which is a part of Type Certificate No. A20WE, prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Holder of Type Certificate: THE BOEING COMPANY
 PO Box 3707
 Seattle, WA 98124

I - 747-100 (Approved December 30, 1969) Transport Aircraft

- Engines: 4 Pratt and Whitney JT9D-3, JT9D-3A, or JT9D-7, JT9D-7A, JT9D-7F, JT9D-7J.
See NOTE 5 regarding intermixing of engines.
- Fuel: See NOTE 3.
- Engine Limits: See data pertinent to all models.
- Airspeed Limits: VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.
- C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.
- Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.
- Maximum Baggage/Cargo: See the appropriate Weight and Balance Control and Loading Manual.
- Fuel and Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.
 FAA Approved Weight and Balance Control and Loading Manual: D6-13700
 FAA Approved Airplane Flight Manual: D6-13703

| | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Page No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| Rev. No. | 32 | 28 | 20 | 20 | 20 | 20 | 20 | 21 | 20 | 20 | 20 | 32 | 32 | 32 | |
| Page No. | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| Rev. No. | 27 | 29 | 32 | 32 | 27 | 30 | 32 | 32 | 29 | 28 | 32 | 25 | 27 | 28 | 29 |

I. 747-100 (cont'd):

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|---|
| 747-1D1 | 20208 |
| 747-121 | 19637-19661, 20347-20354 |
| 747-122 | 19753-19757, 19875-19883, 19925-19928 |
| 747-123 | 20100-20109, 20323-20326, 20390, 20391 |
| 747-124 | 19733-19735, 20305 |
| 747-127 | 20207 |
| 747-128 | 19749-19752, 20355, 20376-20378, 20541-20543, 20798-20800, 20954, 21141 |
| 747-129 | 20401, 20402 |
| 747-130 | 19746-19748 |
| 747-131 | 19667-19678, 20080-20083, 20320-20322 |
| 747-132 | 19896-19898, 20246, 20247 |
| 747-133 | 20013-20015, 20767, 20881 |
| 747-135 | 19918, 19919 |
| 747-136 | 19761-19766, 20269-20273, 20284, 20708, 20809, 20810, 20952, 20953, 21213 |
| 747-143 | 19729, 19730 |
| 747-146 | 19725-19727, 20332, 20528, 20531, 20532, 21029 |
| 747-148 | 19744, 19745 |
| 747-151 | 19778-19787 |
| 747-156 | 19957, 19958 |

II - 747-200B (Approved December 23, 1970) Transport Aircraft

The 747-200B is an extended-range passenger version of the basic 747-100 series aircraft. The exterior geometry of the 747-200B is identical to the 747-100 and aircraft systems are essentially unchanged except for differences resulting from changes outlined below. The principal differences involve the following:

Increased strength wing structure, local body and empennage changes for increased strength, increased center wing tank fuel capacity, increased strength landing gear, modified nacelle and engine acoustic treatment, increased gross weight, and modified balance limits.

| | |
|---|--|
| Engines: | 4 Pratt and Whitney JT9D-3A, JT9D-7, JT9D-7A, JT9D-7F, JT9D-7J, JT9D-70A, JT9D-7Q, JT9D-7Q3, JT9D-7R4G2, or 4 General Electric CF6-50E, CF6-50E1, CF6-50E2, CF6-80C2B1 or 4 Rolls Royce RB211-524B, RB211-524B2, RB211-524C2, RB211- 524D4. <i>See NOTE 5 regarding intermixing of engines.</i> |
| Fuel: | See NOTE 3. |
| Engine Limits: | See data pertinent to all models. |
| Airspeed Limits: | VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA approved Airplane Flight Manual. |
| C.G. Range: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Weights: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Baggage/Cargo: | See the appropriate Weight and Balance Control and Loading Manual. |
| Fuel and Oil Capacity: | See the appropriate Weight and Balance Control and Loading Manual. |
| FAA Approved Weight and Balance Control and Loading Manual: | D6-13700, 1E-4A-5, 1E-4B-5 |
| FAA Approved Airplane Flight Manuals: | D6-13703, D6-33747, D6-34747, D6-35747 |

II. 747-200B (cont'd):

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--|
| 747-206B | 19922-19924, 20398-20400, 20427, 21110, 21111, 21549, 21550, 21659, 21660, 21848, 22376, 22379, 22380 |
| 747-209B | 21454, 21843, 22446, 22447 |
| 747-211B | 21516, 21517 |
| 747-212B | 20712, 20713, 20888, 21048, 21162, 21316, 21439, 21683, 21684, 21935-21944 |
| 747-217B | 20801, 20802, 20927, 20929 |
| 747-219B | 22722-22725, 22791 |
| 747-222B | 23736, 23737 |
| 747-227B | 21682, 21991, 22234 |
| 747-228B | 21326, 21429, 21537, 21731, 21745, 21982, 22272, 22427, 22428, 22794, 23611, 23676, 24067 |
| 747-230B | 20372, 20493, 20527, 20559, 21220, 21221, 21380, 21588-21591, 21643, 21644, 22363, 22669-22671, 23286, 23287, 23393, 23407, 23509, 23622 |
| 747-233B | 20977, 21627 |
| 747-236B | 21238-21241, 21350, 21351, 21536, 21635, 21830, 21831, 22303-22305, 22442, 23711, 23735, 23799, 24088 |
| 747-237B | 19959, 19960, 20459, 20558, 21182, 21446, 21473, 21829, 21993-21995 |
| 747-238B | 20009-20012, 20534, 20535, 20841, 20842, 20921, 21054, 21140, 21237, 21352-21354, 21657, 21658, 21977, 22145, 22614-22616 |
| 747-240B | 21825, 22077 |
| 747-243B | 19731, 19732, 20520, 22506-22508, 22510-22513, 22969, 23300, 23301, 23476 |
| 747-244B | 20237-20239, 20556, 20557, 22170, 22171 |
| 747-246B | 19823-19825, 20333, 20503-20505, 20529, 20530, 20924, 21030, 21031, 21678-21680, 22064, 22065, 22478, 22479, 22745, 22746, 22990, 22991, 23389 |
| 747-251B | 20356-20360, 21704-21709, 22389, 23111, 23112, 23547-23549 |
| 747-256B | 20137, 22238, 22239, 22454, 22455, 22764, 24071 |
| 747-257B | 20116, 20117 |
| 747-258B | 20135, 20274, 20704, 22254 |
| 747-259B | 21730 |
| 747-267B | 21746, 21966, 22149, 22429, 22530, 22872, 23048, 23120 |
| 747-269B | 21541-21543, 22740 |
| 747-281B | 23501, 23502, 23698, 23813, 24399 |
| 747-282B | 20501, 20502, 20928, 21035 |
| 747-283B | 20120, 20121, 21381, 21575, 22381, 22496 |
| 747-284B | 20742, 20825 |
| 747-286B | 21217, 21218 |
| 747-287B | 21189, 21725-21727, 22297, 22592, 22593 |
| 747-2B2B | 21614 |
| 747-2B3B | 22514, 22515 |
| 747-2B4B | 21097-21099 |
| 747-2B5B | 20770, 20771, 21772, 21773, 22482, 22485 |
| 747-2B6B | 21615 |
| 747-2D3B | 21251, 21252, 22579 |
| 747-2D7B | 21782-21784, 22337, 22471, 22472 |
| 747-2F6B | 21832-21834, 22382 |
| 747-2G4B | 23824, 23825 |
| 747-2H7B | 22378 |
| 747-2J6B | 23071, 23461, 23746 |
| 747-2L5B | 22105-22107 |
| 747-2Q2B | 21468 |
| 747-2U3B | 22246-22249, 22768, 22769 |
| 747-E4A | 20682-20684 |
| 747-E4B | 20949 |

III - 747-200F (Approved March 7, 1972) Transport Aircraft

The 747-200F is a freighter version of the basic 747-200B series aircraft. The exterior geometry of the 747-200F is identical to the 747-200B and aircraft systems are essentially unchanged except for differences resulting from the changes outlined below. The principal differences involve the following:

- Upward opening nose cargo door.
- Redesigned interior for freight handling.
- Revised upper deck layout for additional crew members.
- Increased strength of main deck floor and keel beam.
- Increased strength of center wing section.
- Deletion of main deck windows and passenger doors 1 through 5 right side and 2 through 4 left side.
 - T.E. flap two position load relief system.
 - Revised air conditioning system to suit freight requirements.
 - Main deck smoke detection system.
 - Optional main deck smoke detection system.
 - Optional side cargo door.

Engines: 4 Pratt and Whitney JT9D-3A, JT9D-7, JT9D-7A, JT9D-7F, JT9D-7J, JT9D-70A, JT9D-7Q, JT9D-7Q3, JT9D-7R4G2, or 4 General Electric CF6-50E, CF6-50E1, CF6-50E2 or 4 Rolls Royce RB211-524B, RB211-524B2, RB211-524C2, RB211-524D4.
See NOTE 5 regarding intermixing of engines.

Fuel: See NOTE 3.

Engine Limits: See data pertinent to all models.

Airspeed Limits: VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Baggage/Cargo: See the appropriate Weight and Balance Control and Loading Manual.

Fuel and Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.
FAA Approved Weight and Balance Control and Loading Manual: D6-13700

FAA Approved Airplane Flight Manuals: D6-13703, D6-33747, D6-35747, D6-34747

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--|
| 747-209F | 22299, 24308 |
| 747-212F | 24177 |
| 747-221F | 21743, 21744 |
| 747-228F | 20887, 21255, 21576, 21787, 22678, 22939, 24158, 24735, 24879, 25266 |
| 747-230F | 20373, 21592, 22668, 23348, 23621, 24138 |
| 747-236F | 22306 |
| 747-243F | 22545 |
| 747-245F | 20826, 20827, 21764, 21841, 22150, 22151 |
| 747-246F | 21034, 21681, 22063, 22477, 22989, 23391, 23641 |
| 747-249F | 21827, 21828, 22237, 22245 |
| 747-251F | 21120-21122, 21321, 22388, 23887, 23888 |
| 747-258F | 21737 |
| 747-267F | 23864, 24568 |
| 747-268F | 24359 |
| 747-281F | 23138, 23139, 23350, 23919, 24576, 25171 |
| 747-2B3F | 21515, 21835 |
| 747-2B5F | 22480, 22481, 22486, 24195, 24196 |
| 747-2J6F | 24960 |
| 747-2J9F | 21486, 21487, 21507, 21514, 21668 |
| 747-2R7F | 21650, 22390 |
| 747-2S4F | 22169 |

IV - 747-200C (Approved April 17, 1973) Transport Aircraft

The 747-200C is a convertible version of the basic 747-200B series aircraft. The exterior geometry of the 747-200C is identical to the 747-200B and aircraft systems are essentially unchanged except for differences resulting from the changes outlined below. The principal differences involve the following:

Upward opening nose cargo door.
 Redesigned interior permitting all passenger, all cargo, or mixed passenger/cargo configurations.
 Increased strength of main deck floor and keel beam.
 Increased strength of center wing section.
 T.E. flap two position load relief system.
 Main deck smoke detection system.
 Optional side cargo door.

Engines: 4 Pratt and Whitney JT9D-3A, JT9D-7, JT9D-7A, JT9D-7F, JT9D-7J, JT9D-70A, JT9D-7Q, JT9D-7Q3, JT9D-7R4G2, or 4 General Electric CF6-50E, CF6-50E1, CF6-50E2, or 4 Rolls Royce RB211-524B, RB211-524B2, RB211-524C2, RB211-524D4.
See NOTE 5 regarding intermixing of engines.

Fuel: *See NOTE 3.*

Engine Limits: See data pertinent to all models.

Airspeed Limits: VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Baggage/
 Cargo: See the appropriate Weight and Balance Control and Loading Manual.

Fuel and Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.

FAA Approved Weight and Balance Control and Loading Manual: D6-13700

FAA Approved Airplane Flight Manuals: D6-13703, D6-33747

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--------------------------------|
| 747-21AC | 23652, 24134 |
| 747-258C | 21190, 21594 |
| 747-270C | 21180, 21181, 22366 |
| 747-271C | 21964, 21965, 22403 |
| 747-273C | 20651-20653 |

V - 747SR (Approved September 26, 1973) Transport Aircraft

The 747SR is basically a 747-100 series airplane with certain modifications to improve the fatigue life.

Engines: 4 General Electric CF6-45A, CF6-45A2, CF6-50E2 or 4 Pratt and Whitney JT9D-7, JT9D-7A.
See NOTE 5 regarding intermixing of engines.

Fuel: *See NOTE 3.*

Engine Limits: See data pertinent to all models.

Airspeed Limits: VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.

V. 747SR (cont'd):

Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Baggage/Cargo: See the appropriate Weight and Balance Control and Loading Manual.

Fuel and Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.
FAA Approved Weight and Balance Control and Loading Manual: D6-13700

FAA Approved Airplane Flight Manuals: D6-13703, D6-33747

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--|
| 747SR-46 | 20781-20784, 20923, 21032, 21033 |
| 747SR-81 | 21604-21606, 21922-21925, 22291-22294, 22594, 22595, 22709-22712 |

VI - 747SP (Approved February 4, 1976) Transport Aircraft

The 747SP (Special Performance) is basically a long-range derivative of the 747-100. The exterior geometry of the 747SP has been changed from the 747-100. Aircraft systems are essentially unchanged except for differences resulting from changes outlined below. The principal differences involve the following:

- Overall airplane length is 47'1" shorter.
- Body is 48'5" shorter.
- Overall airplane height is approximately 2'11" higher.
- Vertical tail has been extended 5 feet.
- Horizontal tail has been extended on each end.
- Flaps have been modified to a single variable pivot flap.
- Main deck doors are reduced to 4 on each side.

Engines: 4 Pratt and Whitney JT9D-3, JT9D-3A, JT9D-7, JT9D-7A, JT9D-7F, JT9D-7J, or 4 Rolls Royce RB211-524B, RB211-524B2, RB211-524C2, RB211-524D4.
See NOTE 5 regarding intermixing of engines.

Fuel: See NOTE 3.

Engine Limits: See data pertinent to all models.

Airspeed Limits: VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Baggage/Cargo: See the appropriate Weight and Balance Control and Loading Manual.

Fuel and Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.
FAA Approved Weight and Balance Control and Loading Manual: D6-33800

FAA Approved Airplane Flight Manuals: D6-34047, D6-36747

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--|
| 747SP-09 | 21300, 22298, 22547, 22805 |
| 747SP-21 | 21022-21026, 21441, 21547, 21548, 21648, 21649 |
| 747SP-27 | 21785, 21786, 21992, 22302 |
| 747SP-31 | 21961-21963 |
| 747SP-38 | 22495, 22672 |
| 747SP-44 | 21132-21134, 21253, 21254, 21263 |
| 747SP-68 | 21652, 22503, 22750 |
| 747SP-70 | 22858 |
| 747SP-86 | 20998, 20999, 21093, 21758 |
| 747SP-94 | 21174, 21175 |
| 747SP-B5 | 22483, 22484 |
| 747SP-J6 | 21932-21934 |
| 747SP-Z5 | 23610 |

VII - 747-100B (Approved August 1, 1979) Transport Aircraft

The 747-100B is basically a 747SR series airplane with certain modifications to permit increases in maximum permissible operating weights.

| | |
|---|---|
| Engines: | 4 Pratt and Whitney JT9D-7A, JT9D-7F, or 4 Rolls Royce RB211-524B, RB211-524B2, RB211-524C2, RB211-524D4. See NOTE 5 regarding intermixing of engines. |
| Fuel: | See NOTE 3. |
| Engine Limits: | See data pertinent to all models. |
| Airspeed Limits: | VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual. |
| C.G. Range: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Weights: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Baggage/Cargo: | See the appropriate Weight and Balance Control and Loading Manual. |
| Fuel and Oil Capacity: | See the appropriate Weight and Balance Control and Loading Manual. |
| FAA Approved Weight and Balance Control and Loading Manual: | D6-13700 |
| FAA Approved Airplane Flight Manuals: | D6-13703, D6-35747 |

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--------------------------------|
| 747-146B | 22066, 22067, 23150 |
| 747-168B | 22498-22502, 22747-22749 |
| 747-186B | 21759 |

See NOTE 7.

VIII - 747-300 (Approved March 1, 1983) Transport Aircraft

The 747-300 is basically a 747-200 series airplane with a stretched upper deck.

| | |
|------------------------|--|
| Engines: | 4 Pratt and Whitney JT9D-7R4G2 or 4 General Electric CF6-50E2, CF6-80C2B1, or 4 Rolls Royce RB211-524B2, RB211-524C2, or RB211-524D4 See NOTE 5 regarding intermixing of engines. |
| Fuel: | See NOTE 3. |
| Engine Limits: | See data pertinent to all models. |
| Airspeed Limits: | VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual. |
| C.G. Range: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Weights: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Baggage/Cargo: | See the appropriate Weight and Balance Control and Loading Manual. |
| Fuel and Oil Capacity: | See the appropriate Weight and Balance Control and Loading Manual. FAA Approved Weight and Balance Control and Loading Manual: D6-13700 |

VIII. 747-300 (cont'd):

FAA Approved Airplane Flight Manuals: D6-13703, D6-33747, D6-35747

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--|
| 747-306 | 23056, 23137, 23508 |
| 747-312 | 23026-23033, 23243-23245, 23409, 23410, 23769 |
| 747-329 | 23439, 24837 |
| 747-337 | 24159, 24160 |
| 747-338 | 23222-23224, 23408, 23688, 23823 |
| 747-341 | 23394, 23395, 24106-24108 |
| 747-344 | 22970, 22971 |
| 747-346 | 23067, 23068, 23149, 23151, 23482, 23638-23640, 23967-23969, 24018, 24019, 24156 |
| 747-357 | 22704, 22705, 22995, 22996, 23751 |
| 747-366 | 24161, 24162 |
| 747-367 | 23221, 23392, 23534, 23709, 23920, 24215 |
| 747-368 | 23262-23271 |
| 747-3B3 | 22870, 23413, 23480 |
| 747-385 | 22487, 22489, 24194 |
| 747-3D7 | 23721, 23722 |
| 747-3G1 | 23070 |
| 747-3H6 | 23600 |

IX - 747-100B SUD (Approved March 24, 1986) Transport Aircraft

The 747-100B SUD is basically a 747-100B series airplane with a stretched upper deck.

| | |
|------------------------|--|
| Engines: | 4 Pratt and Whitney JT9D-7A See NOTE 5 regarding intermixing of engines. |
| Fuel: | See NOTE 3. |
| Engine Limits: | See data pertinent to all models. |
| Airspeed Limits: | VMO/MMO 375/0.92 (KEAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual. |
| C.G. Range: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Weights: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Baggage/Cargo: | See the appropriate Weight and Balance Control and Loading Manual. |
| Fuel and Oil Capacity: | See the appropriate Weight and Balance Control and Loading Manual. |

FAA Approved Weight and Balance Control and Loading Manual: D6-13700

FAA Approved Airplane Flight Manual: D6-13703

| <u>Model</u> | <u>Eligible Serial Numbers</u> | | | | | |
|--------------|--------------------------------|--|--|--|--|--|
| 747-146B SUD | 23390, 23637 | | | | | |

DATA PERTINENT TO ALL MODELS, EXCEPT MODEL 747-400 SERIES

| | | | | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| Engine Limits: (Pratt & Whitney) | <u>JT9D-3</u> | <u>JT9D-3A</u> | <u>JT9D-7</u> | <u>JT9D-7A</u> | <u>JT9D-7F</u> | <u>JT9D-7J</u> |
| Takeoff static thrust standard day, seal level conditions (in pounds); Dry (5 min) (Ideal) | 43,500 lbs. | 43,500 lbs. | 45,500 lbs. | 46,150 lbs. | 46,750 lbs. | 48,650 lbs. |

Data Pertinent to all Models, except Model 747-400 series (cont'd):

| | | | | | | |
|---|-----------------------------------|--|-----------------------------------|-------------------------------------|----------------------------------|----------------------------------|
| With water injection (2 1/2 min.) | 43,500 lbs. | 45,000 lbs. | 47,000 lbs. | 47,670 lbs. | 48,650 lbs. | |
| Maximum continuous static thrust, standard day, sea level condition: (Ideal) | <u>JT9D-3</u> 36,400 lbs. | <u>JT9D-3A</u> 36,400 lbs. | <u>JT9D-7</u> 39,650 lbs. | <u>JT9D-7A</u> 40,080 lbs. | <u>JT9D-7F</u> 39,200 lbs. | <u>JT9D-7J</u> 40,200 lbs. |
| Engine Limits: (Pratt & Whitney) Takeoff static thrust standard day, sea level conditions (in pounds) Dry (5 min) (Ideal) | <u>JT9D-70A</u> 51,140 lbs. | <u>JT9D-7Q</u> 51,100 lbs. | <u>JT9D-7Q3</u> 51,100 lbs. | <u>JT9D-7R4G2</u> 54,750 lbs. | | |
| Maximum continuous static thrust: standard day, sea level condition: (Ideal) | 44,290 lbs. | 44,290 lbs. | 44,290 lbs. | | 50,200 lbs. | |
| Engine Limits (General Electric) | | CF6-50E CF6-50E1 <u>CF6-50E2</u> | CF6-45A <u>CF6-45A2</u> | | <u>CF6-80C2B1</u> | |
| Engine thrust ratings: (Ideal) Takeoff (5 min) Maximum continuous | | 51,800 lbs. 46,300 lbs. | 45,600 lbs. 43,250 lbs. | | 55,980 lbs. | |
| Engine Limits: (Rolls Royce) Rated takeoff thrust (5 min.) Sea level static conditions (Ideal) Rated Maximum continuous thrust | | <u>RB211-524B</u> 49,120 lbs. | <u>RB211-524B2</u> 49,120 lbs. | | | |
| Engine Limits: (Rolls Royce) Rated takeoff thrust (5 min.) Sea level static conditions (Ideal) Rated Maximum continuous thrust | | <u>RB211-524C2</u> 50,600 lbs. | <u>RB211-524D4</u> 51,980 lbs. | | | |
| | | 44,780 lbs. | 44,780 lbs. | | | |
| | | 46,120 lbs. | 47,230 lbs. | | | |

For engine operating limits see the FAA Approved Airplane Flight Manual under the serial numbers section of this data sheet or the appropriate engine type certificate data sheet:

| | |
|------------------|-----------------|
| Pratt & Whitney | E3NE and E20EA |
| General Electric | E23EA and E13NE |
| Rolls Royce | E12EU |

Thrust Setting: The appropriate EPR or N1 thrust setting curve in Section 4 of the Airplane Flight Manual must be used for control of engine thrust.

Data Pertinent to all Models, except Model 747-400 series (cont'd):

| | |
|-------------------------------|---|
| Maximum Operating Altitude: | The maximum operating altitude is 45,100 feet. |
| Minimum Crew: | For all flights, 3 persons (pilot, copilot, flight engineer). When passengers are being carried, one attendant is required at each No. 3 over-wing exit. At least one flight attendant is required on the upper deck during taxi, takeoff and landing when passengers occupy the upper deck. |
| Maximum Passengers: | For 747SR and 747-100, -100B, -200B, -200C airplanes the total passenger capacity is limited to: 550 with 5 pair of Type "A" exits on main deck 440 with 4 pair of Type "A" exits on main deck Upper deck passenger capacity is limited to: 8 with one exit on the upper deck 16 with one exit, improved slide and smoke barrier 24 with one exit, straight stairway, smoke barrier, and escape slide capable of operation in 25 kt. wind 32 if in compliance with the requirements of Special Condition No. 25-61-NW-1 45 if in compliance with the requirements of Special Condition No. 25-71-NW-3 5 persons on upper deck per Exemption 1870D. (747-100 and 747-200) For 747SP the total passenger capacity is limited to: 400 passengers with the same upper deck limits as listed above. For 747-200F the total passenger capacity is limited to: 19 passengers on upper deck with 2 doors, 25 knot slides, C.G. Limitation, and compliance shown with AD 93-07-15; or 19 persons on upper deck equipped with emergency descent reels and harnesses, 2 doors and 25 knot slides. 5 persons on upper deck per Exemption 1870D. For 747-300 and 747-100B SUD the total passenger capacity is limited to: 660 passengers with 5 pair of Type "A" exits on the main deck plus one pair of Type "A" exits on the upper deck. Main deck limited to 550 and upper deck limited to 110 if in compliance with the requirements of modified Special Condition No. 25-71-NW-3, transmitted to Boeing by FAA letter dated August 3, 1981.) See NOTE 9. 550 passengers with 4 pair of Type "A" exits on the main deck limited to 440 and upper deck limited to 110 if in compliance with the requirements of modified Special Condition No. 25-71-NW-3, transmitted to Boeing by FAA letter dated August 3, 1981. |
| Required Equipment: | The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data. |
| Datum: | Balance Arm Datum corresponds to Body Station 0 and is 90 inches (290 inches on SP) forward of nose. All production stations coincide numerically with arms except on 747SP. Horizontal distance of datum to nose gear jack points in 384.7 inches. (584.7 inches on 747SP) |
| Mean Aerodynamic Chord (MAC): | MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum. |
| Level Means: | A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0. They are referred to as ARM on the 747SP and are a true measure in inches aft of a forward reference datum which is located 290 inches ahead of the airplane nose. |

Data Pertinent to all Models, except Model 747-400 series (cont'd):

Balance ARMS have the following relationship with Body Stations on the 747SP:

| BODY STATION INCHES | ADJUSTMENT INCHES | ARM INCHES |
|---|----------------------|----------------|
| 90 to 800 (800 to 1,000 Section removed) | +200 | 290 to 1,000 |
| 1,000 to 1,480 (1,480 to 1,640 Section removed) | 0 | 1,000 to 1,480 |
| 1,640 to 2,140 (2,140 to 2,360 Section removed) | -160 | 1,480 to 1,980 |
| 2,360 to 2,792 | -380 | 1,980 to 2,412 |

Control Surface
Movements:

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

| Boeing Drawing Numbers | | |
|------------------------|----------------------|---------------------|
| 65B04001 | Control Installation | Aileron and Spoiler |
| 65B04002 | Control Installation | Elevator |
| 65B04003 | Control Installation | Rudder |
| 65B04004 | Control Installation | Stabilizer Trim |
| 65B04006 | Control Installation | Rudder Trim |
| 65B04007 | Control Installation | Wing Flap |
| 65B04016 | Control Installation | Speed Brakes |

Service Information:

Boeing Reports D6-13592, "Structural Repair Manual", (except for 747SP) is FAA-Approved. Boeing Reports D6-34024, "Structural Repair Manual", is FAA-Approved for the 747SP. Service Bulletins and other service information, when FAA-Approved, will carry a statement to the effect.

Certification Basis:

FAR Part 1, FAR Part 21, FAR Part 36, FAR Part 25 effective February 1, 1965, Amendments 25-1 through 25-8 plus 25-15, 25-17, 25-18, 25-20, and Amendment 25-39 transmitted by FAA letter dated February 4, 1977, and special conditions summarized for record purposes as enclosed with FAA letter to The Boeing Company dated February 20, 1970. Special Condition 4A, revised to apply to airplanes with the landing gear load evener system deleted, was recorded as attachment to an FAA letter to The Boeing Company dated May 12, 1971.

Amendment 25-46, Section 25.803(d) transmitted by FAA letter to The Boeing Company dated September 2, 1983. This is limited to all passenger configurations and 6/7 pallet combi configurations for Model 747-100, -200, and -300 series airplanes.

Special Condition No. 25-61-NW-1 for occupancy not to exceed 32 passengers on the upper deck of airplanes with spiral staircase was transmitted to The Boeing Company by FAA letter dated February 26, 1975.

Special Condition No. 25-71-NW-3 for occupancy not to exceed 45 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated September 8, 1976.

Modification of Special Condition No. 25-71-NW-3 for occupancy not to exceed 110 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated August 3, 1981.

RB211 engine oil filter system complies with FAR 25.1019 and 25.1305(c)(7) of Amendment 25-36.

Data Pertinent to all Models, except Model 747-400 series (cont'd):

Special Condition No. 25-77-NW-4 (modification of the autopilot system to approve the airplane for use of the system under category IIIb landing conditions) was transmitted to The Boeing Company by FAA letter dated July 8, 1977.

Special Condition No. 25-ANM-16 for installation of an overhead crew rest area, occupancy not to exceed 10 crewmembers. FAA approved procedures required for compliance with paragraph 13 of the Special Condition are located in Boeing Document D926U303, Appendix D.

Exemptions from FAR Part 25: No. 1013A dated December 24, 1969 - Exemption from FAR 25.471(b) - to allow lateral displacement of the C.G. from the airplane centerline.

Exemption No. 1870D dated April 3, 1991, allows non-crewmembers on the upper deck of 747-200F, 747-200C, and certain 747-100 airplanes when in the main deck cargo configuration.

Exemption No. 3035 dated September 9, 1980 - Exemption from section 25.1301(a) and 37.120(a) of the Federal Aviation Regulations - To permit the type certification of specified Boeing Model 747-206B airplanes with: (1) location of the flap position indicator in the lower left-hand corner of the pilot's center instrument panel and (2) servo altimeters configured with dial markings at 50-foot increments. This exemption is subject to the following conditions: (1) It is valid only for airplanes with serial numbers 22376, 22379, and 22380. (2) The type certificate must contain an operating limitation that it is valid only for airplanes being operated by KLM Royal Dutch Airlines with crews trained in the specific configuration.

Compliance with the following optional requirements has been established:

| | |
|---------------------------|-------------|
| Ditching Provisions | FAR 25.801 |
| Ice Protection Provisions | FAR 25.1419 |

Equivalent Safety Findings exist with respect to the following Regulations:

For Model 747-100, -200B, -200F, -200C, 747SR, 747SP, -100B, -300, -100B SUD:
25.1415(d) Emergency Locator Transmitter (ELT)

For 747-300 only:
25.812(k)(2)
25.815

For Model 747-100, -200, -300 Series:
25.773(b)(2)(i), Amendments 25-1 through 25-67
25.811(f) Emergency Exit Marking

Production Basis: Production Certificate No. 700.

Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed.

X - 747-400 (Approved January 10, 1989) Transport Aircraft

The 747-400 is basically 747-300 series airplane with wing extension and winglets, additional fuel tank in the horizontal stabilizer and reconfigured cockpit for two man crew and associated automation and advanced avionics.

| | |
|----------|---|
| Engines: | 4 Pratt and Whitney PW4000 Series, General Electric CF6-80C2B1F, CF6-80C2B5F; or Rolls Royce RB211-524G/H, RB211-524G/H-T SEE NOTE 5 regarding intermixing engines |
|----------|---|

Engine Thrust Limits: See data pertinent to all Model 747-400's

Fuel: See NOTE 3.

X. 747-400 (cont'd):

Airspeed Limits: VMO/MMO 365/0.92 (KCAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual.

C.G. Range: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Weights: See the appropriate FAA Approved Airplane Flight Manual.

Maximum Baggage/Cargo: See the appropriate Weight and Balance Control and Loading Manual.

Fuel/Oil Capacity: See the appropriate Weight and Balance Control and Loading Manual.

FAA Approved Weight and Balance Control and Loading Manual: D043U400

FAA Approved Airplane Flight Manuals: D6-U10001, D6-U10002, and D6-U10003

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|---|
| 747-406 | 23982, 23999-24001, 24201, 24202, 24517, 24518, 25086, 25087, 25356, 25413, 26372-26374, 27202, 28195, 28196, 28459, 28460, 30454 |
| 747-409 | 24309-24313, 27965, 28709-28712, 29030, 29031, 29219, 29906 |
| 747-412 | 24061-24066, 24226, 24227, 24975, 25068, 25127, 25128, 26547-26552, 26554-26557, 26562, 27066-27070, 27132-27134, 27137, 27178, 27217, 28022, 28023, 28025, 28028, 28029, 28031, 28032, 29950 |
| 747-419 | 24386, 24855, 25605, 26910, 29375 |
| 747-422 | 24322, 24363, 24380-24385, 25158, 25224, 25278, 25279, 25379, 25380, 25395, 26875-26881, 26890, 26892, 26899, 26900, 26901, 26902, 26903, 26906, 26908, 28715, 28716, 28717, 28810, 28811, 28812, 28813, 29166, 29167, 29168, 30023 |
| 747-428 | 24969, 24990, 25238, 25302, 25344, 25599-25602, 25628-25630 |
| 747-430 | 23816, 23817, 24285-24288, 24715, 24740, 24741, 24761, 24966, 24967, 25045-25047, 26425-26427, 28086, 28284-28287, 29101, 29492, 29493, 29868-29872, 32445 |
| 747-433 | 24998, 25074, 25075 |
| 747-436 | 23908-23911, 24047-24058, 24447, 24629, 24630, 25406, 25427, 25432, 25434, 25435, 25809, 25810-25814, 25817-25824, 27090-27092, 27349, 27350, 27478, 28700, 28848-28859, |
| 747-437 | 27078, 27164, 27165, 27214, 28094, 28095 |
| 747-438 | 24354, 24373, 24406, 24481-24483, 24779, 24806, 24887, 24974, 25067, 25151, 25245, 25315, 25544-25547, 25565, 25566 |
| 747-439 | 25564 |
| 747-441 | 24956, 24957 |
| 747-443 | 32337-32340, 30885 |
| 747-444 | 24976, 25152, 26637, 26638, 28468, 29119 |
| 747-446 | 24423-24427, 24777, 24784, 24870, 24885, 24886, 25064, 25212, 25260, 25308, 26341-26344, 26346, 26350, 26353, 26355, 26356, 26359, 26360, 26361, 26362, 27100, 27645, 27646, 27648, 27650, 29899 |
| 747-451 | 23719, 23720, 23818-23821, 24222-24225, 26473, 26474, 26477, 30267, 30268, 30269, 33001 |
| 747-458 | 26055, 26056, 27915, 29328 |
| 747-467 | 23814, 23815, 24631, 24850, 24851, 24925, 24955, 25082, 25211, 25351, 25869-25874, 27117, 27230, 27595 |
| 747-468 | 28339-28343 |
| 747-469 | 27338, 27663 |
| 747-475 | 24883, 24895, 24896, 25422 |
| 747-481 | 24801, 24833, 24920, 25135, 25207, 25641, 25645, 28282, 28283, 29262, 29263, 30322 |
| 747-41R | 29406, 32745 |
| 747-45E | 26062, 27062, 27063, 27141, 27142, 27154, 27173, 27174, 27898, 27899, 28092, 28093, 29061 29111, 29112 |
| 747-47C | 24730, 24731 |
| 747-48E | 25405, 25452, 25777-25780, 25782, 25784, 28551, 28552 |
| 747-4B3 | 24154, 24155 |
| 747-4B5 | 24198-24200, 24619, 24621, 25205, 25275, 26392-26398, 26400, 26402-26405, 26407, 26409, 26412, 27072, 27177, 27341, 27662, 28096, 28335 |
| 747-4D7 | 24458, 24459, 24993, 25366, 26609, 26610, 26615, 26616, 27093, 27723- 27725, 28705, 28706, 32369-32370 |

X. 747-400 (cont'd):

| | |
|---------|---|
| 747-4F6 | 27261, 27262, 27602, 27827, 27828, 28959, 28960, 28961 |
| 747-4H6 | 24315, 24405, 24836, 25126, 25699-25703, 27042-27044, 27672, 28426, 28427, 28428, 28432, 28433, 28435, 29900, 30158 |
| 747-4J6 | 24346-24348, 25879-25883, 28754, 28755, 28756, 29070, 29071, 30158 |
| 747-4Q3 | 29486 |
| 747-4Q8 | 24958, 26255, 26326, 28194, 28757 |
| 747-4U3 | 25704, 25705 |

For engine operating limits see the FAA Approved Airplane Flight Manual referenced under Section X of this data sheet or the appropriate engine type certificate data sheet:

| | |
|--------------------|-------|
| Pratt and Whitney: | E24NE |
| General Electric: | E13NE |
| Rolls Royce: | E30NE |

Thrust Setting: The appropriate EPR or N1 thrust setting curves in Section 4 of the Airplane Flight Manual (AFM) must be used for control of engine thrust.

Maximum Operating Altitude: 45,100 feet

Minimum Crew: For all flights, 2 persons (pilot, copilot). When passengers are being carried, one attendant is required at each No. 3 over-wing exit. At least one flight attendant is required on the upper deck during taxi, takeoff, and landing when passengers occupy the upper deck.

Maximum Passengers: For 747-400 the total passenger capacity is limited to:

660 passengers with 5 pair of Type "A" exits on main deck plus one pair of Type "A" exits on the upper deck. (Main deck limited to 550 and upper deck limited to 110 if in compliance with the requirements of modified Special Condition Number 25-71-NW-3, transmitted to Boeing by FAA letter dated August 3, 1981.) See NOTE 9.

Required Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data.

Datum: Balance Arm Datum corresponds to Body Station 0 and is 90 inches forward of nose. All production stations coincide numerically with arms. Horizontal distance of datum to nose gear jack points is 384.7 inches.

MAC: MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum.

Level Means: A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0.

Control Surface Movements: To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

| | |
|-------------------------|--|
| Boeing Drawing Numbers: | |
| 251U1001 | Rigging Procedures Aileron and Spoiler |
| 251U2001 | Rigging Procedures Elevator |
| 251U3002 | Rigging Procedures Rudder |
| 251U4001 | Rigging Procedures Stabilizer Trim |
| 253U5001 | Rigging Procedure - Control Stand (Includes flap control assembly) |
| 256U2001 | Rigging Procedures Leading Edge Flaps |
| 256U3001 | Rigging Procedures Trailing Edge Flaps |
| 251U1003 | Rigging Procedures Speed Brakes |

X. 747-400 (cont'd):

Service Information: Boeing Report D6-34U102, "Structural Repair Manual," is FAA-approved. Service Bulletins and other Service information, when FAA-approved, will carry a statement to that effect.

Certification Basis: Part 25 of the FAR, effective February 1, 1965, as amended by Amendments 25-1 through 25-59 with the following exceptions:

| <u>SECTION NO.</u> | <u>TITLE</u> | <u>THRU AMDT.25-</u> |
|--------------------|--|----------------------|
| 25.107 | Takeoff speeds | 41 |
| 25.109 | Accelerate-stop distance | 41 |
| 25.149 | Minimum control speed | 41 |
| 25.251 | Vibration and buffeting | 22 |
| 25.305 | Strength and deformation | 22 |
| 25.331 | General | 45 |
| 25.351 | Yawing conditions | 45 |
| 25.365 | Pressurized cabin loads | 53 |
| 25.571 | Damage-tolerance and fatigue evaluation of structure | 9 |
| 25.607 | Fasteners | 22 |
| 25.631 | Bird Strike damage | (NA)** |
| 25.657 | Hinges | 22 |
| 25.675 | Stops | 37 |
| 25.683 | Operation tests | 22 |
| 25.772 | Pilot compartment doors | 46 |
| 25.783 | Doors | 53 |
| 25.785 | Seats, berths, safety belts, harnesses | 50 |
| 25.787 | Stowage Compartments | 31 |
| 25.789 | Retention of items of mass in passenger and crew compartments | 45 |
| 25.809 | Emergency exit arrangement | 45 |
| 25.812 | Emergency lighting | 31 |
| 25.832 | Cabin ozone concentration | (NA)** |
| 25.858 | Cargo compartment fire detections systems | (NA)** |
| 25.1103 | Induction system ducts and air duct systems | 45 |
| 25.1401 | Anticollision light system | 26 |
| 25.1438 | Pressurization and pneumatic systems | (NA)** |
| 25.1529 | Instructions for continued airworthiness | (NA)** |

***Not applicable - The requirements of this section do not apply to this type design because the original certification basis, which did not include this section, has been determined to be adequate.*

Part 36 of the FAR as amended by Amendments 36-1 through 36-15, and any later amendments in existence at the time of certification.

Special Federal Aviation Regulation (SFAR) 27, as amended by Amendments 27-1 through 27-6 and any later amendments in existence at the time of type certification.

The following special conditions, exemptions; and equivalent safety findings, which are part of the Model 747-300 certification basis, are also part of the certification basis for the Model 747-400.

The special conditions include those enclosed with FAA letter to The Boeing Company dated February 20, 1970, and the following:

1. Special Condition 4A, revised to apply to airplanes with the landing gear load evener system deleted, was recorded as an enclosure to an FAA letter to The Boeing Company dated May 12, 1971.
2. Special Condition No. 25-61-NW-1 for occupancy not to exceed 32 passengers on the upper deck of airplanes with spiral staircase was transmitted to The Boeing Company by FAA letter dated February 26, 1975.

X. 747-400 (cont'd):

3. Special Condition No. 25-71-NW-3 for occupancy not to exceed 45 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated September 8, 1976.
4. Modification of Special Condition No. 25-71-NW-3 for occupancy not to exceed 110 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated August 3, 1981.
5. Special Condition No. 25-77-NW-4 (modification of the auto pilot system to approve the airplane for use of the system under Category IIIb landing conditions) was transmitted to The Boeing Company by FAA letter dated July 8, 1977.
6. Special Condition No. 25-ANM-16 for use of an overhead crew rest area, occupancy not to exceed ten crewmembers was transmitted to The Boeing Company by FAA letter dated November 19, 1987. FAA approved procedures required for compliance with paragraph 13 of the Special Condition are located in Boeing Document D926U303, Appendix D.
7. Special Condition No. 25-ANM-24 applicable to flight deck displays and propulsion control system was provided to Boeing on December 22, 1988.
8. Special Condition No. 25-ANM-25 which established lightning and radio frequency (RF) energy protection requirements was provided to Boeing on December 22, 1988.

Exemptions from FAR Part 25:

No. 1013A dated December 24, 1969 - Exemption from Section 25.471(b) to allow lateral displacement of the C.G. from the airplane centerline.

The following optional requirements, which are part of the Model 747-300 certification basis, apply also to the 747-400:

| | |
|---------------------------|-----------------|
| Ditching Provisions | Section 25.801 |
| Ice Protection Provisions | Section 25.1419 |

The following equivalent safety findings, previously made for earlier models under the provisions of Section 21.21(b)(1), are also applicable to the Model 747-400:

| | |
|---|---|
| Width of Aisle | Section 25.815 |
| Pilot Compartment View | Section 25.773 |
| Use of 1-g Stall Speed (nonstructural items) | Several (747-400 only) |
| Use of 1-g Stall Speed (structural items) | Several (747-400 only) |
| Position Light Distribution and Intensities | Section 25.1389(b)(3) (747-400 only) |
| Fire-detection System | Section 25.1203 See Note 1. |
| Pressure Relief | Section 25.1103(d) See Note 1. |
| Emergency Locator Transmitter (ELT) | Section 25.1415(d) |

XI. 747-400D (cont'd):

Thrust Setting: The appropriate EPR or N1 thrust setting curves in Section 4 of the Airplane Flight Manual (AFM) must be used for control of engine thrust.

Maximum Operating Altitude: 45,100 feet

Minimum Crew: For all flights, 2 persons (pilot, copilot). When passengers are being carried, one attendant is required at each No. 3 over-wing exit. At least one flight attendant is required on the upper deck during taxi, takeoff, and landing when passengers occupy the upper deck.

Maximum Passengers: For 747-400D airplanes the total passenger capacity is Limited to:

660 passengers with 5 pair of Type "A" exits on main deck plus one pair of Type "A" exits on the upper deck. (Main deck limited to 550 and upper deck limited to 110 if in compliance with the requirements of modified Special Condition Number 25-71-NW-3, transmitted to Boeing by FAA letter dated August 3, 1981).

Required Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data.

Datum: Balance Arm Datum corresponds to Body Station 0 and is 90 inches forward of nose. All production stations coincide numerically with arms. Horizontal distance of datum to nose gear jack points is 384.7 inches.

MAC: MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum.

Level Means: A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0.

Control Surface Movements: To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

Boeing Drawing Numbers:

| | | |
|----------|--------------------|--|
| 251U1001 | Rigging Procedures | Aileron and Spoiler |
| 251U2001 | Rigging Procedures | Elevator |
| 251U3002 | Rigging Procedures | Rudder |
| 251U4001 | Rigging Procedures | Stabilizer Trim |
| 253U5001 | Rigging Procedures | Control Stand (includes flap control assembly) |
| 256U2001 | Rigging Procedures | Leading Edge Flaps |
| 256U3001 | Rigging Procedures | Trailing Edge Flaps |
| 251U1003 | Rigging Procedures | Speed Brakes |

Service Information: Boeing Report D6-34U102, "Structural Repair Manual," is FAA-approved. Service Bulletins and other Service information, when FAA-approved, will carry a statement to that effect.

Certification Basis: Part 25 of the FAR, effective February 1, 1965, as amended by Amendments 25-1 through 25-70 with the following exceptions:

| <u>SECTION NO.</u> | <u>TITLE</u> | <u>THRU AMDT.25-</u> |
|--------------------|--------------------------|----------------------|
| 25.107 | Takeoff speeds | 41 |
| 25.109 | Accelerate-stop distance | 41 |
| 25.149 | Minimum control speed | 41 |
| 25.251 | Vibration and buffeting | 22 |
| 25.305 | Strength and deformation | 22 |
| 25.331 | General | 45 |
| 25.351 | Yawing conditions | 45 |
| 25.365(g) | Pressurized cabin loads | 53 |

XI. 747-400D (cont'd):

| | | |
|---------|---|--------|
| 25.561 | General | 63 |
| 25.562 | Emergency landing dynamic conditions | 63** |
| 25.571 | Damage-tolerance and fatigue evaluation of structure | 9 |
| 25.607 | Fasteners | 22 |
| 25.631 | Bird strike damage | (NA)** |
| 25.657 | Hinges | 22 |
| 25.675 | Stops | 37 |
| 25.683 | Operation tests | 22 |
| 25.772 | Pilot compartment doors | 46 |
| 25.783 | Doors | 53 |
| 25.785 | Seats, berths, safety belts, harnesses | 50 |
| 25.809 | Emergency exit arrangement | 45 |
| 25.812 | Emergency lighting | 31 |
| 25.855 | Cargo or baggage compartments | 59 |
| 25.858 | Cargo Compartment Fire Detection Systems | (NA)** |
| 25.1103 | Induction system ducts and air duct systems | 45 |
| 25.1401 | Anticollision light system | 26 |
| 25.1438 | Pressurization and pneumatic systems | (NA)** |
| 25.1529 | Instructions for continued airworthiness | (NA)** |

** Not applicable - The requirements of this section do not apply to this type design because the original certification basis, which did not include this section, has been determined to be adequate.

Part 36 of the FAR as amended by Amendments 36-1 through 36-18, and any later amendments in existence, at the time of certification.

Special Federal Aviation Regulation (SFAR) 27, as amended by Amendments 27-1 through 27-6, and any later amendments in existence, at the time of certification

The following special conditions, exemptions, and equivalent safety findings, which are part of the Model 747-300 certification basis, are also part of the certification basis for the Model 747-400D:

The special conditions include those enclosed with FAA letter to The Boeing Company dated February 20, 1970, and the following:

1. Special Condition 4A, revised to apply to airplanes with the landing gear load evener system deleted, was recorded as an enclosure to an FAA letter to The Boeing Company dated May 12, 1971.
2. Special Condition No. 25-61-NW-1 for occupancy not to exceed 32 passengers on the upper deck of airplanes with spiral staircase was transmitted to The Boeing Company by FAA letter dated February 26, 1975.
3. Special Condition No. 25-71-NW-3 for occupancy not to exceed 45 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated September 8, 1976.
4. Modification of Special Condition No. 25-71-NW-3 for occupancy not to exceed 110 passengers on the upper deck of airplanes with straight segmented stairway was transmitted to The Boeing Company by FAA letter dated August 3, 1981.
5. Special Condition No. 25-77-NW-4 (modification of the auto pilot system to approve the airplane for use of the system under Category IIb landing conditions) was transmitted to The Boeing Company by FAA letter dated July 8, 1977.
6. Special Condition No. 25-ANM-16 for use of an overhead crew rest area, occupancy not to exceed ten crewmembers was transmitted to The Boeing Company by FAA letter dated November 19, 1987.

XI. 747-400D (cont'd):

7. Special Condition No. 25-ANM-24 applicable to flight deck displays and propulsion control system was provided to Boeing on December 22, 1988. FAA approved procedures required for compliance with paragraph 13 of the Special Condition are located in Boeing Document D926U303, Appendix D.
8. Special Condition No. 25-ANM-25 which established lightning and radio frequency (RF) energy protection requirements was provided to Boeing on December 22, 1988.

Exemptions from FAR Part 25:

No. 1013A dated December 24, 1969 - Exemption from Section 25.471(b) to allow lateral displacement of the C.G. from the airplane centerline.

The following Optional requirements, which are part of the Model 747-300 certification basis, apply also to the 747-400D:

| | |
|---------------------------|----------------|
| Ditching Provisions | Section 25.801 |
| Ice Protection Provisions | Section 25.773 |

The following equivalent safety findings, previously made for earlier models under the provisions of Section 21.21(b)(1), are also applicable to the Model 747-400D:

| | |
|---|-----------------------|
| Width of Aisle | Section 25.815 |
| Pilot Compartment View | Section 25.773 |
| Use of 1-g Stall Speed (nonstructural items) | Several |
| Use of 1-g Stall Speed (structural items) | Several |
| Position Light Distribution and Intensities | Section 25.1389(b)(3) |
| Emergency Locator Transmitter (ELT) | Section 25.1415(d) |
| Emergency Exit Markings | Section 25.811(f) |

Part 25 of the FAR, effective February 1, 1965, as amended by Amendment 25-1 through 25-59 with the following exceptions: (*See Note 15*)

Certification Maintenance Requirements (CMR's):

The CMR's are listed in the FAA-approved Section 9 of Boeing Maintenance Planning Data Document D6-21U400 or the applicable engine Type Certificate Data Sheet. The more restrictive requirements from these two documents shall be in force.

Production Basis: Production Certificate No. 700.

Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft.

Note:

The Boeing Company has offered and the FAA has agreed, to upgrade the certification basis for the Model 747-400D in relation to FAR Part 25.365 (Amendment 25-54), Pressurized Cabin Loads on the condition that initial deliveries need not comply at the time of delivery, but shall be retrofitted later.

By March 31, 1993, Model 747-400D production airplanes must include an FAA-approved production change which demonstrates compliance with the Certification Basis. Retrofit modification kits will also be available (beginning June 30, 1993) for installation in airplanes delivered without the production change (S/N's 25213, 25214, 25292, 25639, 25640, 25642 & 26347).

XII - 747-400F (Approved October 14, 1993) Transport Aircraft

The new 747-400F (Freighter) is basically the 747-400 series airplane with strengthened wings and the 747-200F fuselage.

| | |
|---|--|
| Engines: | 4 Pratt & Whitney PW4000 Series, 4 General Electric CF6-80C2B1F, CF6-80C2B5F; or 4 Rolls-Royce RB211-524G/H, RB211-525G/H-T |
| Engine Thrust Limits: | See data pertinent to all Model 747-400's |
| Fuel: | See NOTE 3. |
| Airspeed Limits: | VMO/MMO 365/0.92 (KCAS) For other airspeed limits see the appropriate FAA Approved Airplane Flight Manual. |
| C.G. Range: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Weights: | See the appropriate FAA Approved Airplane Flight Manual. |
| Maximum Baggage/Cargo: | See the appropriate Weight and Balance Control and Loading Manual. |
| Fuel and Oil Capacity: | See the appropriate Weight and Balance Control and Loading Manual. |
| FAA Approved Weight and Balance Control and Loading Manual: | D043U550 |
| FAA Approved Airplane Flight Manual: | D6U10001, D6U10002 and D6U10003 |

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|---|
| 747-409F | 30759-30766 |
| 747-412F | 26553, 26558-26561, 26563, 28026, 28027,28030, 28032, 28263 |
| 747-428F | 25632 |
| 747-467F | 27175, 27503, 30804, 30805, 32571 |
| 747-4B5F | 26401, 26406, 26408, 26411, 26413, 26414, 26416, 27073 |
| 747-4G4F | 30201 |
| 747-4R7F | 25866, 25867, 25868, 29053, 29729-29733, 30400 |
| 747-45EF | 30607, 30608 |
| 747-46NF | 30808-30811 |
| 747-47UF | 29252-29261, 30558, 30559 |
| 747-48EF | 25781, 25783, 27603, 28367 |

For engine operating limits see the FAA Approved Airplane Flight Manual referenced under Section XII of this data sheet or the appropriate engine type certificate data sheet:

| | |
|-------------------|-------|
| Pratt & Whitney | E24NE |
| General Electric: | E13NE |
| Rolls-Royce | E30NE |

| | |
|-----------------------------|--|
| Thrust Setting: | The appropriate EPR or N1 thrust setting curves in Section 4 of the Airplane Flight Manual (AFM) must be used for control of engine thrust. |
| Maximum Operating Altitude: | 45,100 feet |
| Minimum Crew: | For all flights, 2 persons (pilot, copilot). |
| Maximum Persons: | For 747-400F airplanes the total persons capacity is Limited to: Six (6) persons on the upper deck per Exemption 1870E |
| Required Equipment: | The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data. |

XII. 747-400F (cont'd):

Datum: Balance Arm Datum corresponds to Body Station 0 and is 90 inches forward of nose. All production stations coincide numerically with arms. Horizontal distance of datum to nose gear jack points is 384.7 inches.

MAC: MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum.

Level Means: A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0.

Control Surface Movements: To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

Boeing Drawing Numbers:

| | | |
|----------|------------------------------------|----------------------------------|
| 251U1001 | Rigging Procedures | Aileron and Spoiler |
| 251U2001 | Rigging Procedures | Elevator |
| 251U3002 | Rigging Procedures | Rudder |
| 251U4001 | Rigging Procedures | Stabilizer Trim |
| 253U5001 | Rigging Procedures - Control Stand | (includes flap control assembly) |
| 256U2001 | Rigging Procedures | Leading Edge Flaps |
| 256U3001 | Rigging Procedures | Trailing Edge Flaps |
| 251U1003 | Rigging Procedures | Speed Brakes |

Service Information: Boeing Report D6-34U102, "Structural Repair Manual," is FAA-approved. Service Bulletins and other Service Information, when FAA-approved, will carry a statement to that effect.

: Part 25 of the FAR, effective February 1, 1965, as amended by Amendments 25-1 through 25-67 with the following exceptions:
(See Note 14 for cargo compartment liner requirements)

| <u>SECTION NO.</u> | <u>TITLE</u> | <u>THRU AMDT.25-</u> |
|--------------------|--|----------------------|
| 25.107 | Takeoff speeds | 41 |
| 25.109 | Accelerate-stop distance | 41 |
| 25.149 | Minimum control speed | 41 |
| 25.251 | Vibration and buffeting | 22 |
| 25.305 | Strength and deformation | 22 |
| 25.331 | General | 45 |
| 25.351 | Yawing conditions | 45 |
| 25.365(g) | Pressurized Compartment Loads | 53 |
| 25.562 | Emergency landing dynamic conditions | 63** |
| 25.571 | Damage-tolerance and fatigue evaluation of structure | 9 |
| 25.607 | Fasteners | 22 |
| 25.631 | Bird strike damage | 22 |
| 25.657 | Hinges | 22 |
| 25.675 | Stops | 37 |
| 25.683 | Operation tests | 22 |
| 25.772 | Pilot compartment doors | 46 |
| 25.783 | Doors | 53 |
| 25.809(f)(1)(v) | Emergency exit arrangement | 45 |
| 25.812 | Emergency lighting | 31 |
| 25.858 | Cargo Compartment Fire Detection Systems | (NA)** |
| 25.1103 | Induction system ducts and air duct systems | 45 |
| 25.1401 | Anticollision light system | 26 |
| 25.1438 | Pressurization and pneumatic systems | (NA)** |
| 25.1529 | Instructions for continued airworthiness | (NA)** |

**Not Applicable - The requirements of this section do not apply to this type design because the original certification basis, which did not include this section, has been determined to be adequate.

XII. 747-400F (cont'd):

Part 36 of the FAR as amended by Amendments 36-1 through 36-20.

Special Federal Aviation Regulation (SFAR) 27, as amended by Amendments 27-1 through 27-7. (Same as FAR Part 34, October 14, 1993)

The following special conditions, exemptions, and equivalent safety findings, which are part of the Model 747-200F and 747-400 certification basis, are also part of the certification basis for the Model 747-400F:

The special conditions include those enclosed with FAA letter to The Boeing Company dated February 20, 1970, and the following:

1. Special Condition 4A, revised to apply to airplanes with the landing gear load evener system deleted, was recorded as an enclosure to an FAA letter to The Boeing Company dated May 12, 1971.
- 2, 3, and 4 were removed in this Revision 27, dated August 1, 1996
5. Special Condition No. 25-77-NW-4 (modification of the auto pilot system to approve the airplane for use of the system under Category IIIb landing conditions) was transmitted to The Boeing Company by FAA letter dated July 8, 1977.
- 6 was removed in this Revision 27, dated August 1, 1996
7. Special Condition No. 25-ANM-24 applicable to flight deck displays and propulsion control system was provided to Boeing on December 22, 1988.
8. Special Condition No. 25-ANM-25 which established lightning and radio frequency (RF) energy protection requirements was provided to Boeing on December 22, 1988.

Exemptions from FAR Part 25:

- No. 1013A dated December 24, 1969 - Exemption from Section 25.471(b) to allow lateral displacement of the C.G. from the airplane centerline.

New Exemption for 747-400F:

- No. 1870E dated September 8, 1993, allows maximum of six (6) non-crew members on the upper deck.
 No. 5649 dated April 27, 1993, exempts latches on the decompression vent doors from meeting 25.855(c).

The following optional requirements, which are part of the Model 747-400 certification basis, apply also to the 747-400F:

| | |
|---------------------------|----------------|
| Ditching Provisions | Section 25.801 |
| Ice Protection Provisions | Section 25.773 |

The following equivalent safety findings (ESF), previously made for earlier models under the provisions of Section 21.21(b)(1), are also applicable to the Model 747-400F:

| | |
|---|-----------------------|
| Width of Aisle | Section 25.815 |
| Pilot Compartment View | Section 25.773 |
| Use of 1-g Stall Speed (nonstructural items) | Several |
| Use of 1-g Stall Speed (structural items) | Several |
| Position Light Distribution and Intensities | Section 25.1389(b)(3) |
| Emergency Locator Transmitter (ELT) | Section 25.1415(d) |
| Emergency Exit Marking | Section 25.811(f) |

XII. 77-400F (cont'd):

New ESF for 747-400F:

Doors Section 25.783(e)

Part 25 of the FAR, effective February 1, 1965, as amended by Amendment 25-1 through 25-59 with the following exceptions: (*See Note 15*).

Certification Maintenance Requirements (CMR's):

The CMR's are listed in the FAA-approved Section 9 of Boeing Maintenance Planning Data Document D621U400 or the applicable engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

Production Basis: Production Certificate No. 700.

Equipment: The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.

DATA PERTINENT TO ALL MODEL 747-400 SERIES:

| | | | | |
|--|--------|-------------|------------|-------------|
| Engine Models: | PW4056 | CF6-80C2B1F | RB211-524G | RB211-524H |
| Thrust Limits: | | | RB211-52G2 | RB211-424H2 |
| Take Off-Sea Level, statstandard day (5 minutes) | | | RB211-52G3 | |
| | 56,750 | 57,160 | 56,870 | 59,450 |
| | 50,200 | 49,800 | 47,230 | 47,230 |
| | lbs. | lbs. | lbs. | lbs. |

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED

- NOTE 1. A current Weight and Balance Supplement including a list of equipment included in certificated weight empty and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an approved weight control system.
- NOTE 2. Airplane operation must be in accordance with the FAA Approved Airplane Flight Manual. All placards required by either the FAA Approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane.
- NOTE 3. The following fuels are eligible for Pratt and Whitney engines: JP-1, JP-4, and JP-5 fuels conforming to the P&WA Specification No. 522E or later revision may be used separately or mixed in any proportion without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

G.E. engines use fuels conforming to G.E. Spec. D50TF2. MIL-T-5624, Grades JP-4 or JP-5, and ASTM D1655, Jet A, Jet A1, and Jet 8 are consistent with G.E. Specifications. [JP-8 is also approved for use in CF6-80C2 Series engines.] CF-80C2 series engines incorporating Dribble Flow Fuel Nozzles PN 9331M72P33, P34 and P41 are prohibited from the use of JP-4 and Jet B (wide cut) fuel.

The following fuels are eligible for Rolls Royce RB211-524 Series engines:

| Grade (Type) | Specification |
|---------------------------------|---|
| Kerosene,(Type) (AVTUR:JP-1) | D. Eng. R.D. 2453 D. Eng. R.E. 2494 A.S.T.M. D1655 Jet A A.S.T.M. D1655 Jet A-1 3-GP-23 I.A.T.A. Kerosene Type |

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED (cont'd):

| | |
|----------------------------------|--|
| Wide Cut Fuels (AVTAG:JP-4) | D. Eng. R.D. 2454 D. Eng. R.D. 2486 A.S.T.M. D1655 Jet B Type 3-GP-22 MIL-T-5624 JP-4 Grade I.A.T.A. Wide Cut RB211-524G/H-T series engines are prohibited from the use Of JP-4 and Jet B (wide cut) fuel |
| High Flash Point (AVCAT:JP-5) | D.Eng. R.D. 2498 3-GP-24 MIL-T-5624 JP-5 Grade 13 |

Optional Additives (Applies to all engines)

The only optional additives that may be used in approved fuel are as follows:

- (1) Anti-static additive - Shell ASA3 in concentrations not exceeding 1.0 parts per million (grams per cubic meter).
- (2) Anti-icing additive - Specification D. Eng. R.D. 2451 (Issue 2) or MIL/1/27686E in concentrations not exceeding 0.15 percent by volume.
- (3) Anti-Corrosion/lubricity additive - HITEC E515 may be used (formerly Santolene C) at a concentration range up to 5 lb. per 35,000 Imperial gallons, which gives a phosphorus content in the order of 0.07 parts per million.
- (4) Anti-microbiological additive - Biobor JF may be used on an intermittent or not-continuous basis at a concentration level not exceeding 270 parts per million (20 ppm Boron). It is permitted to burn off the treated fuel provided the concentration does not exceed 270 ppm, and the fuel is not contaminated by microbial debris.
- (5) Corrosion inhibitor additive:
 - (a) TOLAD 245 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).
 - (b) APOLLO PRI 19 - in concentrations not exceeding 8 lb. per 35,000 Imperial gallons (approximately 23 mg/L).
 - (c) EMERY 9855 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).

Fuel load and usage limitations are contained in the FAA Approved Airplane Flight Manual applicable to each operator.

The following oils are eligible for the engines:

- Pratt & Whitney: Synthetic type conforming to P&WA 521 as revised.
P&WA Turbojet Engine
Service Bulletin No. 238 lists approved brand oils.
- General Electric: G.E. engines use synthetic type oil conforming to G.E. Spec. D50TF1, classes A and B. G.E. Service Bulletin 79-1 lists approved oil brands.
- Rolls Royce: RB211 engines use ESSO Turbo Oil 25 or Aero Shell Turbine Oil 555. Castrol 580 gas turbine oil II and these oils reclaimed to Rolls Royce standards.

NOTE 4. LIFE LIMITED PARTS AND INSPECTION REQUIREMENTS:**Nose Landing Gear:**

The nose landing gear is life-limited to 50,430 landings. This service life may be corrected to flight hours based on service route segments average times and must be approved by the FAA.

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED (cont'd):**Refueling Spoiler:**

Inflight refueling spoiler P/N 65B20238 is limited to 20,000 inflight operations.

Escape System:

Escape system cool gas generator cartridges manufactured by Olin Corporation and stored either in their original (unopened) shipping canisters or in a cool gas generator between +10°F and +90°F for up to 6 years from date of manufacture are considered serviceable. Cartridges stored for more than 6 years must not be put into service. Inservice cartridge life is limited to 3 years.

Escape system cool gas generator cartridges manufactured by Talley Industries (Ref. Boeing Service Bulletin 747-25-2448) have a storage limit of 7 years from the date of manufacture. Cartridges stored for more than 7 years must not be put in service. Inservice cartridge life is limited to 3 years.

Escape system off-wing slide door and latch thruster (six each per airplane) must be replaced after 15 firings. In addition, the housing bore must be replaced if the bore is 0.002 inches more than the maximum drawing tolerance. Thruster cartridges must be replaced before 5 years calendar time after date of manufacture.

Number 3 and 4 Flap Track Fairings:

The following parts on numbers 3 and 4 flap track fairings are life limited when operated with an RB211 engine in the spare engine position.

152-Hour Life Limit

Outboard Vertical Rod - Rod Ends - 69B14163
 Drive Rod Attach Fittings to the Mid-Flap - 65B39035-1
 Box Links - 65B15598, 65B15599, 65B15598-1-3 and 65B15599-1-3-5
 Seal Support Channels - 65B15544 and 65B15666
 Drive Rod Tubes - 65B15929, 65B15929-3 and 65B15929-8
 Outboard Vertical Rod Tubes - 69B13761-2
 Inboard Vertical Rod Tubes - 69B13762-2

300-Hour Life Limit

Inboard Vertical Rod - Rod Ends - 69B14163-1
 Drive Truss Fittings - 65B17002-1 and 65B17003-1

600-Hour Life Limit

Lateral Rod Tubes - 69B13750-5 and 69B13750-6

1200-Hour Life Limit

Outboard Vertical Rod Brackets - 69B13755-2 and 69B13758-1
 Lateral Rod Brackets - 69B13758-2 and 69B13759-2

747-400F Nacelle Strut Spring Beam Assemblies:

The following spring beam assemblies are life limited to 50,000 landings.

| <u>Engine Installation</u> | <u>Engine Position</u> | <u>Part Number</u> |
|----------------------------|------------------------|---------------------|
| GE CF6-80C2 Series | 1 | 311U0050-46 and -48 |
| | 4 | 311U0050-42 and -44 |
| RR RB211-524G/H Series | 1 | 321U0496-11 and -12 |
| | 4 | 65B89727-27 and -28 |
| PW 4000 Series | 1 | 311U0050-46 and -48 |
| | 4 | 311U0050-50 and -52 |

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED (cont'd):Engine Pylon - Required Inspections:

All outboard engine pylons incorporating the strut beams with spherical bearings must be inspected for bearing seizure every 6,000 flight hours on all models except for the 747-400 airplane. The inspection interval shall not exceed 12,500 hours for the 747-400 airplane. Inspection procedures specified in Boeing Maintenance Planning Document D6-13747, or D621U400 for the 747-400 airplane, or equivalent are acceptable.

NOTE 5. The Pratt and Whitney JT9D-3 and JT9D-3A engines and the JT9D-3A, JT9D-7, JT9D-7A, JT9D-7F, JT9D-7Q, JT9D-7Q3, JT9D-7R4G2, and JT9D-7J engines may be intermixed in the combinations and with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Pratt and Whitney JT9D-7H engines may be intermixed with all JT9D-7 engines with appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Pratt and Whitney JT9D-7AH engines may be intermixed will all JT9D-7A engines with appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The General Electric CF6-50C engines may be intermixed with CF6-50E engines with appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Rolls Royce RB211-524B2, RB211-524C2, and RB211-524D4 engines may be intermixed with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Rolls Royce RB211-524D4X and R8211-524D4X-B engines may be intermixed with RB211-524D4 engines with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Rolls Royce RB211-524D4-B engines may be intermixed with RB211-524D4 engines with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Rolls-Royce RB211-524B2-B engines may be intermixed with RB211-524B2 engines, and RB211-524C2B engines may be intermixed with RB211-524C2 engines with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

The Rolls-Royce RB211-524G2, RB211-524G3, and RB211-524H2 engines may be intermixed in the combinations and with the appropriate limitations noted in the FAA Approved Airplane Flight Manual.

NOTE 6. Blow-in door and fixed lip nacelles may be intermixed in the combinations and the appropriate limitations noted in the FAA Approved Airplane Flight Manual and in the appropriate Appendix of the Airplane Flight Manual.

NOTE 7. The 747-100B series airplanes are basically 747SR series airplanes.

NOTE 8. There are service bulletins which call for modifications which do not comply with the Type Certification Basis. These service bulletins are listed in Boeing Document D6-30300 titled "Service Bulletin 747". The records of airplanes imported into the USA should be reviewed to be sure that further modifications are accomplished to ensure compliance, if the non FAA-approved service bulletins modifications have been installed.

NOTE 9. On certain 747-300 and 747-400 airplanes, the Upper deck exits are rated as a Type "I" due only to the interior arrangement. Requirements for the rerating of the exit are located in FAA Letter ANM-120S:RSY, dated August 1, 1989. The passenger capacity of these airplanes is the same as for the 747-200B (550 total passengers with up to 45 on the upper deck.)

Also on certain 747-400 airplanes, Door No. 3 is rated as a Type "I" due only to the interior arrangement. Requirements for the rerating of the exit are located in FAA Letter ANM-120S:JG dated December 21, 1988. The passenger capacity is limited to 485 total with up to 45 on the upper deck when the upper deck is also rated as Type "I". With the upper deck rated as a Type "A" the passenger capacity is 595 total (485 main deck plus 110 on the upper deck).

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED (cont'd):

NOTE 10. Airplanes line number 679, 685, 696, 700, 705, 708, 710, and on were manufactured after August 20, 1988, and Airplane line numbers 804 and subsequent were manufactured after August 20, 1990, (Reference FAR 121.312(a)(1) Amendment 121-198). Airplane line numbers 805 through 814 are exempt (Exemption No. 5176A). See Boeing Document D6-30300 titled "Service Bulletin 747" for cross reference of line number to serial number to block number.

NOTE 11. Message Category Definitions

1. **Warning:** Defined as an operational or aircraft system condition which may require immediate corrective or compensatory action by the crew.
2. **Cautions:** An operational or aircraft system condition which requires immediate crew awareness and prompt compensatory action.
3. **Advisories:** An operational or aircraft system condition which requires crew awareness for possible future compensatory action.
4. **Memo:** Crew reminders of the current state of selected normal conditions.
5. **Status:** Indications of airplane's condition for dispatch.
6. **FMC Alerts:** Associated with advisories - FMC related operational conditions which require crew awareness for possible future compensatory action.
7. **CMC Messages:** Detailed (maintenance level) messages related to airplane faults.

NOTE 12. MESSAGE, OPERATION, ACTION AND RESPONSIBILITY:

| Message | Responsibility | Phase of Operation | How Quickly is: | |
|----------------|---------------------------|-------------------------------|----------------------------------|----------------------------------|
| | | | Awareness Req'd | Action Req'd |
| WARNING | PILOTS | ALL | IMMEDIATE | IMMEDIATE |
| CAUTIONS | PILOTS | ALL | IMMEDIATE | PROMPT |
| ADVISORIES | PILOTS | ALL | TIMELY | TIMELY* |
| STATUS | GROUND CREW AND PILOTS | DISPATCH | DISPATCH | BEFORE DISPATCH, DEPENDS ON MMEL |
| FMC ALERTS | PILOTS | ALL WHEN USING FMCs | TIMELY | TIMELY (if required) |
| FMC ADVISORIES | PILOTS | ALL WHEN USING FMCs | TIMELY | TIMELY (if required) |
| CMC | GROUND CREW & MAINTENANCE | DISPATCH PREPARATION & CHECKS | WHEN REQ'D BY CMR OR MAINTENANCE | CMR OR SCHEDULE A MAINTENANCE |

*Depends on other failures, phase of flight or context of operation of airplane.

NOTE 13. The Boeing 747 Supplemental Structural Inspection Document D6-35022 (See AD 84-21-02, Amendment 39-4936) will be revised to include the 747-300 and 747-400/-400D/-400F at a time to be determined by FAA engineering.

NOTE 14. The class E cargo compartment on the 747-400F is required to be fitted with a full fire resistant liner which meets the requirement of Part 25 Appendix F, Part III at Amendment 25-60. This requirement is documented in Issue Paper SE-1, Stage 4, dated October 14, 1993, titled Protection of Critical Systems and Equipment within Class E Cargo Compartments.

NOTES APPLY TO ALL MODELS UNLESS OTHERWISE SPECIFIED (cont'd):

NOTE 15. Boeing production line numbers 1047 and on have incorporated the 747 strut modification program in the production sequence. The certification basis for the strut-to-wing attachment structure complies with the following FAR's at the upgraded amendment levels listed below:

| FAR(s) | Subject | Amendment Level |
|------------------------|--------------------------|-----------------|
| 25.301, 25.303, 25.307 | General Structure | 78 |
| 25.305 | Strength and Deformation | 54 |
| 25.321 through 25.563 | Load Conditions | 78 |
| 25.571 | Damage Tolerance | 45 |
| 25.581 through 25.625 | Design and Construction | 78 |
| 25.629 | Aerodynamic Stability | 78 |

Boeing Production Line Numbers 1 through 1046 have incorporated the 747 strut modification program by means of Airworthiness Directive (AD) compliance. The certification basis of this modification is as listed above. The AD's are as follows: 95-13-07 (CF6-45/-50 & JT9D-70; AD 95-13-06 (PW4000 & CF6-80C2); AD 95-13-05 (RB211); and AD 95-10-16 (JT9D-3, -7)

...-END...-