

## *Type Certificate Data Sheet*

### No. 40

This data sheet, which is part of Type Certificate No. 40, prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Japan Civil Aeronautics Law and Regulations.

Type Certificate Holder: The Boeing Company  
737 Logan Ave N  
Renton, WA 98057-0000, U.S.A.

#### **1. Model 747-400 (Transport Category) Airplane, Approved October 29, 1998**

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

#### Engines

4 General Electric Turbofan Model: CF6-80C2B1F  
(Engine Type Approval No.578)

#### Engine Thrust Limits

See DATA PERTINENT TO ALL MODEL 747-400's

#### Fuel

See Note 4.

#### Airspeed Limits

VMO/MMO = 365KCAS/0.92M  
For other airspeed limits, see the appropriate JCAB approved Airplane Flight Manual.

#### CG Range

See the appropriate JCAB approved Airplane Flight Manual.

#### Maximum Weights

See the appropriate JCAB approved Airplane Flight Manual.

#### Maximum Baggage/Cargo

See the appropriate Weight and Balance Control and Loading Manual.

|          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
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Fuel/Oil Capacity

See the appropriate Weight and Balance Control and Loading Manual.

ModelEligible Serial Numbers

|         |                                                                                                                                                                                          |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 747-446 | 24423-24427, 24777, 24784, 24870, 24885, 24886, 25064, 25212, 25260, 25308, 26341-26344, 26346, 26350, 26353, 26355, 26356, 26359-26362, 27099, 27100, 27645, 27646, 27648, 27650, 29899 |
| 747-481 | 24801, 24833, 24920, 25135, 25207, 25641, 25645, 28282, 28283, 29262, 29263, 30322                                                                                                       |
| 747-47C | 24730, 24731                                                                                                                                                                             |

Engine Operating Limits

See the JCAB approved Airplane Flight Manual referenced under this section of this data sheet or the appropriate engine type certification data sheet.

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 flight, 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

See the appropriate JCAB approved Airplane Flight Manual.

For 747-400 airplane the total passengers capacity is limited to:

Maximum 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 10.

Required Equipment

The basic required equipment as prescribed in the applicable Japan Civil Aeronautics Law and 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.

Leveling Means

A plumb-bob attachment and leveling provision scale are provided in the right hand 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                                |
| 251U5001 | 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

All Boeing Service Bulletin will be FAA-approved and will carry a statement to that effect. This statement may be interpreted as "JCAB-approved". All Service Bulletins that are subject to an Airworthiness Directive of the FAA will carry a statement to that effect.

Boeing Report D6-34U102, "Structural Repair Manual", is FAA-approved and will carry a statement to that effect. This statement may be interpreted as constituting JCAB approval.

### Certification Basis

#### Civil Aeronautics Regulations Annex 1

Part III of the TAIKUSEI-SHINSA-YORYO (JCAB Airworthiness Standards) dated September 11, 1989 (transfer from Part 25 of the Federal Aviation Regulations Amendment 25-1 through 25-59), except for following FAR which remains at following amendment level.

| <u>FAR Sec. 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                   |
| 25.773(b)(2)(ii)    | Pilot compartment View                                       | 72                   |
| 25.783              | Doors                                                        | 53                   |
| 25.785              | Seals, berths, safety belts, harnesses                       | 50                   |
| 25.787              | Stowage Compartments                                         | 31                   |
| 25.789              | Retention of items of mass in passenger and crew compartment | 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)**               |
| 25.1401             | Anticollision light system                                   | 26                   |
| 25.1438             | Pressurization and pneumatic systems                         | 40**                 |
| 25.1529             | Instructions for continued airworthiness                     | (NA)**               |

\*\*Not Applicable- The requirements of this section do not apply to this type design.

The following special conditions, exemptions and equivalent safety findings are 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.
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 crew members 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 FAR 25.471(b) to allow lateral displacement of the C.G. from the airplane centerline.

The following optional requirements are part of the certification basis for the Model 747-400.

Ditching Provisions FAR 25.801

Ice Protection Provisions FAR 25.1419

Equivalent safety findings:

Width of Aisle FAR 25.815

Pilot Compartment View FAR 25.773

Use of 1-g Stall Speed (nonstructural items) FAR 25.(Several Sections)

Use of 1-g Stall Speed (structural items) FAR 25.(Several Sections)

Position Light Distribution and Intensities FAR 25.1389(b)(3)

JCAB Special Requirement for Model 747-400 Airplane regarding "Sudden Release of Pressure" :

Any structure, component or part, internal or external to the aft pressure bulkhead, the failure of which could interfere with continued safe flight and landing, must be designed to withstand the effects of a sudden release of pressure through an opening of 20 square feet at any location in the aft pressure bulkhead at any operating altitude. The differential pressure loads must be combined in a rational and conservative manner with 1-g level flight loads and any loads arising from the emergency depressurization conditions. These may be considered as ultimate conditions, however any deformations associated with these conditions must not interfere with continued safe flight and landing.

Civil Aeronautics Regulations Annex 2 Chapter 2 (equivalent to ICAO Annex 16 Volume 1 Chapter 3) for Noise Requirements.

Civil Aeronautics Regulations Annex 3 (equivalent to ICAO Annex 16 Volume 2) for Fuel Venting and Exhaust Emissions Requirements.

Certification Maintenance Requirements (CMR's)

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

Equipment

The basic required equipment as prescribed in the applicable Japan Civil Aeronautics Law and Regulations (See Certification Basis) must be installed in the aircraft.

**2. Model 747-400D (Transport Category) Airplane, Approved October 29, 1998**

The 747-400D is basically the 747-400 airplane with strengthened wings and without the 6-foot wing tip extension and 6-foot winglet. It has provisions for a "one-time" conversion from the Domestic configuration to the International configuration by adding the 747-400 wing extension and winglet.

Engines

4 General Electric Turbofan Model: CF6-80C2B1F  
(Engine Type Approval No.578)

Engine Thrust Limits

See DATA PERTINENT TO ALL MODEL 747-400's

Fuel

See Note 4.

Airspeed Limits

VMO/MMO = 365KCAS/0.92M  
For other airspeed limits, see the appropriate JCAB approved Airplane Flight Manual.

CG Range

See the appropriate JCAB approved Airplane Flight Manual.

Maximum Weights

See the appropriate JCAB 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.

ModelEligible Serial Numbers

|          |                                                                     |
|----------|---------------------------------------------------------------------|
| 747-446D | 25213, 25214, 26345, 26347-26349, 26351, 26352                      |
| 747-481D | 25292, 25639, 25640, 25642-25644, 25646, 25647, 27163, 27436, 27442 |

Engine Operating Limits

See the JCAB approved Airplane Flight Manual referenced under this section of this data sheet or the appropriate engine type certification data sheet.

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 flight, 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

See the appropriate JCAB approved Airplane Flight Manual.

For 747-400Dairplane the total passengers capacity is limited to:

Maximum 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 Japan Civil Aeronautics Law and 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 productions 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.

#### Leveling Means

A plumb-bob attachment and leveling provision scale are provided in the right hand 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                                |
| 251U5001 | 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

All Boeing Service Bulletin will be FAA-approved and will carry a statement to that effect. This statement may be interpreted as "JCAB-approved". All Service Bulletins that are subject to an Airworthiness Directive of the FAA will carry a statement to that effect.

Boeing Report D6-34U102, "Structural Repair Manual", is FAA-approved and will carry a statement to that effect. This statement may be interpreted as constituting JCAB approval.

Certification Basis

## Civil Aeronautics Regulations Annex 1

Part III of the TAIKUSEI-SHINSA-YORYO (JCAB Airworthiness Standards) dated September 11, 1989. (transfer from Part 25 of the Federal Aviation Regulations Amendment 25-1 through 25-59).

Part 25 of the Federal Aviation Regulations:  
Amendment 25-60 through 25-70, with the following exceptions:

| <u>FAR Sec. 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                   |
| 25.561              | 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                                   | 22**                 |
| 25.657              | Hinges                                               | 22                   |
| 25.675              | Stops                                                | 37                   |
| 25.683              | Operation tests                                      | 22                   |
| 25.772              | Pilot compartment doors                              | 46                   |
| 25.783              | Doors                                                | 53                   |
| 25.785              | Seals, 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                 | 40**                 |
| 25.1529             | Instructions for continued airworthiness             | 20**                 |

\*\*Not Applicable- The requirements of this section do not apply to this type design.

The following special conditions, exemptions and equivalent safety findings are 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 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 crew members 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 FAR 25.471(b) to allow lateral displacement of the C.G. from the airplane centerline.

The following optional requirements are part of the certification basis for the Model 747-400D.

Ditching Provisions FAR 25.801

Ice Protection Provisions FAR 25.1419

Equivalent safety findings:

Width of Aisle FAR 25.815

Pilot Compartment View FAR 25.773

Use of 1-g Stall Speed (nonstructural items) FAR 25.(Several Sections)

Use of 1-g Stall Speed (structural items) FAR 25.(Several Sections)

Position Light Distribution and Intensities FAR 25.1389(b)(3)

JCAB Special Requirement for Model 747-400D Airplane regarding "Sudden Release of Pressure" :

Any structure, component or part, internal or external to the aft pressure bulkhead, the failure of which could interfere with continued safe flight and landing, must be designed to withstand the effects of a sudden release of pressure through an opening of 20 square feet at any location in the aft pressure bulkhead at any operating altitude. The differential pressure loads must be combined in a rational and conservative manner with 1-g level flight loads and any loads arising from the emergency depressurization conditions. These may be considered as ultimate conditions, however any deformations associated with these conditions must not interfere with continued safe flight and landing.

Civil Aeronautics Regulations Annex 2 Chapter 2 (equivalent to ICAO Annex 16 Volume 1 Chapter 3) for Noise Requirements.

Civil Aeronautics Regulations Annex 3 (equivalent to ICAO Annex 16 Volume 2) for Fuel Venting and Exhaust Emissions Requirements.

Certification Maintenance Requirements (CMR's)

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

Equipment

The basic required equipment as prescribed in the applicable Japan Civil Aeronautics Law and Regulations (See Certification Basis) must be installed in the aircraft.

### **3. Model 747-400F (Transport Category) Airplane, Approved October 5, 2004**

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

#### Engines

4 General Electric Turbofan Model: CF6-80C2B1F  
(Engine Type Approval No.578)

#### Engine Thrust Limits

See DATA PERTINENT TO ALL MODEL 747-400's

#### Fuel

See Note 4.

#### Airspeed Limits

VMO/MMO = 365KCAS/0.92M

For other airspeed limits, see the appropriate JCAB approved Airplane Flight Manual.

#### CG Range

See the appropriate JCAB approved Airplane Flight Manual.

#### Maximum Weights

See the appropriate JCAB 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.

#### Weight and Balance Manual: D43U542

JCAB Approved Airplane Flight Manual: D6U10002

| <u>Model</u> | <u>Eligible Serial Numbers</u> |
|--------------|--------------------------------|
| 747-446F     | 33748, 33749                   |
| 747-481F     | 34016-34018, 34283             |
| 747-4KZF     | 36132-36135, 36784, 36785      |

#### Engine Operating Limits

See the JCAB approved Airplane Flight Manual referenced under this section of this data sheet or the appropriate engine type certification data sheet.

#### 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 flight, 2 persons (pilot, copilot).

#### Maximum Persons

See the appropriate JCAB approved Airplane Flight Manual.

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 Japan Civil Aeronautics Law and 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.

Leveling Means

A plumb-bob attachment and leveling provision scale are provided in the right hand 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

All Boeing Service Bulletin will be FAA-approved and will carry a statement to that effect. This statement may be interpreted as "JCAB-approved". All Service Bulletins that are subject to an Airworthiness Directive of the FAA will carry a statement to that effect.

Boeing Report D6-34U102, "Structural Repair Manual", is FAA-approved and will carry a statement to that effect. This statement may be interpreted as constituting JCAB approval.

Certification Basis

Civil Aeronautics Regulations Annex 1

Part III of the TAIKUSEI-SHINSA-YORYO (JCAB Airworthiness Standards) dated September 11, 1989. (equivalent to Part 25 of the Federal Aviation Regulations Amendment 25-1 through 25-59).

Part 25 of the Federal Aviation Regulations:  
 Amendment 25-60 through 25-67, with the following exceptions:  
 (See Note 15 for cargo compartment liner requirements)

| <u>FAR Sec. 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 compartment loads                        | 53                   |
| 25.562              | Emergency landing dynamic conditions                 | (NA)**               |
| 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                   |

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|                  |                                             |        |
|------------------|---------------------------------------------|--------|
| 25.683           | Operation tests                             | 22     |
| 25.772           | Pilot compartment doors                     | 46     |
| 25.773(b)(2)(ii) | Pilot compartment View                      | 72     |
| 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.

Based on 14 CFR § 21.101(g) for changes to TC's, applicable provisions of 14 CFR part 26 are included in the certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

Compliance has been found for the following regulations at Amendment 26-0: §26.11

Compliance has been found for the following regulations at Amendment 26-1: §26.49

Compliance has been found for the following regulations at Amendment 26-4: §26.43, §26.45

Compliance has been found for the following regulations at Amendment 26-6: §26.21

The following special conditions, exemptions and equivalent safety findings are 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. 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.
3. Special Condition No. 25-ANM-24 applicable to flight deck displays and propulsion control system was provided to Boeing on December 22, 1988.
4. Special Condition No. 25-ANM-25 which established lightning and radio frequency (RF) energy protection requirements was provided to Boeing on December 22, 1988
5. Special Condition No. 25-285-SC Flammability Reduction Means (Fuel Tank Inerting).

#### Exemptions from FAR Part 25:

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).

No. 10924 dated February 4, 2014, time-limitedly exempts Fuel ignition prevention associated with the FQIS from meeting 25.901(c) and 25.981(a)(3) (Expiration date February 4, 2107)

No. 9735, dated July 31, 2008, exempts The removal of the escape slide installed on the right hand crew service door from meeting 25.809(f)(1).

No. 9791 from 14 CFR §25.853(a), appendix F, paragraph (a)(1)(i), exempted testing on Large Interior Panels, November 28, 2008 granted through November 28, 2010. No. 9791A, January 23, 2009, granted through November 28, 2010. No. 9791B, March 1, 2010, granted through February 28, 2011. No. 9791C, February 4, 2011, granted through November 28, 2011. (Partial Time-Limited Exemption)

The following optional requirements are part of the certification basis for the Model 747-400F.

Ditching Provisions FAR 25.801

Ice Protection Provisions FAR 25.1419

#### Equivalent safety findings:

Width of Aisle

FAR 25.815

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|                                              |                           |
|----------------------------------------------|---------------------------|
| Use of 1-g Stall Speed (nonstructural items) | FAR 25 (Several Sections) |
| Use of 1-g Stall Speed (structural items)    | FAR 25 (Several Sections) |
| Position Light Distribution and Intensities  | FAR 25.1389(b)(3)         |
| Emergency Locator Transmitter (ELT)          | FAR 25.1415(d)            |
| Emergency Exit Marking                       | FAR 25.811(f)             |
| Doors                                        | FAR 25.783(e)             |

The following regulations have been complied with by findings of an Equivalent Level of Safety:

PS06-0496-F-18 §25.1555(d)(1) ELOS Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.

Equivalent Safety Findings: PS08-0670-C-1 §25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

Part 25 of the FAR, effective February 1, 1965, as amended by Amendment 25-1 through 25-59 with the following exceptions: (See Note 16).

JCAB Special Requirement for Model 747-400F Airplane regarding “Sudden Release of Pressure” :

Any structure, component or part, internal or external to the aft pressure bulkhead, the failure of which could interfere with continued safe flight and landing, must be designed to withstand the effects of a sudden release of pressure through an opening of 20 square feet at any location in the aft pressure bulkhead at any operating altitude. The differential pressure loads must be combined in a rational and conservative manner with 1-g level flight loads and any loads arising from the emergency depressurization conditions. These may be considered as ultimate conditions, however any deformations associated with these conditions must not interfere with continued safe flight and landing.

Civil Aeronautics Regulations Annex 2 Chapter 2 (equivalent to ICAO Annex 16 Volume 1 Chapter 3) for Noise Requirements.

Civil Aeronautics Regulations Annex 3 (equivalent to ICAO Annex 16 Volume 2) for Fuel Venting and Exhaust Emissions Requirements.

#### Certification Maintenance Requirements (CMR's)

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

Production Basis      Production Certificate No.700 has been issue to The Boeing Company.

#### Equipment

The basic required equipment as prescribed in the applicable Japan Civil Aeronautics Law and Regulations (See Certification Basis) must be installed in the aircraft.

#### DATA PERTINENT TO ALL MODEL 747-400

|                                       |             |
|---------------------------------------|-------------|
| Engine Model                          | CF6-80C2B1F |
| Thrust Limits:                        |             |
| Takeoff, sea level, std day(5minutes) | 57,160 lbs. |
| Maximum continuous                    | 49,800 lbs. |

THE FOLLWING INFORMATION AND NOTES APPLY TO ALL MODELS TO PLIOR MODEL 747-8F UNLESS OTHERWISE NOTED:

Exemptions to 14 CFR part 25:

1. Exemption from 14 CFR 25.1301(a), 25.1303(b), and 21.601 (formerly 37.120(a)) - To permit the type certification of Boeing Model 747 aircraft 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 foreign air carriers only. (2) Boeing must provide a list of all operators and aircraft operated under this exemption to be maintained in the public docket for this exemption. Boeing must update the list whenever a change is made. (Exemption No. 3035, September 9, 1980, No. 3035A, September 7, 1983, No. 3035B, August 6, 1986, No. 3035C, January 23, 1987, No. 3035D, June 2, 1987, No. 3035E, September 4, 1987, No. 3035F, April 19, 1988.)
2. Exemption from 14 CFR 25.471(b) - Allowance for lateral displacement of the C.G. from the airplane centerline (Exemption No. 1013A dated December 24, 1969)
3. Partial Time-Limited Exemption 9791 from 14 CFR §25.853(a), appendix F, paragraph (a)(1)(i), Testing on Large Interior Panels, November 28, 2010 granted through November 28, 2011. Exemption No. 9791A, January 23, 2009, granted through November 28, 2010, Exemption No. 9791B, March 1, 2010, granted through February 28, 2011. Exemption No. 9791C, February 4, 2011, granted through November 28, 2011.

Equivalent Safety Findings: PS08-670-C-1 §25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

NOTES APPLY TO ALL MODELS PRIOR TO MODEL 747-8F UNLESS OTHERWISE SPECIFIED

- Note 1                    A current Weight & 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. This is in accordance with 14 CFR 25.23, 25.25, 25.27, 25.29, and 25.31.
- Note 2                    Airplane operation must be in accordance with the JCAB approved Airplane Flight Manual. All placards required by either the JCAB approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane. This is in accordance with 14 CFR 25.1541 thru 25.1563.
- Note 3                    The JCAB approved Airworthiness Limitations and Certification Maintenance Requirements are referenced in the following Boeing documents:  
                                     747-400:                    D621U400 (Section 9)  
                                     The Airworthiness Limitations section is JCAB-approved and specifies maintenance required under the Civil Aeronautics Regulations, unless an alternative program has been JCAB approved.
- Note 4                    G.E. engines use fuels conforming to G.E. Spec. D50TF2. MIL-T-5624, Grades JP-4 or JP-5, and ASTM DI655, 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.
- 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-I-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 JCAB approved Airplane Flight Manual.

The following oils are eligible for the engines:

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.

#### Note 5

#### 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.

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.

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 |

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 6

None

#### Note 7

Blow-in door and fixed lip nacelles may be intermixed in the combinations and the appropriate limitations noted in the JCAB approved Airplane Flight Manual and in the appropriate Appendix of the Airplane Flight Manual.

#### Note 8

None

#### Note 9

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 Japan should be reviewed to be sure that further modifications are accomplished to ensure compliance, if the non JCAB-approved service bulletins modifications have been installed.

#### Note 10-11

None

Note 12Message 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 13Message, 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 & 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 14

The Boeing 747 Supplemental Structural Inspection Document D6-35022 (See AD 84-21-02, Amendment 39-4936) is applicable.

Note 15

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.

Note 16

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 95-13-06) compliance. The certification basis of this modification is as listed above.

Note 17-18

None

Note 19

For Model 747-400, -400D, and -400F airplanes: Mandatory replacement times, inspection intervals, related inspection procedures and all critical design configuration control limitation for the fuel tank system determined during the Special Federal Aviation Regulation No. 88 program and for compliance with 14 CFR 25.981 and Special Conditions No. 25.285-SC are listed in the

FAA-approved Airworthiness Limitations and Certification Maintenance Requirement, Section 9, of Boeing 747-400 Maintenance Planning Data Document D621U400-9, Revision August 2005 or later FAA-approved revision. All Model 747-400, -400D, and -400F airplanes, production line number 1377 and on, must comply with Revision March 2006, or a later FAA-approved revision. The FAA is planning to issue an airworthiness directive mandating compliance with Revision March 2006, or a later FAA-approved revision, applicable to all Model 747-400, -400D, and -400F airplanes with production numbers lower than 1377

#### **4. Model 747-8F (Transport Category) Airplane, Approved June 27, 2012**

The 747-8F is based on the model 747-400F aircraft with design changes to the empennage, fuselage, landing gear, wings, engines, fuel systems, and other aircraft systems as defined in the certification basis within this section. The certification basis for areas unaffected by this change from the 747-400F aircraft will remain certified at the 14 CFR Part 25 Amendment level of their original certification date.

##### Engines

4 General Electric Turbofan Model: GENx-2B67, GENx-2B67B, GENx-2B67/P  
(Engine Type Approval No.710-2)

WARNING: To prevent unsafe airplane handling characteristics, electronic engine control (EEC) software C060 (or newer) cannot be intermixed on the same aircraft with older EEC software: C032, C040, or C045. The idle selection logic is different in GE C060 software compared to older versions of EEC software. This difference can potentially provide large unsafe thrust asymmetries during acceleration from lower power if C060 EEC software is mixed with older EEC software (i.e. one or more engine at a high idle, while the rest are at minimum idle. The engines at high idle will respond much quicker if there is a rapid throttle advance). See Boeing Service Bulletin 747-73A2083.

SEE Note 4 Applicable to Model 747-8F regarding intermixing of Engines

##### Fuel

General Electric Turbofan Engines

Fuels conforming to:

ASTM D-1655 grades Jet-A and Jet A-1

MIL-T-5624 grade JP-5

MIL-T-83133 grade JP-8

are acceptable

Fuels produced to other specifications and having properties meeting the requirements of the above specifications are acceptable.

The fuel and any fuel additives must conform to the relevant Engine Operating Instructions.

##### Engine Limits

General Electric Turbofan Engines

See the JCAB approved Airplane Flight Manual for engine ratings

##### Airspeed Limits

VMO/MMO = 365/0.9 (KCAS) See the appropriate JCAB Approved Airplane Flight Manual for other airspeed limits

##### CG Range

See the appropriate JCAB approved Airplane Flight Manual.

##### Empty Weight CG

See the appropriate JCAB approved Airplane Flight Manual.

##### Datum

See Weights and Balance Manual

##### Leveling Means

See JCAB approve Airplane Flight Manual.

Maximum Weights

See the appropriate JCAB approved Airplane Flight Manual.

Minimum Crew

Two (2) persons : pilot and copilot

Number of Seats

Maximum of eight (8) persons including the flight crew per exemption 9793C and limitations outlined in the JCAB approved Airplane Flight Manual

Maximum Compartment Weight

See the appropriate Weight and Balance Control Manual.

Fuel Capacity

See the appropriate Weight and Balance Control Manual.

Oil Capacity

See the appropriate Weight and Balance Control Manual.

Maximum Operating Altitude

42,100

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 Instructions | Lateral Controls            |
| 251U1003 | Rigging Instructions | Speed Brakes                |
| 251U2001 | Rigging Instructions | Elevator Controls           |
| 251U3002 | Rigging Instructions | Rudder Controls             |
| 251U4001 | Rigging Instructions | Stabilizer Trim Controls    |
| 114U0001 | Rigging Instructions | Leading Edge Slats Controls |
| 253U5001 | Rigging Instructions | Control Stand               |
| 263U5001 | Rigging Instructions | Trailing Edge Flap Controls |

Model

747-8KZF

Eligible Serial Numbers

36136 – 36141, 37393, 37394

Certification Basis

Civil Aeronautics Regulations Annex 1

FAR Part 25 including amendment 25-1 through 25-120 (This is equivalent to Part III TAIKUSEI-SHISA-YORYO, KU-KEN-381, dated Oct 20, 1966 including its amendment to KOKU-KU-KI-5011, dated Oct 1, 2007.) and exceptions permitted by 14CFR 21.101. Table A documents the changed/affected areas of the aircraft. Table B documents all regulations for which there are exceptions from Amendment 25-120 for the changed/affected areas. Table C documents unchanged/unaffected areas for which compliance has been shown at an Amendment level higher than the 747-400F Amendment level.

| <b>Section A</b>                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The following section contains a listing of all areas that are changed/affected as part of the 747-8F minor model. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Airplane Area</b>                                                                                               | <b>Changed/Affected Areas</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Airplane Level                                                                                                     | Static Loads; Dynamic Flight Loads; Dynamic Ground Loads; Flutter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                    | Flotation and ditching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                    | Weight and balance; Onboard weight and balance system                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                    | Aerodynamic Stability & Control; Aerodynamic Performance; Aerodynamic Configurations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Airframe – Empennage                                                                                               | All empennage (includes the outboard elevator balance weight towers) except:<br>• Inboard elevator; Remainder of outboard elevator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Airframe – Fuselage                                                                                                | All fuselage (includes all fuselage, floors, doors, and windows) except:<br>•nose cargo door cutout including latches and hinges<br>•upper deck structure from S-0 to S-13, BS 220 to BS 300<br>•crown skin/stringer from S-0 to S-6, BS 300-520<br>•upper deck side of body shear trusses<br>•flight deck floor beams from BS 220-300<br>•structural support for flight deck windshields<br>•all upper deck seat tracks, floor panels, decompression trusses, and side of body shear panels from BS 520-700<br>•BS 2360 aft pressure dome and APU tail cone<br>•Nose radome and nose landing gear doors<br>•Nose cargo door, main entry door, crew door (and integrated window)<br>•flight deck overhead exit door, and forward and center electrical equipment access doors. |
| Avionics                                                                                                           | Pitot static line plumbing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                    | Integrated Display System (IDS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                    | Modularized Avionics and Warning Electronics Assembly (MAWEA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                    | Flight Management Computer (FMC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Communication Management Unit (CMU)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                    | Enhanced Ground Proximity Warning System (EGPWS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Central Maintenance Computer System (CMCS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                    | Airplane Condition and Monitoring System (Data Management Unit (DMU) and Quick Access Recorder (QAR))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                    | Low Range Radio Altimeter (LRRA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Multi-Mode Receiver (MMR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                    | Distance Measuring Equipment (DME)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                    | Automatic Direction Finder (ADF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | VHF Omnidirectional Range/Marker Beacon (VOR/MB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Air Data Inertial Reference System (ADIRS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                    | SATCOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                    | Cockpit Voice Recorder (CVR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                    | Flight Deck (FD) Printer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                    | Flight Data Recorder Systems (FDRS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                    | Onboard Network System (ONS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                    | Terminal Wireless Lan Unit (TWLU)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                    | Emergency Locator Transmitter (ELT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                    | HF/VHF Radio Communication Panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Main Deck Alerting System (MDAS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                    | Traffic Alert and Collision Avoidance System (TCAS) and Air Traffic Control (ATC) Systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                    | Flight Deck Audio System (Audio Management Unit (AMU) and Audio Control Panels (ACP))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Cargo                                                                                                              | Provisions including structural, electrical & drain for Cargo Handling System for Main Deck and Lower Lobe Compartments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                    | Cargo Furnishings, Linings and Placards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| <b>Section A (continued)</b>                                                                                       |                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| The following section contains a listing of all areas that are changed/affected as part of the 747-8F minor model. |                                                                                                             |
| <b>Airplane Area</b>                                                                                               | <b>Changed/Affected Areas</b>                                                                               |
| Electrical Sub-systems                                                                                             | Duct Leak Detection System (DLDS)                                                                           |
|                                                                                                                    | Integrated Wingtip Light Assembly (IWLA)                                                                    |
|                                                                                                                    | Integrated Drive Generator (IDG)                                                                            |
|                                                                                                                    | Main and APU battery                                                                                        |
|                                                                                                                    | Weight and Balance Computer of the On-Board Weight and Balance System                                       |
|                                                                                                                    | Dimmer control unit (DCU)                                                                                   |
|                                                                                                                    | Electrical Power Generation System                                                                          |
|                                                                                                                    | Cargo Powered Outlets                                                                                       |
|                                                                                                                    | Window Heat Control Unit (WHCU) and flight deck window sensors                                              |
|                                                                                                                    | Service and maintenance lights in the wheel wells, AC pack bay, Tailcone/APU compartment and forward EE bay |
| Electrical Wiring and Installation                                                                                 | Fuselage, Wing, Strut, Wheel Well, E/E Cooling, Cargo Handling, FQIS, and Engine Wiring                     |
|                                                                                                                    | Wing Fuel Tank Stringer clip                                                                                |
|                                                                                                                    | Integration panels                                                                                          |
| Environmental Systems                                                                                              | Main Deck and Lower Lobe Cargo Fire Protection System                                                       |
|                                                                                                                    | Forward Cargo Air Conditioning (FCAC) System flow rate and ducting                                          |
|                                                                                                                    | Aft Cargo Air Conditioning (ACAC) System flow rate and ducting                                              |
|                                                                                                                    | APU air supply ducting                                                                                      |
|                                                                                                                    | Air conditioning and trim ducting.                                                                          |
|                                                                                                                    | E6/E9 equipment cooling supply line                                                                         |
|                                                                                                                    | Forward cargo heat ducting                                                                                  |
|                                                                                                                    | Aft/bulk cargo heat ducting                                                                                 |
|                                                                                                                    | Recirculation fans                                                                                          |
|                                                                                                                    | Lower recirculation filters                                                                                 |
|                                                                                                                    | Lav/Galley Vent System (LGVS) ducting                                                                       |
|                                                                                                                    | Cabin Pressure Control System (CPCS)                                                                        |
|                                                                                                                    | Alternate Ventilation System (AVS)                                                                          |
|                                                                                                                    | Engine Anti-Ice Valves                                                                                      |
|                                                                                                                    | Air Supply Control System (ASCS)                                                                            |
|                                                                                                                    | Wing Anti-Ice (WAI) System                                                                                  |
|                                                                                                                    | Hydraulic Air Drive Unit (ADU) air ducting in outboard engine struts                                        |
|                                                                                                                    | Cabin Air Conditioning Temperature Control System (CACTCS)                                                  |
|                                                                                                                    | Forward and aft electrical equipment (EE) cooling systems                                                   |
| Flight Controls                                                                                                    | Fly-by-Wire (FBW) spoiler and outboard aileron control system                                               |
|                                                                                                                    | Inboard and outboard aileron droop                                                                          |
|                                                                                                                    | Flight control mechanical component installations and flight control cables                                 |
|                                                                                                                    | Upper and lower rudder actuator                                                                             |
|                                                                                                                    | Autoflight software                                                                                         |
|                                                                                                                    | Integrated Standby Flight Display (ISFD)                                                                    |
|                                                                                                                    | Rudder ratio changer                                                                                        |
|                                                                                                                    | Elevator feel computer                                                                                      |
|                                                                                                                    | Yaw damper control laws                                                                                     |
|                                                                                                                    | Yaw damper stabilizer trim modules (YSM)                                                                    |
|                                                                                                                    | Pitch Augmentation Control System (PACS)                                                                    |
|                                                                                                                    | Yaw Damper Modal Suppression System (MSS)                                                                   |
|                                                                                                                    | Outboard Aileron Modal Suppression (OAMS)                                                                   |
|                                                                                                                    | Roller brake assembly                                                                                       |
|                                                                                                                    | Lateral Augmented Pitch Function (LAPS)                                                                     |
|                                                                                                                    | Landing Attitude Modifier (LAM)                                                                             |
|                                                                                                                    | Elevator Feel Shift (EFS)                                                                                   |
|                                                                                                                    | Rudder Input Linkages                                                                                       |
|                                                                                                                    | Flight Controls Stabilizer Trim Indication                                                                  |
|                                                                                                                    | High Lift Systems                                                                                           |
| Flight Crew Oxygen System                                                                                          | Fourth 115 cu. ft. crew oxygen cylinder provisions                                                          |

| <b>Section A (continued)</b>                                                                                       |                                                                                                                                                            |
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| The following section contains a listing of all areas that are changed/affected as part of the 747-8F minor model. |                                                                                                                                                            |
| <b>Airplane Area</b>                                                                                               | <b>Changed/Affected Areas</b>                                                                                                                              |
| Flight Deck                                                                                                        | Forward instrument panel (FIP) structure                                                                                                                   |
|                                                                                                                    | Flight deck display interface                                                                                                                              |
|                                                                                                                    | Glareshield                                                                                                                                                |
|                                                                                                                    | Pilot Compartment Viewing                                                                                                                                  |
|                                                                                                                    | Ram Air Turbine (RAT) manual deploy switch                                                                                                                 |
| Flight Deck Crew Accommodations                                                                                    | Emergency equipment stowage, equipment and placarding                                                                                                      |
|                                                                                                                    | Flight manual stowage retention straps                                                                                                                     |
|                                                                                                                    | Flight deck stowage door latches                                                                                                                           |
|                                                                                                                    | Portable oxygen bottle stowage provisions                                                                                                                  |
|                                                                                                                    | PC power outlets for Captain and First Officer                                                                                                             |
|                                                                                                                    | Hand microphones at all 4 crew positions                                                                                                                   |
|                                                                                                                    | Provisions to support EFB installation                                                                                                                     |
|                                                                                                                    | Crew oxygen mask stowage boxes                                                                                                                             |
|                                                                                                                    | Crew oxygen masks                                                                                                                                          |
|                                                                                                                    | Pencil holders                                                                                                                                             |
|                                                                                                                    | Overhead light                                                                                                                                             |
|                                                                                                                    | Carpet periphery                                                                                                                                           |
|                                                                                                                    | Boom microphone jack panels at all 4 crew positions                                                                                                        |
| Interiors                                                                                                          | Thermal acoustic blankets.                                                                                                                                 |
|                                                                                                                    | Fuselage mounted emergency light for inertia reel use at crew door.                                                                                        |
|                                                                                                                    | Customer specific exterior markings including door bands at the crew door.                                                                                 |
| Landing Gear Structures                                                                                            | Nose Landing Gear                                                                                                                                          |
|                                                                                                                    | Body Landing Gear                                                                                                                                          |
|                                                                                                                    | Wing Landing Gear                                                                                                                                          |
| Mechanical and Hydraulic Systems                                                                                   | Landing gear alternate extend cables and brake cables                                                                                                      |
|                                                                                                                    | Wheels, brakes, and tires.                                                                                                                                 |
|                                                                                                                    | Brake system control unit                                                                                                                                  |
|                                                                                                                    | Body and wing gear retract actuators                                                                                                                       |
|                                                                                                                    | Body and wing gear door actuators                                                                                                                          |
|                                                                                                                    | Ram Air Turbine (RAT) and associated equipment and engine driven pumps (EDPs), EDP hoses and EDP check valves                                              |
|                                                                                                                    | Hydraulic system (except RAT and associated equipment and EDPs, EDP hoses, and EDP check valves)                                                           |
|                                                                                                                    | Tire Pressure Indication System and Brake Monitor System                                                                                                   |
|                                                                                                                    | Ground Fault Interrupt                                                                                                                                     |
|                                                                                                                    | Landing Gear Selection System                                                                                                                              |
| Propulsion                                                                                                         | GENx-2B67, GENx-2B67B, GENx-2B67/P engines                                                                                                                 |
|                                                                                                                    | Engine Driven Hydraulic Pumps (EDP)                                                                                                                        |
|                                                                                                                    | Hydraulic tubing, hoses, and component installations on the engine                                                                                         |
|                                                                                                                    | Hydraulic tubing, hoses, and component installations in the aft engine strut                                                                               |
|                                                                                                                    | APU fire extinguishing system extinguisher bottle, safety relief/filler port assembly, discharge head assembly, and discharge outlet/distribution plumbing |
|                                                                                                                    | APU, APU Controls and APU Installation                                                                                                                     |
|                                                                                                                    | Engine Controls                                                                                                                                            |
|                                                                                                                    | Thrust Reverser Systems                                                                                                                                    |
| Propulsion – Electrical Sub-systems                                                                                | APU power feeder                                                                                                                                           |

| <b>Section A (continued)</b>                                                                                       |                                                                           |
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| The following section contains a listing of all areas that are changed/affected as part of the 747-8F minor model. |                                                                           |
| <b>Airplane Area</b>                                                                                               | <b>Changed/Affected Areas</b>                                             |
| Propulsion -Fuels                                                                                                  | Jettison System                                                           |
|                                                                                                                    | Auxiliary Power Unit (APU) Feed System line, pumps and plumbing           |
|                                                                                                                    | Reserve Tank Transfer System                                              |
|                                                                                                                    | Fuel System Scavenge                                                      |
|                                                                                                                    | Fuel tank structure                                                       |
|                                                                                                                    | Fuel Feed System                                                          |
|                                                                                                                    | Fuel Vent System                                                          |
|                                                                                                                    | Fuel Management System                                                    |
|                                                                                                                    | Refuel/Defuel System                                                      |
|                                                                                                                    | Fuel Quantity Indicating System (FQIS) and fuel level sensing             |
|                                                                                                                    | Fuel sump system drain valves                                             |
|                                                                                                                    | Nitrogen Generation System (NGS)                                          |
| Propulsion – Structures                                                                                            | Strut, nacelle, thrust reverser, inlet, exhaust, and systems              |
| Supernumerary Area                                                                                                 | Emergency Evacuation Harnesses                                            |
|                                                                                                                    | Ceilings                                                                  |
|                                                                                                                    | Closet                                                                    |
|                                                                                                                    | Seats                                                                     |
|                                                                                                                    | PSUs and general lighting                                                 |
|                                                                                                                    | Sidewall linings                                                          |
|                                                                                                                    | Partition between closet and RH sidewall                                  |
|                                                                                                                    | Placarding                                                                |
|                                                                                                                    | Floor coverings                                                           |
|                                                                                                                    | Crew bunk mattresses                                                      |
|                                                                                                                    | Crew bunk area smoke penetration seals                                    |
|                                                                                                                    | Ladder Enclosure to Upper Deck Supernumerary Area Smoke Penetration Seals |
|                                                                                                                    | Lavatory                                                                  |
|                                                                                                                    | Galley                                                                    |
|                                                                                                                    | Portable oxygen cylinders and full face masks for main deck cargo access  |
|                                                                                                                    | Placarding in supernumerary area for main deck cargo access               |
|                                                                                                                    | Emergency equipment stowage, equipment and placarding                     |
|                                                                                                                    | Lighted Signs and Overhead emergency exit signs                           |
| Supernumerary Oxygen System                                                                                        | Oxygen boxes                                                              |
|                                                                                                                    | Portable oxygen bottles                                                   |
|                                                                                                                    | Composite Cylinders                                                       |
| Waste/Water                                                                                                        | Potable water pressurization system                                       |
|                                                                                                                    | Potable water tank attachment flanges                                     |
|                                                                                                                    | Potable water distribution lines                                          |
|                                                                                                                    | Vacuum lavatory system                                                    |
|                                                                                                                    | Gray waste water drain system and service panel                           |
| Wing                                                                                                               | Wing pylon structure                                                      |
|                                                                                                                    | All wing structure                                                        |

| Section B                                                                                                                                                                   |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |
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| The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |
| 14CFR §                                                                                                                                                                     | Title                                 | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Comments |
| 25.305                                                                                                                                                                      | Strength and deformation.             | 25-0 for 25.305(b) for Airframe - Empennage (Outboard Elevator Balance Weight Tower)<br>25-0 for 25.305(b) for Systems Stress related to: Landing Gear (Landing gear alternate extend cables and brake cables, Body gear truck positioner mounting features), Hydraulics (Hydraulic reservoirs, hydraulic line, Rudder PCA tubing, LG retract actuators, aileron and spoiler PCUs, Hydraulic Systems 1 and 4 electric pump, PACS actuator and elevator feel shift module hydraulic tubing, Aft strut hydraulic installations), Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection). |          |
| 25.365                                                                                                                                                                      | Pressurized compartment loads.        | 25-0 for 25.365(e), (f), and (g) for Systems Stress related to: Flight Deck (Linings, stowages, and latches, oxygen mask stowage box) and Interiors - Supernumerary Area (Galley and Lavatory)<br>25-54 for 25.365(e)(2) for Airframe – Fuselage and Floors; Section 41 lower lobe, Flight Deck and Empennage (Forward fin box of vertical stabilizer)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |
| 25.395                                                                                                                                                                      | Control system.                       | 25-23 for 25.395(a), (b), and (c) for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |
| 25.397                                                                                                                                                                      | Control system loads.                 | 25-38 for 25.397 for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |
| 25.415                                                                                                                                                                      | Ground gust conditions.               | 25-0 for 25.415 for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| 25.561                                                                                                                                                                      | General.                              | N/A for 25.561(c)(1)(ii) for Airframe – Fuselage/Floor Structures (Section 46 floor beams and frames)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| 25.562                                                                                                                                                                      | Emergency landing dynamic conditions. | N/A for 25.562 for Flight Deck - Flight Deck Seats and Interiors – Supernumerary Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |

| <b>Section B</b><br>The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                      |
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| 14CFR §                                                                                                                                                                                         | Title                                                 | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Comments                                                                                                             |
| 25.571                                                                                                                                                                                          | Damage tolerance and fatigue evaluation of structure. | <p>25-0 for 25.571(a) and (c) for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).</p> <p>25-86 for 25.571(a) and (b) for Systems Stress related to Flight Controls – Lower Rudder Tab Push Rod. (Note: “External loads used in this analysis were evaluated in accordance with 25.571(b) at Amendment 25-120”)</p> <p>25-86 for 25.571(a) and (b) for All Fuselage (includes Floors, Doors, and Windows),, All Wing, All Empennage. (Note: “External loads used in this analysis were evaluated in accordance with 25.571(b) at Amendment 25-120”)</p> <p>N/A for 25.571 for Landing Gear (Main Gear)</p> | Compliance to be shown to CFR25.573(a) and (c) Amdt 25-0 in lieu of CFR25.571 Amdt 120 for Landing Gear (Main Gear). |
| 25.573                                                                                                                                                                                          | Fatigue evaluation of landing gear.                   | 25-0 for 25.573(a) and (c) for Landing Gear (Main Gear)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                      |

**Section B**

The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120.

| 14CFR § | Title                                           | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Comments |
|---------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 25.607  | Fasteners.                                      | <p>25-0 for 25.607 for Airframe – Empennage (Outboard Elevator Balance Weight Tower)</p> <p>25-0 for 25.607 for Flight Controls Elevator and Lateral Control (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever) and High Lift Systems</p> <p>25-0 for 25.607 for Hydraulics (except RAT and hydraulics associated with engine installations)</p> <p>25-0 for 25.607 for Systems Stress related to: Landing Gear (Landing gear alternate extend cables and brake cables, Body gear truck positioner mounting features), Hydraulics (Hydraulic reservoirs, hydraulic line, Rudder PCA tubing, LG retract actuators, aileron and spoiler PCUs, Hydraulic Systems 1 and 4 electric pump, PACS actuator and elevator feel shift module hydraulic tubing, Aft strut hydraulic installations), Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer, Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).</p> |          |
| 25.613  | Material strength properties and design values. | 25-46 for 25.613 for Airframe – Empennage (Outboard Elevator Balance Weight Tower)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| 25.615  | Design properties.                              | 25-23 for 25.615 for Airframe – Empennage (Outboard Elevator Balance Weight Tower)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |

| <b>Section B</b><br>The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |
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| 14CFR §                                                                                                                                                                                         | Title            | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Comments |
| 25.625                                                                                                                                                                                          | Fitting factors. | 25-23 for 25.625(a), (b) and (c) for System Stress related to: Hydraulics (Hydraulic reservoirs, hydraulic line, Rudder PCA tubing, LG retract actuators, aileron and spoiler PCUs, Hydraulic Systems 1 and 4 electric pump , PACS actuator and elevator feel shift module hydraulic tubing, Aft strut hydraulic installations), Landing Gear (Landing gear alternate extend cables and brake cables, Body gear truck positioner mounting features), Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |
| 25.675                                                                                                                                                                                          | Stops.           | <p>25-0 for 25.675(a), (b), and (c) for Flight Controls - Elevator and Lateral Control (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever), Rudder (Rudder cables, Rudder PCMs, Rudder PCAs, Press-to-Center function, Remote compensators, Rudder Anti-cav/relief valves; Primary control linkage aft of aft quadrant, secondary linkage (buss linkage), rudder input linkage) and Stabilizer (Trim arm and control wires)</p> <p>25-0 for 25.675(a) and (b) for Flight Controls High Lift System</p> <p>25-0 for 25.675(c) for System Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).</p> |          |

| <b>Section B</b><br>The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |
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| 14CFR §                                                                                                                                                                                         | Title                   | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Comments |
| 25.677                                                                                                                                                                                          | Trim systems.           | <p>25-23 for 25.677(a), (b), (c), and (d) for Flight Controls Elevator and Lateral Control System (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever)</p> <p>25-23 for 25.677(a), (b), and (c) for Flight Controls Rudder (Rudder cables, Rudder PCMs, Rudder PCAs, Press-to-Center function, Remote compensators, Rudder Anti-cav/relief valves) and Stabilizer (Trim arm and control wires)</p> <p>25-23 for 25.677(b) for Flight Controls Stabilizer trim indicator and greenband on flight deck</p> |          |
| 25.683                                                                                                                                                                                          | Operation tests.        | 25-0 for 25.683 for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                               |          |
| 25.685                                                                                                                                                                                          | Control system details. | 25-0 for 25.685(a), (b), and (c) for Flight Controls Elevator and Lateral Control System (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever)                                                                                                                                                                                                                                                                                                                                                            |          |
| 25.693                                                                                                                                                                                          | Joints.                 | 25-0 for 25.693 for Systems Stress related to: Flight Controls Rudder Control (Cables, mech components installations, upper/lower actuator installation, rudder input linkage), Flight Controls Elevator Control (Cables, mech components installations, Elevator Feel computer. Horizontal stabilizer trim actuator - trim arm switch and control wire) and Flight Controls High Lift (Flap Detents vs Dspeed, LE/TE components, flap drive stroke, flap skew detection).                                                                                                                                                                                                                                                                                                                                                                               |          |
| 25.701                                                                                                                                                                                          | Flap interconnection    | 25-23 for 25.701(a) for Flight Controls High Lift System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| 25.783                                                                                                                                                                                          | Doors.                  | <p>25-88 for 25.783 for Main Deck Side Cargo Door; Forward and Aft Lower Lobe Cargo Doors</p> <p>25-23 for 25.783 for Airframe – Fuselage (Bulk Cargo Door; ECS pack bay access panels)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |

| Section B                                                                                                                                                                   |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |
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| The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                         |
| 14CFR §                                                                                                                                                                     | Title                                                         | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Comments                                                                                                                                                                                                                                                                |
| 25.785                                                                                                                                                                      | Seats, berths, safety belts, and harnesses.                   | 25-64 for 25.785(a), (b), (c), (d), (e) and (i) for Interiors . Supernumerary Area<br>25-64 for 25.785(a) for Flight Deck - Flight Deck Seats                                                                                                                                                                                                                                                                                                                                           | 25.785(a) at amendment 25-64 references 25.562 however, the 747-8F has an exception for 25.562 documenting that 25.562 is not applicable to flight deck and supernumerary seats so reference to 25.562 in 25.785(a) does not imply compliance to 25.562 for those seats |
| 25.795                                                                                                                                                                      | Security considerations                                       | 25-127 for 25.795(b)(2) for Environmental Systems – Air Distribution System                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                         |
| 25.807                                                                                                                                                                      | Emergency exits.                                              | 25-67 for 25.807(b) and (c) for Interiors – Supernumerary Area<br>25-67 for 25.807(a) for Escape Systems (escape slide at crew door)                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                         |
| 25.809                                                                                                                                                                      | Emergency exit arrangement.                                   | 25-114 for 25.809(a) for Escape Systems (Flight Deck Overhead Exit Door; Crew Service Door)<br>25-47 for 25.809(f)(1)(ii), f(1)(iv) and (f)(2) for Escape Systems (Crew Door Escape Slide)<br>25-34 for 25.809(f)(1)(v) for Escape Systems (Crew Door Escape Slide)                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                         |
| 25.811                                                                                                                                                                      | Emergency exit marking.                                       | 25-46 for 25.811(a), (b), (d), (e) and (g) for Interiors – Supernumerary Area and Supernumerary Area<br><u>Emergency Lighting</u>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                         |
| 25.812                                                                                                                                                                      | Emergency lighting.                                           | 25-28 for 25.812 for Interiors – Supernumerary Area and Supernumerary Area<br><u>Emergency Lighting</u>                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                         |
| 25.813                                                                                                                                                                      | Emergency exit access.                                        | 25-46 for 25.813(a), (b), (c) and (d) for Interiors – Supernumerary Area                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                         |
| 25.863                                                                                                                                                                      | Flammable fluid fire protection.                              | 25-0 for 25.863(a) and (b) for Flight Controls Elevator and Lateral Control System (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever) |                                                                                                                                                                                                                                                                         |
| 25.869                                                                                                                                                                      | Fire protection: Systems                                      | N/A for 25.869(a)(1) for Hydraulics Electrical (Hydraulics system fire shutoff valve and flight control shutoff valve; Hydraulic fluid quantity probe in each reservoir)<br><br>25.1359(d) at Amdt 25-32 for 25.869(a)(4) for Hydraulics Electrical (Hydraulics system fire shutoff valve and flight control shutoff valve; Hydraulic fluid quantity probe in each reservoir; Ground Fault Interrupt) and Flight Controls High Lift                                                     | <i>Compliance to be shown to CFR25.1359(d) Amdt 25-32 in lieu of CFR25.869(a)(4) Amdt 120 for Hydraulics Electrical.</i>                                                                                                                                                |
| 25.899                                                                                                                                                                      | Electrical bonding and protection against static electricity. | 25-123                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                         |
| 25.903                                                                                                                                                                      | Engines.                                                      | 25-57 for 25.903(a) and (c) for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                         |

**Section B**

The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120.

| 14CFR § | Title                                               | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Comments |
|---------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 25.981  | Fuel tank ignition prevention.                      | 25-11 for 25.981(a)(3) and (b) for except:<br>25-11 for 25.981 (a)(3) and (b) for APU fuel feed system line, pumps and plumbing, and fuel system scavenge for the following airplane serial numbers (SNs): 36136 - 36138. All other airplane SNs are at 25-120.<br>Regardless of SN, any changes to these systems that affect 25.981 compliance, including APU fuel feed system line, pumps and plumbing, and fuel system scavenge systems, must comply at amendment 25-120.                        |          |
|         |                                                     | 25-125 for 25.981(c) Nitrogen Generation System (NGS)                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |
| 25.1013 | Oil tanks.                                          | 25-57 for 25.1013(a) and (c) for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |
| 25.1093 | Induction system deicing and anti-icing provisions. | 25-57 for 25.1093(b) for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |
| 25.1103 | Induction system ducts.                             | 25-23 for 25.1103(b)(2) for Propulsion - APU                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| 25.1141 | Powerplant controls: General.                       | 25-40 for 25.1141(f)(2) for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| 25.1181 | Designated fire zones: Regions included.            | 25-23 for 25.1181(b) for Propulsion - APU                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |
| 25.1183 | Lines and fittings.                                 | 25-57 for 25.1183 for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |
| 25.1305 | Powerplant instruments.                             | 25-54 for 25.1305(a)(7) for Propulsion – APU                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |
| 25.1309 | Equipment systems and installations.                | 25-0 for 25.1309(a), (b), (c), and (d) for Flight Controls Elevator and Lateral Control System (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever) |          |
| 25.1317 | High-intensity radiated fields (HIRF) protection.   | 25-122                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |
| 25.1323 | Airspeed indicating system.                         | 25-108 for 25.1323(a), (b), and (c) for Flight Controls – Integrated Standby Flight Display<br>25-108 for 25.1323(b), (c), (d), (e), and (f) for Avionics – ADIRS<br>25-108 for 25.1323(b) and (c) for Aerodynamic Configurations                                                                                                                                                                                                                                                                   |          |

| Section B                                                                                                                                                                   |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120. |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |
| 14CFR §                                                                                                                                                                     | Title                                           | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Comments |
| 25.1325                                                                                                                                                                     | Static air vent and pressure altimeter systems. | 25-108 for 25.1325(d) and (e) for Flight Controls – Integrated Standby Flight Display<br>25-108 for 25.1325(a), (b), (c), (d), and (e) for Avionics – ADIRS<br>25-108 for 25.1325(b) and (e) for Aerodynamic Configurations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| 25.1329                                                                                                                                                                     | Flight guidance system.                         | 25-46 for Avionics – Flight Management Computer System<br>25-46 for Flight Controls - Autopilot Flight Director System<br>25-46 for 25.1329(f) for Flight Controls Elevator and Lateral Control System (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever)                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |
| 25.1335                                                                                                                                                                     | Flight director systems..                       | 25-41 for Flight Controls - Autopilot Flight Director System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |
| 25.1353                                                                                                                                                                     | Electrical equipment and installations          | 25-42 for 25.1353(a) for Hydraulics (Hydraulics system fire shutoff valve and flight control shutoff valve)<br>25-42 for 25.1353(a) for Electrical Subsystems - APU<br>25-42 for 25.1353(a) and (b) for Flight Controls High Lift System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |
| 25.1413                                                                                                                                                                     | Safety belts.                                   | 25-51 for Interiors – Supernumerary Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |
| 25.1431                                                                                                                                                                     | Electronic equipment.                           | N/A for 25.1431(d) for Hydraulics (Hydraulic fluid quantity probe in each reservoir)<br>N/A for 25.1431(d) for Electrical Subsystems - APU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |
| 25.1435                                                                                                                                                                     | Hydraulic systems.                              | 25-0 for 25.1435(a) and (b) for Flight Controls Elevator and Lateral Control (Control Wheels, Left and Right Forward Cable Quadrants, Forward Load Limiter Device, Right and Left Cable Systems, Aileron Feel and Centering Unit, Aileron Trim System, Lateral Central Control Actuator, Third Autopilot Servo, Aileron Programmer, Wing Cable System to Inboard Aileron PCU, No-back Brake assembly, Elevator Feel Computer and Autospeedbrake system to drive speedbrake lever), Rudder (Rudder cables, Rudder PCMs, Rudder PCAs, Press-to-Center function, Remote compensators, Rudder Anti-cav/relief valves; Primary control linkage aft of aft quadrant, secondary linkage (buss linkage)) and Stabilizer (Trim arm and control wires)<br><br>25-41 for 25.1435(a)(1), (a)(5), (a)(6), (a)(7), and (b)(2) for Flight Controls High Lift System<br><br>25-41 for 25.1435(a)(1), (a)(2), (a)(4), (a)(5), (a)(6), (a)(7), (a)(8), (b)(1), (b)(2), and (c) for Hydraulics (except RAT and hydraulics associated with engine installations) |          |

**Section B**

The following section contains a listing of all regulations for which changed/affected areas of the aircraft comply with 14 CFR 25 at an Amendment level other than 25-120.

| 14CFR § | Title                                         | Amdt Level For Changed/Affected Areas                                                                                         | Comments |
|---------|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------|
| 25.1439 | Protective breathing equipment.               | 25-38 for Interiors – Supernumerary Area                                                                                      |          |
| 25.1447 | Equipment stands for oxygen dispensing units. | 25-41 for 25.1447(a), (c)(1), (c)(3)(i) and (c)(3)(ii) for Interiors – Supernumerary Area                                     |          |
| 25.1457 | Cockpit voice recorders.                      | 25-124 for 25.1457(a)(6), (d)(1), (d)(4), (d)(5)(i), (d)(5)(ii), (d)(5)(iii), (6)(e)(1) for Avionics - Cockpit Voice Recorder |          |
| 25.1459 | Flight recorders.                             | 25-124 for 25.1459(a)(3), (a)(7) and (a)(8) for Avionics – Flight Data Recorder System                                        |          |
| 25.1522 | APU Limitations.                              | 25-46 for 25.1522 for Propulsion – APU                                                                                        |          |
| 25.1551 | Oil quantity indicator.                       | 25-0 for 25.1551 for Propulsion - APU                                                                                         |          |

**Section C**

The following section contains a listing of all regulations for which unchanged/unaffected areas of the aircraft comply with 14 CFR § 25 at an Amendment level greater than the 747-400F Amendment level.

| 14CFR § | Title                                                 | Amdt Level For Changed/Affected Areas                                                                                                                                                                                                                   | Comments |
|---------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 25.305  | Strength and deformation.                             | 25-120 for 25.305(a), (b) and (c) for Airframe – Fuselage                                                                                                                                                                                               |          |
| 25.365  | Pressurized cabin loads.                              | 25-54 for 25.365(e) for Airframe – Fuselage - Flight deck floor beams/frames (not affected from decompression standpoint)                                                                                                                               |          |
| 25.571  | Damage tolerance and fatigue evaluation of structure. | 25-86 for 25.571(a) and (b) for Airframe – Empennage and Fuselage. (Note: “External loads used in this analysis were evaluated in accordance with 25.571(b) at Amendment 25-120”)<br>25-120 for 25.571(d) and (e) for Airframe – Empennage and Fuselage |          |
| 25.807  | Emergency Exits.                                      | 25-120 for 25.2807(g)(1) for Interiors – Escape Systems Exits                                                                                                                                                                                           |          |

## Exemptions from 14 CFR § 25:

| Applicable Part 25 Section                                                                                                                                                                 | Amndt Level                                                                                                  | Subject                                                                                                                                                         | Exemption Number                    | Date Issued                                          | Expiration Date (if applicable)                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------|-------------------------------------------------------|
| 25.841(a) (2) and (a)(3)                                                                                                                                                                   | 25-87                                                                                                        | Pressurized Cabins . Uncontained Engine Failure                                                                                                                 | 9943<br>9943A                       | 10/29/2009<br>7/12/2011                              | None                                                  |
| 25.901(c)                                                                                                                                                                                  | 25-40                                                                                                        | Installation-No Single Engine Failure Criteria                                                                                                                  | 8518                                | 03/23/2005                                           | None                                                  |
| 25.981(a) (3)                                                                                                                                                                              | 25-102                                                                                                       | Fuel Tank Ignition Prevention-Fuel Tank Structural Fastener Penetrations                                                                                        | 10174                               | 12/14/2010                                           | None                                                  |
| 25.783(g)<br>25.785(d)<br>25.807(a)(1)<br>25.807(g)(1)<br>25.807(i)(1)<br>25.810(a)(1)(i)<br>25.810(a)(1)(iii)<br>25.812(g)(1)(ii)<br>25.813(a)<br>25.813(b)<br>25.857(e)<br>25.1447(c)(1) | 25-23<br>25-64<br>25-67<br>25-114<br>25-114<br>25-114<br>25-114<br>25-28<br>25-46<br>25-46<br>25-93<br>25-41 | Partial Exemption from, Carriage of supernumeraries on an airplane with a class E cargo compartment (with access to the class E compartment) and escape systems | 9793<br>9793A<br>9793B<br>9793C     | 11/26/2008<br>10/02/2009<br>10/22/2010<br>6/16/2011  | None                                                  |
| 25.1305(c)<br>25.1309(c)                                                                                                                                                                   | 25-120                                                                                                       | Fuel System Contamination                                                                                                                                       | 10267<br>10267A<br>10267B<br>10267C | 05/19/2011<br>08/05/2011<br>06/07/2013<br>08/21/2014 | 12/31/2016<br>06/30/2014<br>12/31/2016<br>09/30/2017* |
| 25.1305(c)(5)<br>25.939(a)                                                                                                                                                                 | 25-120<br>25-40                                                                                              | Powerplant Ice-Protection System                                                                                                                                | 11070<br>11070A                     | 09/26/2014<br>02/02/2015                             | 03/31/2016*<br>06/30/2015                             |

Note: \* - Per Exemption 10267C, and Exemption 11070, this applies to Aircraft which the application for airworthiness certificate was made prior to March 31, 2015. For aircraft with an application for airworthiness certificate after March 31, 2015 aircraft must comply with 14 CFR 25.1305(c)(5), 14 CFR 25.1305(c)(6), and 25.1309(c).

The following regulations have been complied with by findings of an Equivalent Level of Safety (ELOS):

| Applicable Part 25 Section         | Amndt Level | Subject                                                                                               | ELOS Number           |
|------------------------------------|-------------|-------------------------------------------------------------------------------------------------------|-----------------------|
| 25.107(e) (1)(iv)                  |             | Minimum Unstick Speed (VMU)                                                                           | TC6918SE-T-F-6        |
| 25.689(a)(1)                       |             | Control Cable Diameter                                                                                | PS05-0212-SF-2        |
| 25.777(e)                          | 46          | Wing Flap Control Lever                                                                               | PS05-0212-SF-1        |
| 25.783(e)                          | 88          | Visual Indication of Forward and Aft Lower Lobe Cargo Door Locked Condition                           | PS05-0212-C-1         |
| 25.783(e)                          | 88          | Visual Indication of Main Deck Side Cargo Door Closed, Latched, and Locked Condition                  | PS05-0212-C-2         |
| 25.811                             |             | Door Sill Reflectance and Exterior Exit Markings                                                      | TC6918SE-T-CS-2       |
| 25.831(g)                          |             | Acceptable High Temperature Physiological Environment During Failure Conditions                       | PS-05-0020-ES-3 Rev.1 |
| 25.857(c)(1)                       |             | Cargo Compartment Classification Inadvertent Smoke Detection in Lower Lobe Class C Cargo Compartments | AT8167-T-ES-1         |
| 25.863<br>25.1182(a)<br>25.1183(a) |             | Engine Nacelle Power Door Opening System (PDOS) Fire Testing                                          | PS05-0211-P-6         |

| Applicable Part 25 Section                          | Amndt Level | Subject                                                                                                                                                                                                                        | ELOS Number                           |
|-----------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 25.863<br>25.1182(a)<br>25.1183(a)                  |             | Nacelle Areas Behind Firewalls for Thrust Reverser Directional Control Valve (DCV)                                                                                                                                             | PS05-212-P-18                         |
| 25.933                                              |             | Flight Critical Thrust Reverser                                                                                                                                                                                                | TC6918-E-T-P-2                        |
| 25.934                                              |             | Engine and Thrust Reverser System Testing                                                                                                                                                                                      | TC6918-E-T-P-17                       |
| 25.981(a)(3)                                        |             | Installation of GFI Relays on Boeing Model 707, 727, 737CL, 737NG, 747CL, 747-400, 757, 767 & 777 Airplanes and Equivalent Safety Finding for Ground Fault Interrupter Circuit Protection for Fuel Override and Jettison Pumps | PS05-0123-P-1 Rev.1<br>PS05-0212-P-24 |
| 25.981(b)                                           | 125         | Fuel Tank Flammability Reduction Rule                                                                                                                                                                                          | PS05-0177-P-2                         |
| 25.997(d)<br>25.1305(c)(6)                          |             | Warning Means for Engine Fuel Filter Contamination                                                                                                                                                                             | PS05-0212-P-4                         |
| 25.1145(a) and (b)                                  |             | Ignition Switches                                                                                                                                                                                                              | PS05-0212-P-5                         |
| 25.1181(a)(6)<br>25.1182(a)                         |             | Fire Safety Requirements for the GEnx-2B Engine Fan Case                                                                                                                                                                       | PS05-0211-P-23                        |
| 25.1182<br>25.1183                                  |             | Fire Safety Requirements for the GEnx-2B Engine Compartment                                                                                                                                                                    | PS05-0211-P-21                        |
| 25.1193                                             |             | Cowling and Nacelle Skin Fireproof Regions                                                                                                                                                                                     | PS05-0211-P-16                        |
| 25.1301(a), and (d)<br>25.1309(a), and (c)          |             | Transition Speed of Enhanced Ground Proximity Warning System (EGPWS) Mode 4 Alerts; Too Low Flaps/Too Low Terrain                                                                                                              | PS05-0212-S-3                         |
| 25.1303(c)(1)                                       |             | Overspeed Aural Warning                                                                                                                                                                                                        | TC6918SE-T-SA-11                      |
| 25.1435(b)(1)                                       | 104         | Request for an Equivalent Level of Safety Finding for the Hydraulic System Pressure Test                                                                                                                                       | PS05-0212-SF-4                        |
| 25.1517                                             |             | Rough Air Speed (VRA)                                                                                                                                                                                                          | TC6918SE-T-F-4                        |
| 25.1529<br>Appendix H                               |             | Maintenance Planning Document Section 9 (Instruction for Continued Airworthiness)                                                                                                                                              | TC6918SE-T-G-8                        |
| 25.1325(e)                                          |             | Standby Air Data System                                                                                                                                                                                                        | PS05-0212-F-3                         |
| 25.161(a), and (c)(3),<br>25.1301(a),<br>25.1309(a) |             | Longitudinal Trim                                                                                                                                                                                                              | PS05-0212-F-4                         |
| 25.1555(d)(1)                                       |             | Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.                                                                                                                                                               | PS06-0496-F-18                        |
| 25.853(a)                                           |             | Adhesives Used in Interior Panel Joint Potting Applications.                                                                                                                                                                   | PS08-0670-C-1                         |

Special Conditions with respect to the following subjects apply to the 747-8F:

| Special Condition Number | Effective Date | Subject                                                                                                                 |
|--------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------|
| 25-385-SC                | 11/09/2009     | Structural Design Requirements for Four-Post Main Landing Gear System                                                   |
| 25-387-SC                | 09/11/2009     | Additional Airframe Structural Design Requirements Related to Sudden Engine Stoppage Due to Fan Blade Failures          |
| 25-388A-SC               | 06/27/2011     | Interaction of Systems and Structures<br>(See Note 5 for Section 4. Model 747-8F )                                      |
| 25-401-SC                | 02/16/2010     | Systems and Data Networks Security – Protection of Airplane Systems and Data Networks From Unauthorized External Access |
| 25-402-SC                | 02/16/2010     | Design Roll Maneuver Requirement                                                                                        |

### Additional Certification Basis Information

Based on 14 CFR §21.101(g) for changes made to TCs applicable provisions of 14 CFR part 26 are included in the certification basis. For any future 14 CFR part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections

Compliance has been found for the following regulations at Amendment 26-0: §26.11  
Compliance has been found for the following regulations at Amendment 26-1: §26.49  
Compliance has been found for the following regulations at Amendment 26-4: §26.43 and §26.45

#### Environmental requirements

Civil Aeronautics Regulations Annex 2 Chapter 2 (equivalent to ICAO Annex 16, Volume 1, Chapter 3) for Noise Requirements.

Civil Aeronautics Regulations Annex 3 (equivalent to ICAO Annex 16, Volume 2) for Fuel Venting Requirements.

#### JCAB additional special requirement:

- (1) Requirements for markings and placards as shown in FAA AC21-2J and JCAB Circular No.1-008 (Japan special requirements)
- (2) Requirement for Airplane Flight Manual written in Japanese language as shown in FAA AC21-2J and JCAB Circular No.1-001 (Japan special requirements)

### Additional Design Requirements and Condition

The following design details or information must be maintained to ensure that an unsafe design condition is not present:

#### 14 CFR 25.1329 - Flight Guidance System

The following design features must be incorporated in the type design (reference § 25.1329, Amendment 25-46). In lieu of the following, compliance to 25.1329, Amendment 25-119, may be shown.

1. Quick autopilot disconnect switches for each pilot on the outboard arm of each control wheel and quick autothrust disconnect switches for each pilot on the underside of the thrust control levers for engines 1 and 4.
2. Positive disconnect function for the autopilot is provided by the disconnect bar located at the glare shield on the autopilot mode control panel (MCP).
3. Positive disconnect function for the autothrottle is provided by the autothrottle arm switch, also located on the MCP.
4. Automatic synchronization of the autopilot and autothrust functions is provided in order to ensure transient free engagement and mode switching.
5. Automatic stabilizer trim is used to offload the elevator in order to ensure no more than a minor transient as a result of disengagement of the autopilot pitch axis.
6. The wheel position provides a visual and tactile indication of any wheel input which may be required at disengagement of the autopilot roll axis.
7. When multiple autopilot channels are engaged, disengagement of an individual autopilot does not result in a transient any greater than a minor transient.
8. The throttle levers remain in the current position when the autothrust function is disengaged.
9. Failures of the automatic stabilizer trim function, and other detected failures which degrade autopilot operation but do not pose an immediate hazard to the airplane, result in activation of the master caution light and aural, as well as the display of an AUTOPILOT caution message.

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10. Detected failures which do pose an immediate hazard to the airplane, result in an autopilot disconnect with associated autopilot disconnect warning level annunciation that includes activation of the master warning light and aural as well as the display of an AUTOPILOT warning message.
  11. Transition from multiple autopilot operation to single autopilot operation (with associated yaw axis autopilot servo disconnect), during engine inoperative go-around, does not require exceptional piloting skill, alertness, or strength.
  12. The AFDS provides low speed protection via the following features:
    - a. The AFDS controls to an angle-of-attack which corresponds to one degree below the stick shaker angle-of-attack.
    - b. The AFDS take-off mode provides windshear recovery guidance which meets the criteria of AC 25-12 and AC 120-41.
    - c. An indication to the flight crew of a low speed condition includes the display of the stick shaker angle-of-attack via a pitch limit indicator (PLI).
    - d. The thrust management function (TMF), when engaged in SPD mode, provides low speed protection when the AFDS vertical speed (V/S) mode is engaged and commanding a climb. In addition, if the angle-of-attack rises above a fixed reference point, the AFDS issues a V/S mode failure by removing the pitch flight director bars if the flight director is turned on.
    - e. If the autopilot is engaged, a V/S mode failure will result in an amber line being drawn through the V/S mode annunciation on the primary flight display (PFD), illumination of the master caution light, activation of the master caution aural, and display of an AUTOPILOT caution message.
    - f. An indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band of the airspeed indicator.
    - g. The AFDS provides low speed protection by controlling to a reference angle-of-attack when in Flight Level Change (FLCH) mode. An additional indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band.
    - h. When the AFDS altitude capture (ALT CAP) mode is engaged, the TMF, if engaged in SPD mode, provides low speed protection. In addition, under certain conditions the AFDS will provide altitude capture speed floor protection by controlling to a speed no lower than 5 knots below the MCP selected speed.
    - i. If the AFDS altitude capture mode is engaged, and the angle-of-attack rises above a fixed reference point the AFDS will issue an ALT CAP mode failure by removing the pitch flight director bars if the flight director is turned on. If the autopilot is engaged, the ALT CAP mode failure will result in a mode annunciation on the Primary Flight Display (PFD), illumination of the master caution light, activation of the master caution aural, and display of an AUTOPILOT caution message. An additional indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band.
    - j. When the AFDS Altitude Hold (ALT HLD) mode is engaged, the TMF, if engaged in SPD mode, provides low speed protection. An additional indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band.
    - k. When the AFDS Vertical Navigation (VNAV) mode is engaged, the TMF, if engaged in SPD mode, provides low speed protection. Otherwise, when engaged in VNAV SPD, the FMF provides low speed protection. An additional indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band.
    - l. When the AFDS glideslope (G/S) mode is engaged, the TMF, if engaged in SPD mode, provides low speed protection. An additional indication to the flight crew of a low speed condition is an AIRSPEED LOW caution message when the airspeed drops below the top of the lower amber band.
    - m. When the AFDS go-around mode is engaged, the AFDS provides low speed protection by controlling to an angle-of-attack which corresponds to one degree below the stick shaker angle-of-attack. The AFDS go-around mode provides windshear recovery guidance and meets the criteria of AC 25-12 and AC 120-41. An additional indication to the flight crew of a low speed condition includes the display of the stick shaker angle-of-attack (via a pitch limit indicator (PLI)).

- n. Autothrottle wake-up requires that the autothrottle arm switch, located on the MCP, be in the ARM position. When the AFDS is not in takeoff, go-around, FLCH, or VNAV SPD modes, the autothrottle will automatically engage into SPD mode and provide speed protection when the airspeed drops approximately 5 to 10 knots below the top of the lower amber band.
13. The AFDS provides high speed protection via the following features:
    - o. Indication to the flight crew of a high speed condition is an OVERSPEED warning message when the airspeed/Mach number exceeds VMO/MMO
    - p. When the AFDS takeoff mode is engaged, the AFDS provides high speed protection by controlling to the flap placard (flaps down) or VMO/MMO (flaps up).
    - q. When the AFDS V/S mode is engaged, the TMF, if engaged in SPD mode, provides high speed protection.
    - r. When the AFDS FLCH mode is engaged, the AFDS provides high speed protection by controlling to the flap placard (flaps down) or VMO/MMO (flaps up).
    - s. When the AFDS ALT CAP mode is engaged, the TMF, if engaged in SPD mode, provides high speed protection.
    - t. When the AFDS ALT HLD mode is engaged, the TMF, if engaged in SPD mode, provides high speed protection.
    - u. When the AFDS VNAV mode is engaged, the TMF, if engaged in SPD mode, provides high speed protection. Otherwise, when engaged in VNAV SPD, the FMF provides high speed protection.
    - v. When the AFDS G/S mode is engaged, the TMF, if engaged in SPD mode, provides high speed protection.
    - w. When the AFDS go-Around mode is engaged, the AFDS provides high speed protection by controlling to the flap placard (flaps down) or VMO/MMO (flaps up).
  14. For the flight guidance system functions, controls, indications, and alerts, means are provided to indicate the current mode of operation as well as any armed modes. Mode transitions are indicated on the Primary Flight Display (PFD) and highlighted with boxes that are displayed around the changed mode for ten seconds following the mode change. The indications are visible to each pilot under all expected lighting conditions during the flight deck lighting evaluation.
  15. Autopilot disengagement is annunciated via illumination of the master warning light, activation of the master warning aural, and via the display of an AUTOPILOT warning message. A dedicated autopilot warning provides for an aural warning which is unique from all of the other aural warnings.
  16. Override of the Autothrust by the flight crew using the throttles does not require excessive force, and does not create a potential hazard to the airplane.

#### 14 CFR 25.365(e)(2) – Section 41 Lower Lobe (BS 140-460)

The following design features must be incorporated in the type design (reference § 25.365, Amendment 25-54). In lieu of incorporating the following design features, compliance to § 25.365, Amendment 25-120, may be shown.

#### Section 41 Lower Lobe (BS 140-460):

When evaluating this compartment for compliance to § 25.365, the compartment must be analyzed using the following two conditions:

- (1) A 3.7 square foot opening (forward EE Bay access door) with the BS 464 cargo liner intact (3.7 sf), and
- (2) A 20.0 square foot opening with the BS 464 cargo liner blown down. This essentially combines the Section 41 Lower Lobe and the forward cargo compartment into one compartment in the analysis.

#### 14 CFR 25.561(c)(1)(ii) – Auxiliary Power Unit Fuel Line in Section 46

The following design features must be incorporated in the type design. In lieu of incorporating the following design features, compliance to § 25.561(c)(1)(ii), Amendment 25-120, may be shown.

- (1) The Section 46 floor beams must be designed to protect the auxiliary power unit (APU) fuel lines from an emergency landing load event of a minimum of 5.2 g's down and 1.5 g's up.
- (2) The APU fuel line must be routed through the main deck floor beams just outboard of BL 0 to minimize potential for all types of penetration (including rotor burst, wheels up landing impact, etc).
- (3) Occupants must be located no less than 72 feet forward of the forward-most potential penetration location in the APU fuel hose.

#### Damage Tolerance and Fatigue Evaluation of Structure

##### 14 CFR 25.571(a) and (b) – Wing, Empennage, Fuselage, Floors and Doors

The following design features must be incorporated in the type design (reference § 25.571(a) and (b), Amendment 25-86). In lieu of incorporating the following design features, compliance to § 25.571(a) and (b), Amendment 25-120, may be shown.

- (1) For the 747-8F structure, an evaluation of the existing damage tolerance analysis (DTA) inspection program identified in the Supplemental Structural Inspection Document (SSID) must be performed for any required changes due to loads, geometry changes, material changes, etc. The resulting inspection requirements for the 747-8F must be included in Section 9 (Airworthiness Limitations) of the Boeing Maintenance Planning Document (MPD) D621U400 in accordance with § 25.571(a)(3) at Amendment 25-120.
- (2) The above evaluation must include loading magnitudes and loading spectra which are developed in accordance with § 25.571 at Amendment 25-120. This includes usage of the 1.15 factor for pressure acting alone in accordance with § 25.571(b)(5) at Amendment 25-120.
- (3) Maintenance instructions must be based on in-service data and fatigue testing to ensure freedom from widespread fatigue damage.

#### 14 CFR 25.809(a) – Outside Viewing means for Flight Deck Overhead Exit

The following design features must be incorporated in the type design (reference § 25.809(a), Amendment 25-47). In lieu of incorporating the following design features, compliance to § 25.809(a), Amendment 25-120, may be shown.

- (1) Large windows installed adjacent to the flight deck overhead exit door that provide a means for outside viewing to determine if there is a hazard (such as a fire) that would pose an immediate threat to the occupants of the airplane if the emergency exit were to be opened.
- (2) 8 inertia reels (with harnesses) installed for egress out flight deck overhead exit door.

#### 14 CFR 25.981(a)(3) and (b) – Fuel Tank Ignition Protection

The amendment level is 25-120 for § 25.981(a)(3), and (b) except:

25-11 for § 25.981 (a)(3) and (b) for APU fuel feed system line, pumps and plumbing, and fuel system scavenge systems only for the following airplane serial numbers(SNs): 36136, 36137, 36138

. All other airplane SNs are at 25-120. Regardless of SN, any changes to these systems that affect 25.981 compliance, including the APU fuel feed system line, pumps and plumbing, and fuel system scavenge systems, must comply at amendment 25-120.

Following fire/smoke detection, the crew will follow the AFM procedure to depressurize the cabin and ascend or descend the airplane to an altitude of 25,000 feet until final descent to suitable airport is possible.

Class E cargo compartment liners will be tested to meet requirements of 14 CFR part 25, appendix F part III (Amdt. 25.83). Except at the following locations:

- (1) The linings above the cargo compartment ceiling in the stairwell to the upper deck;
- (2) Equipment/features mounted in the sidewall liners (and any sidewall liner joints to the equipment) such as the nose door control panel;
- (3) Liner joints at door edge frames (door 1, side cargo door, nose door);
- (4) Soft liner and joints above side cargo door where the hinges penetrate;
- (5) The aluminum and fiberglass dado panels (and associated joints) installed along the cargo compartment sidewalls from the cargo floor to approximately 10" to 15" above the floor.

Air grills in the ceiling panels between station 520 and 620 must be painted with intumescent paint which expand and close off the grill when exposed to a fire.

Protection of wires required for continued safe flight and landing inside the Class E compartment will be accomplished by any one, or combination of the following:

- (1) Routing behind fire resistant liners;
- (2) Routing of redundant wires on opposite sides of the main deck floor and/or opposite sides of the crown area, and/or with a minimum separation of 6';
- (3) Placement of air dams or fire stops behind cargo liners as required to prevent propagation of fire behind the liner;
- (4) Use of fire resistant wire or insulation where required to protect wire in locations subject to potential high temperatures on the backside of cargo liners and above ceiling panels (below the flight deck for example); and
- (5) Placement of special fire resistant covers behind air return grilles/decompression vents as required.

At least one critical oxygen line, which provides oxygen to the flight deck, must be protected by fire resistant sidewall liner material and a protective fiberglass cover on the associated air return grille/decompression vent.

Additional information is listed in Section 9 of Boeing Maintenance Planning Data Document D011U721-02 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 has been issued to The Boeing Company.

#### Equipment

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

#### NOTES APPLICABLE TO SECTION 4 MODEL 747-8F ONLY:

Note 1 A current Weight and Balance Manual including a list of equipment included in the certificated empty weight 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. This is in accordance with 14 CFR 25.23, 25.25, 25.27, 25.29, and 25.31.

Note 2 Airplane operation must be in accordance with the JCAB approved Airplane Flight Manual. All placards required by either the JCAB approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane. This is in accordance with 14 CFR 25.1541 thru 25.1563.

Note 3 The FAA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness are referenced in Maintenance Planning Data Document (MPD) Section 9 - Airworthiness Limitations and Certification Maintenance Requirements; Boeing Document D011U721-02. The Airworthiness Limitations section is FAA-approved and specifies maintenance required under 14 CFR 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved. The following documents are the FAA approved requirements to comply with 14 CFR 25.1529, 43.16 and 91.403:

D011U721-02-01, 747-8/8F Airworthiness Limitations (AWLs)  
 D011U721-02-02, 747-8/8F Airworthiness Limitations (AWLs) - Line No. Specific  
 D011U721-02-03, 747-8/8F Certification Maintenance Requirements (CMRs)  
 D011U721-02-04, 747-8/8F Special Compliance Items (SCIs)/Airworthiness Limitations

Note 4 Engine Intermix of GENx-2B67, GENx-2B67B and GENx-2B67/P engines is allowed in accordance with a method approved by the FAA.

Note 5 Special Condition No. 25-388A-SC requires that the airplane be free of any aeroelastic instability throughout the certified flight envelope for any single structural failure. 747-8F series airplanes production line number (LN) 1420 through 1434, and 1436 through 1491 were delivered with a

one-piece outboard underwing attachment (R3) fitting (part numbers 112U7308-1, 112U7308-2, 112U7308-3, or 112U7308-4) at the outboard engines. Following certification, it was determined that the one-piece fitting was not compliant with the special condition. However, safety of the airplane is assured by the damage tolerance-based inspections of the one-piece fitting, approved as part of the type design.

747-8F airplanes LN 1435 and 1492 and on are delivered with a two-piece R3 fitting at the outboard engines, which is compliant with the special condition. In addition, Boeing Service Bulletin 747-57-2339 provides the retrofit procedures for incorporating the two-piece fitting as part of later showing of compliance to the special condition.

For airplanes that are not equipped with the two-piece fitting during production or per the service bulletin, repairs to the one-piece fitting beyond those approved in the Structural Repair Manual cannot be approved.

THE FOLLOWING INFORMATION AND NOTES APPLY TO ALL MODELS UNLESS OTHERWISE NOTED:

Note J1 This Type Certificate Data Sheet (TCDS) is based on FAA TCDS No. A20WE revision 57 dated February 27, 2015.

Note J2 Dates of application for FAA and JCAB Type Certification for Model 747 Series are as follows.

| Model               | FAA TC No. A20WE                 | JCAB TC No. 40   |
|---------------------|----------------------------------|------------------|
| Model 747-400/-400D | May 17, 1985 / November 15, 1989 | January 26, 1998 |
| Model 747-400F      | September 22, 1989               | May 28, 2004     |
| Model 747-8F        | December 31, 2006                | August 18, 2008  |

Note J3 Import Requirements/Import Eligibility  
To be considered eligible for operation in Japan, each aircraft manufactured under this Type Certificate must be accompanied by a Certificate of Airworthiness for Export or certifying statement endorsed by the exporting foreign civil airworthiness authority which states the following (in the English language)  
“This aircraft has been examined, tested and found to conform to the type design approved under JCAB Type Certificate No. 40-3 and to be in a condition for safe operation.”

..... END .....