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## AIRWORTHINESS DIRECTIVE

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On the effective date specified below, and for the reasons set out in the background section, the CASA delegate whose signature appears below revokes Airworthiness Directive (AD) AD/B747/46 Amdt 6 and issues the following AD under subregulation 39.001(1) of CASR 1998. The AD requires that the action set out in the requirement section (being action that the delegate considers necessary to correct the unsafe condition) be taken in relation to the aircraft or aeronautical product mentioned in the applicability section: (a) in the circumstances mentioned in the requirement section; and (b) in accordance with the instructions set out in the requirement section; and (c) at the time mentioned in the compliance section.

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### Boeing 747 Series Aeroplanes

**AD/B747/46  
Amdt 7**

**Forward Fuselage Pressure Shell**

**8/2007**

Applicability: B747 aircraft, line positions 1 to 685, (aircraft built prior to August 1987) in 6 Groups:

Group	Description
1	747 line numbers 1-87
2	747 line numbers 88-603 (Not including SUD and nose cargo door airplanes)
3	747 line numbers 604-661 (Not including SUD and nose cargo door airplanes)
4	747 line numbers 662-672 (Not including SUD and nose cargo door airplanes)
5	747 line numbers 673-678 (Not including SUD and nose cargo door airplanes)
6	747 line numbers 679-685 (Not including SUD and nose cargo door airplanes)
7	747 SUD and nose cargo door airplanes, line numbers 88-603
8	747 SUD and nose cargo door airplanes, line numbers 604-661
9	747 SUD and nose cargo door airplanes, line numbers 662-672
10	747 SUD and nose cargo door airplanes, line numbers 673-678
11	747 SUD and nose cargo door airplanes, line numbers 679-685

(applicability is as defined by Boeing Service Bulletin 747-53A2265, Revision 9)

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- Requirement: 1. Accomplish an external detailed visual inspection for cracked skin or loose or missing fasteners of the body skin between BS 420 and BS 460 inclusive and between stringers S-8 and S-12 inclusive on the left and right sides of the aircraft and accomplish any necessary corrective actions, in accordance with the technical requirements of Boeing Service Bulletin 747-53A2265 Revision 9.

*Note 1: Requirement 1 is the requirement formerly contained in AD/B747/324, which has now been transferred to this AD. AD/B747/324 has now been cancelled.*

2. Conduct a close detailed visual inspection (refer Boeing S/B 747-53A2265 Revision 7) of the interior structure of the pressure shell, including the junction of the floor beams with the fuselage frames, and in addition, conduct an external detailed visual inspection of the skin at the fuselage frame fasteners, at and within the following areas, left hand and right hand, and at the following times, with the following partial exemptions:

- \* *Group 1 aircraft are exempt from the 7000 flights inspection.*
- \* *Group 4 Right Hand side only, and Groups 5 and 6 aircraft are exempt from all inspections within the area above Stringer (S)-13A, from Body Station (BS) 320 to BS 400.*
- \* *Group 6 aircraft are also exempt from all inspections within the area below S-22, from BS 300 to BS 320.*

2A. Before exceeding 7000 flights, inspect locations:

BS 240,	from S-13A to 14E.
BS 360 to 380,	from S-1 to 3.
BS 360,	from S-3 to 8.
BS 300 to 320,	from S-22 to 26.

2B. Before exceeding 10,000 flights, inspect locations:

BS 200 to 240,	from S-13A to 14E.
BS 240,	from S-6 to 13A.
BS 320 to 340,	from S-5 to 8 (window surround).
BS 330,	from S-11 to 14.
BS 360 to 380,	from S-0 to 4.

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BS 360 to 420,	from S-4 to 10A.
BS 420 to 460,	from S-9 to 10A.
BS 440,	from S-10A to 13A.
BS 380 to 420,	from S-10A to 12A, applicable only to structure under upper deck doors.
BS 240 to 280,	from S-22 to 26.
BS 280 to 400,	from S-22 to 27A.
BS 400 to 480,	from S-13A to 14.
BS 400 to 520,	from S-14 to 30.
BS 500 to 520,	from S-30 to 34.
2C. Before exceeding 13,000 flights, inspect locations:	
BS 200 to 240,	from S-13A to 15.
BS 240,	from S-6 to 11.
BS 240 to 320,	from S-11 to 14.
BS 320 to 340,	from S-11 to 19.
BS 320 to 340,	from S-5 to 8 (window surround).
BS 340 to 400,	from S-0 to 19.
BS 400 to 520,	from S-6 to 30.
BS 400 to 420,	from S-4 to 6.
BS 480 to 520,	from S-30 to 34.
BS 240 to 280,	from S-22 to 26.
BS 280 to 400,	from S-22 to 27A.
BS 400,	from S-30 to 34.
2D. Before exceeding 16,000 flights, inspect locations:	
BS 200 to 240,	from S-0 to 11.

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BS 320 to 520,	from S-0 to 8.
BS 340 to 520,	from S-8 to 11.
BS 200 to 520,	from S-11 to 15.
BS 240 to 520,	from S-15 to 19.
BS 400 to 520,	from S-19 to 22.
BS 240 to 520,	from S-22 to 34.
BS 240,	from S-34L to 34R, underside.
BS 320,	from S-34 to nose gear wheel well.

2E. Before exceeding 19,000 flights, inspect locations:

BS 140 to 520, all pressure shell structure.

Repeat the '2E.' inspection at intervals not to exceed 3000 flights, until 20,000 flights. Then inspect at 20,000 flights or within 2000 flights since last inspected, whichever occurs later. Thereafter inspect at intervals not to exceed 2000 flights.

3. Conduct additional internal and external close visual inspections one frame bay and one stringer each side of any frame crack. If the frame crack exceeds one half of the frame cross section, extend the inspection area to 6 stringer spacings each side of the frame crack.
4. Inspect any fuselage skin lap splices in the vicinity of any frame or floor beam crack longer than 25mm, for 500mm fore and aft of the cracked member. Inspect in accordance with Boeing NDT Manual D6-7170, Part 6 Subject 53-30-00 Figure 2.

*Note 2: FAA AD 2005-08-01 and Boeing SB 747-53A2265 (various revisions as applicable) refer.*

*Note 3: Crew escape hatches, crew doors, and main entry doors are excluded from the inspection requirements of this AD.*

### **New Requirements introduced by previous amendment (Amendment 6)**

*Note 4: These additional requirements are the new requirements introduced by FAA AD 2005-08-01. There may be some overlap between the existing and the new requirements. Boeing Service Bulletin 747-53A2265 Revision 9 contains detailed accomplishment instructions for the new requirements introduced at this amendment.*

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*Note 5: The term “existing requirement” and “new requirement” are used to denote pre and post FAA AD 2005-08-01 requirements respectively.*

5. For Group 1 through 11 airplanes, conduct an internal detailed inspection for cracks of the left and right side body frames and adjacent skin between BS 420 and 460 inclusive and between stringers S-8 and S-12 inclusive, in accordance with the Figures 11 through 16 (BSB 747-53A2265 Revision 9).

*Note 6: Accomplishment of the 10,000 total flight-cycle (flight limit) inspection required by existing requirement 2 and new requirement 6 of this AD, or the initial inspection required by new requirement 8 of this AD, as applicable, is considered acceptable for compliance with the requirements of this paragraph.*

*Note 7: For Groups 1, 3 through 6, and 8 through 11 airplanes, the 8,000 total flight-cycle detailed inspection in new requirement 5 of this AD is a new flight limit inspection in addition to those inspections specified in existing requirement 2 of this AD. For Groups 2 and 7 airplanes, the 7,000 total flight cycle inspection in new requirement 5 of this AD is an addition to the existing 7,000 total flight-cycle (flight limit) inspection.*

6. For Group 1 through 11 airplanes, conduct an internal detailed inspection for cracks of the left and right side body frames and 10 adjacent skin/tear straps between BS 440 and 520 inclusive and between stringers S-6 and S-12 inclusive, in accordance with Figures 11 through 16 of the Accomplishment Instructions of Boeing service bulletin BSB 747-53A2265 Revision 9.

*Note 8: Accomplishment of the 13,000 total flight-cycle (flight limit) inspection required by existing requirement 2 of this AD is considered acceptable for compliance with the requirements of this paragraph.*

*Note 9: For Group 1 through 11 airplanes, the 10,000 total flight-cycle detailed inspection in new requirement 6 of this AD is in addition to the existing 10,000 total flight-cycle (flight limit) inspection in existing requirement 2.*

7. For Group 7 through 11 airplanes, conduct an internal surface HFEC inspection for cracks of the left and right side body frames between BS 420 and 460 inclusive and between stringers S-8 and S-12 inclusive, in accordance with Figures 12 through 16 of the Accomplishment Instructions of Boeing service bulletin BSB 747-53A2265 Revision 9.

*Note 10: Accomplishment of the initial inspection required by new requirement 8 of this AD is considered acceptable for compliance with the initial inspection required by this paragraph.*

*Note 11: For Group 7 through 11 airplanes, the HFEC inspection in new requirement 7 of this AD is an addition to each of the flight limit inspections.*

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8. For Group 7 through 11 airplanes, conduct an internal detailed and surface HFEC inspections for cracks of the body frames and adjacent skin between BS 420 and 460 inclusive and between stringers S-8 and S-12 inclusive, in accordance with Figure 17 of the Accomplishment Instructions of Boeing service bulletin BSB 747-53A2265 Revision 9.

*Note 12: These inspections (New Requirement 8) are to be repeated at intervals not to exceed 1,000 flight cycles until the next flight limit inspection specified by requirement 7, of this AD. These inspections (New Requirement 8) are to be conducted in between the flight limit inspections (New Requirement 7).*

9. In lieu of performing the repetitive detailed and surface HFEC inspections required by the new requirement 8 of this AD at intervals not to exceed 1,000 flight cycles, perform an internal detailed inspection for cracks of the body frame and adjacent skin between BS 420 and 460 inclusive and between stringers S-8 and S-12 inclusive, in accordance with Figure 17 of the Accomplishment Instructions of Boeing service bulletin BSB 747-53A2265 Revision 9.

- Compliance:
1. Before the accumulation of 8,000 total flight cycles, or within 10 flight cycles after receipt of this Directive, whichever occurs later. Inspect thereafter at intervals not to exceed 25 flight cycles.
  2. Inspect in accordance with Requirement 2 at the times specified in the requirements section, paragraphs 2A to 2E as applicable.

Modification in accordance with Boeing SB 747-53-2272, Revision 18 cancels the inspections per Requirements 1 and 2, together with Requirements 5 through Requirement 9 (inclusive) of this Directive for the modified areas only.

The internal inspections behind the Flight Engineer's panel (BS 340 to 390, from stringer 1R to 10AR) may, on Group 1, 2 and 3 aircraft, be deferred until 13,000 flights, provided that no critical element of the pressure shell structure within the corresponding location on the left hand side is severed or otherwise locally ineffective, or has been previously replaced or repaired due to fatigue damage.

Where internal inspections have been deferred, external skin inspections must be conducted in accordance with Boeing NDT Manual D6-7170, Part 6 Subject 53-30-00 Figure 2 at intervals not to exceed 1000 flight cycles.

*Note 13: For the purposes of this deferment, critical elements of the pressure shell structure shall include any frame, tear strap, skin or splice doubler, but may exclude the surrounding structure of the crew escape hatch (BS 340 to 380, S-1 to 3).*

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*Note 14: If failed structure has been found on the left hand side, an exemption may still be available from the Authority, (deferring the close detailed internal inspection on the right side for an interval of 1500 flights but not beyond 13,000 flights total), if it can clearly be shown, using alternative methods, that there is no major cracking of the corresponding element on the right hand side.*

3. Inspect in accordance with Requirement 3 before further flight after any frame cracks are found forward of BS 520.
4. Inspect in accordance with Requirement 4 before further flight after discovery of cracks longer than 25mm in any frame or floor beam, forward of BS 520.

*Note 15: Aircraft known to have unrepaired cracks shall not be returned to service without the prior approval of the Authority.*

*Note 16: For the purposes of this AD, flights on which the cabin pressure differential does not exceed 2.0 psi need not be counted.*

5. (a) For Group 1 through 6 airplanes: accomplish before the accumulation of 8,000 total flight cycles, or within 2,000 flight cycles after the effective date of this AD, whichever occurs later.
  - (b) For Group 7 through 11 airplanes that have accumulated less than 8,000 total flight cycles as of the effective date of this AD: accomplish before the accumulation of 8,000 total flight cycles, or within 750 flight cycles after the effective date of this AD, whichever occurs later.
  - (c) For Group 7 through 11 airplanes that have accumulated 8,000 or more total flight cycles as of the effective date of this AD: accomplish before the accumulation of 8,750 total flight cycles, or within 50 flight cycles after the effective date of this AD, whichever occurs later.
6. (a) For Group 1 through 6 airplanes: accomplish before the accumulation of 10,000 total flight cycles, or within 1,000 flight cycles after the effective date of this AD, whichever occurs later.
  - (b) For Group 7 through 11 airplanes: accomplish before the accumulation of 10,000 total flight cycles, or within 50 flight cycles after the effective date of this AD, whichever occurs later.
7. (a) For airplanes that have accumulated less than 8,000 total flight cycles as of the effective date of this AD: Do the inspection prior to the accumulation of 8,000 total flight cycles, or within 750 flight cycles after the effective date of this AD, whichever occurs later.

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- (b) For airplanes that have accumulated 8,000 or more total flight cycles as of the effective date of this AD: Do the inspection prior to the accumulation of 8,750 total flight cycles, or within 50 flight cycles after the effective date of this AD, whichever occurs later.

Repeat this inspection thereafter at intervals not to exceed the applicable flight cycle limits specified in existing requirement 2(A) to 2(E) as applicable.

- 8. (a) For airplanes on which any inspection required by the existing requirement 2 of this AD, has been done as of the effective date of this AD: Do the inspections at the later of these times:
    - (i) Within 750 flight cycles after the last inspection required by existing requirement 2 of this AD.
    - (ii) Within 50 flight cycles after the effective date of this AD.
  - (b) For airplanes on which any inspection required by the existing requirement 2 of this AD, has not been done as of the effective date of this AD: accomplish within 1,000 flight cycles after doing any inspection required by the new requirement 5 of this AD.
9. This inspection must be performed at intervals not to exceed 750 flight cycles. Operators may alternate the inspection methods provided that the corresponding repetitive inspection interval is not exceeded.

This Amendment becomes effective on 2 August 2007.

**Background:** This Directive was originally raised on 4 February 1986, following multiple instances of severe cracking on the forward fuselage Section 41. At the time, the requirements of this Directive exceeded those of Boeing SB 747-53A2265, Revision 8 and FAA AD 91-11-01, which has now been superseded by FAA AD 2005-08-01. The amended requirements reflect the results of inspections conducted in Australia and overseas in accordance with previous Directives.

Amendment 7 makes a correction to the provisions for terminating action for inspections required by Boeing SB 747-53-2272. Compliance with Revision 18 or later revisions of this service bulletin approved by FAA AMOC, cancels the inspections per Requirements 1 and 2, together with Requirements 5 through Requirement 9 (inclusive) of this Directive for the modified areas only.

### **Explanation of changes and additions introduced by previous amendment (Amendment 6).**

Amendment 6 restructured this AD by combining the requirements of the previous amendment of this AD with the requirements of AD/B747/324 and the new FAA AD 2005-08-01.



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The new FAA AD 2005-08-01 adds extra inspections, expands inspection areas and removes a one-time deferral of an inspection. This AD is prompted by reports of large cracks common to fuselage frames in the upper deck area, and severed or nearly severed adjacent frames, which if undetected, could lead to structural failure and cabin decompression.



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Delegate of the Civil Aviation Safety Authority

19 June 2007