

---

## AIRWORTHINESS DIRECTIVE

---

For the reasons set out in the background section, the CASA delegate whose signature appears below issues the following Airworthiness Directive (AD) under subregulation 39.1 (1) of CAR 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.

---

### Boeing 747 Series Aeroplanes

**AD/B747/280**

**Fuel Tank Pumps**

**12/2002  
TX**

Applicability: All model 747 series aeroplanes.

Requirement: 1. Remove the AFM revision required by AD/B747/279 Amdt 1.

2. Revise the Limitations Section of the Aircraft Flight Manual (AFM) by incorporating the procedures included at Annex A or Annex B to this Directive (this may be accomplished by inserting a copy of the applicable Annex into the AFM).

**The limitations contained in the Annexes to this Directive supersede any conflicting basic AFM limitations.**

3. Install placards as follows:
- a. **For Model 747-100, -200B, -200F, -200C, -100B, -300, -100B SUD, 747SR, and 747SP series aeroplanes** - Install the following placard on or adjacent to the flight engineer's fuel control panel:  
  
"AD/B747/280 fuel usage restrictions required."
  - b. **For Model 747-400 series aeroplanes** - Install the following placard on or adjacent to each pilot's primary flight display (PFD):  
  
"AD/B747/280 fuel usage restrictions required."
  - c. **For Model 747-400, -400D, and -400F series aeroplanes on which a horizontal stabilizer tank is installed** - Install the following placard adjacent to each pilot's PFD:  
  
"Use of horizontal stabilizer tank is prohibited."
4. Fuel pumps with the following part numbers (P/N) may not be installed on any aeroplane as a replacement part, unless the pump has been inspected to ensure that the wire bundle is properly routed in the pump since the most recent assembly of the end cap and motor-impeller housing (whether during manufacture, after maintenance or inspection, or after overhaul) in accordance with Boeing Alert Service Bulletin (ASB) 747-28A2248 dated 23 September 2002 or Crane Hydro-Aire Service Bulletin (SB) Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A, dated 17 September 17 2002:

**Boeing 747 Series Aeroplanes**

AD/B747/280 (continued)

<b>Aeroplane Model</b>	<b>Hydro-Aire P/N</b>	<b>Boeing P/N</b>
Model 747-100, -200B, -200F, -200C, SR, SP, -100B, -300, -100B SUD, 747SR, and 747SP series	60-72301-4	60B92603-418
	60-75501-4	60B92404-403
	60-75503-4	60B92404-404
	60-755100-4	60B92404-8
	60-72101-4	60B92603-26
	60-98976-4	60B89004-15
Model 747-400, -400D, and -400F series	60-98976-4	60B89004-15
	60-72101-4	60B92603-26

5. Fuel pump motor-impeller assembly having any part number may not be installed on any aeroplane in any pump position as a replacement part, unless the assembly has been inspected since the most recent assembly of the end cap motor-impeller housing (whether during manufacture, after maintenance or inspection, or after overhaul) using X-ray methods to ensure that the wire bundle is properly routed in the pump in accordance with Boeing ASB 747-28A2248 or Crane Hydro-Aire SB Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A.
6. Remove the Requirement 2 AFM revision and the Requirement 3 placards.
7. Remove the Requirement 3.c. placard

*Note 1: Requirements 6 and 7 are optional termination actions for the fuel usage restrictions at Requirement 2 and 3.*

*Note 2: FAA AD 2002-19-52 Amdt 39-12900 refers.*

Compliance: For Requirement 1 - Within 14 days after the effective date of this Directive.

For Requirement 2 - Concurrent with Requirement 1.

For Requirement 3 - Within 14 days after the effective date of this Directive.

For Requirement 4 - As of the effective date of this Directive.

For Requirement 5 - Within 14 days after the effective date of this Directive.

For Requirement 6 - When all fuel pumps for the centre wing tank, horizontal stabilizer tank, centre auxiliary tanks, together with auxiliary fuel tanks 1 and 4 on an aeroplane have been inspected using X-ray methods in accordance with Boeing ASB 747-28A2248 or Crane Hydro-Aire SB Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A.

## Boeing 747 Series Aeroplanes

AD/B747/280 (continued)

For Requirement 7 - When both horizontal stabilizer tank pumps have been inspected using X-ray methods in accordance with Boeing ASB 747-28A2248 or Crane Hydro-Aire SB Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A.

For Requirement 6 and 7:

Inspection of a pump by Crane Hydro-Aire before the effective date of this Directive is considered equivalent to an inspection performed in accordance with Crane Hydro-Aire SB Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A.

Inspection of a pump in accordance with Boeing ASB 747-28A2248 or Crane Hydro-Aire SB Crane Hydro-Aire Motor-Impeller-28-01, including Appendix A, before the effective date of this Directive is acceptable for removal of the AFM revision and placard.

This Airworthiness Directive becomes effective on 3 October 2002.

**Background:** The United States Federal Aviation Administration (FAA) has received reports indicating that fuel pumps on Boeing Model 737, 747 and 757 series aeroplanes have failed as a result of chafing of the stator lead wire bundle. This occurred when the stationary wire bundle came into contact with the rotor in the pump motor. The pumps failed when the pump power was short-circuited to the rotor and the circuit protection device tripped.

Examination of failed pumps showed that arcing had occurred in the pump bearings both inside and outside of the explosion-proof cavity of the pump. Such arcing could result in an ignition source in the fuel tank. The fuel pump failures have been attributed to the manufacturing assembly process during which the stator lead wire bundle was improperly installed and positioned in the end cap.

This Directive supersedes AD/B747/279 Amdt 1, which is cancelled. This Directive requires an amendment to the AFM which is intended to ensure that the centre wing tank pump inlets are covered with fuel during pump operation, preventing fuel vapours from coming into contact with any ignition source resulting from a fuel pump failure and installation of placards advising that fuel usage restrictions apply. The Directive also provides optional terminating action for Requirements 2 and 3.



Barry James Reid McKay  
Delegate of the Civil Aviation Safety Authority

2 October 2002

## Boeing 747 Series Aeroplanes

**AD/B747/280**  
**Annex A**

**Fuel Tank Pumps**

**12/2002**  
**TX**

**Model 747-100, -200B, -200F, -200C, -100B, -300, -100B SUD, 747SR, and 747SP**  
**Series Aeroplanes**  
**Aircraft Flight Manual Revision**

### Certificate Limitations

Fuelling and use of the centre auxiliary fuel tank and auxiliary fuel tanks 1 and 4 (if installed) is prohibited.

The centre wing tank (CWT) must contain a minimum of 17,000 pounds (7,700 kilograms) of fuel prior to engine start, if the CWT override/jettison pumps are to be selected ON during flight.

The CWT fuel quantity indication system must be operative to dispatch with CWT mission fuel.

Both CWT override/jettison pump switches must be selected OFF at or before the CWT fuel quantity reaches 7,000 pounds (3,200 kilograms), if the CWT fuel quantity is less than 50,000 pounds (22,700 kilograms) prior to engine start. The CWT override pumps may be selected ON during stabilized cruise conditions. Both CWT override/jettison pump switches must be selected OFF at or before the CWT fuel quantity reaches 3,000 pounds (1,400 kilograms).

Both CWT override/jettison pump switches must be selected OFF at or before the CWT fuel quantity reaches 3,000 pounds (1,400 kilograms), if the CWT fuel quantity is greater than or equal to 50,000 pounds (22,700 kilograms) prior to engine start.

Both CWT override/jettison pumps must be selected OFF when either CWT override/jettison fuel pump low pressure light illuminates.

Warning: Do not reset a tripped fuel pump circuit breaker.

Warning: Do not cycle the CWT pump switches from ON to OFF to ON with any continuous low pressure indication present.

Note: The CWT may be emptied normally in an emergency fuel jettison.

Note: In a low fuel situation, both CWT override/jettison pumps may be selected ON and all CWT fuel may be used.

If a centre wing tank pump fails with fuel in the centre tank, shut off the affected fuel pump.

If the main tanks are not full, the zero fuel gross weight of the aeroplane plus the weight of CWT tank fuel may exceed the maximum zero fuel gross weight by up to 7,000 pounds (3,200 kilograms) for takeoff, climb, cruise, descent, and landing, provided that the effects of balance (CG) have been considered.

## **Boeing 747 Series Aeroplanes**

AD/B747/280 Annex A (continued)

When refuelling centre or main wing tanks, the Fuel Pump Low Pressure indication lights must be monitored and the fuel pumps positioned to OFF at the first indication of fuel pump low pressure. Defuelling with passengers on board is prohibited.

**Boeing 747 Series Aeroplanes**

**AD/B747/280  
Annex B**

**Fuel Tank Pumps**

**12/2002  
TX**

**Model 747-400, -400D, and -400F  
Series Aeroplanes  
Aircraft Flight Manual Revision**

Certificate Limitations

Fuelling and use of the horizontal stabilizer tank (if installed) is prohibited if a placard prohibiting its use is installed.

The centre wing tank (CWT) must contain a minimum of 17,000 pounds (7,700 kilograms) prior to engine start, if the CWT override/ jettison pumps are to be selected ON during flight.

The CWT fuel quantity indication system must be operative to dispatch with CWT mission fuel.

Both CWT override/jettison pump switches must be selected OFF at or before CWT fuel quantity reaches 7,000 pounds (3,200 kilograms), if CWT fuel quantity is less than 50,000 pounds (22,700 kilograms) prior to engine start. The CWT override pumps may be selected ON during stabilized cruise conditions. Both CWT override/jettison pump switches must be selected OFF at or before the CWT fuel quantity reaches 3,000 pounds (1,400 kilograms).

Note: With CWT override/jettison pumps selected OFF and CWT fuel quantity greater than 6,000 pounds (2,800 kilograms), the FUEL OVRD CTR L & R EICAS messages will be displayed. Do not accomplish the associated non-normal procedure.

Both CWT override/jettison pump switches must be selected OFF at or before CWT fuel quantity reaches 3,000 pounds (1,400 kilograms), if CWT fuel quantity is greater than or equal to 50,000 pounds (22,700 kilograms) prior to engine start.

Both CWT override/jettison pumps must be selected OFF when either CWT override/jettison fuel pump low pressure light illuminates.

Warning: Do not reset a tripped fuel pump circuit breaker.

Warning: Do not cycle CWT override/jettison pump switches from ON to OFF to ON with any continuous low pressure indication present.

Note: The centre wing tank may be emptied normally during an emergency fuel jettison.

Note: In a low fuel situation, both CWT override/jettison pumps may be selected ON and all CWT fuel may be used.

If a centre wing tank pump fails with fuel in the centre tank, accomplish the FUEL OVRD CTR L, R non-normal procedure.

## **Boeing 747 Series Aeroplanes**

AD/B747/280 Annex B (continued)

If the main tanks are not full, the zero fuel gross weight of the aeroplane plus the weight of CWT tank fuel may exceed the maximum zero fuel gross weight by up to 7,000 pounds (3,200 kilograms) for takeoff, climb, cruise, descent, and landing, provided that the effects of balance (CG) have been considered.

When defuelling any fuel tanks, the Fuel Pump Low Pressure indication lights must be monitored and the fuel pumps positioned to OFF at the first indication of fuel pump low pressure. Defuelling with passengers on board is prohibited.