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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/PA-31/37 Amdt 10 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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### Piper PA-31 Series Aeroplanes

**AD/PA-31/37  
Amdt 11**

**Airframe Retirement Lives**

**3/2012**

Applicability: All Models.

- Requirement:
1. a. Retire the wing main spar lower cap and the pressure cabin (where applicable) before exceeding the times in service shown in the Retirement Schedule below; or
  - b. Adopt a CASA approved inspection program to allow operation beyond the retirement life specified in the Retirement Schedule below. Refer to Note 2 and Note 5 for guidance on developing an inspection program.
  2. a. Retire the remainder of the airframe after the expiration of two wing main spar lower cap lifetimes, Note 2 refers; or
  - b. Adopt a CASA approved inspection program to allow operation beyond the retirement limit of requirement 2.a. Refer to Note 2 and Note 5 for guidance on developing an inspection program.

### RETIREMENT SCHEDULE

Model	Wing Main Spar Lower Cap (hours)	Pressure Cabin (pressurised flights)
*PA-31	11000	N/A
*PA-31-300	15500	N/A
*PA-31-325	11000	N/A
*PA-31-350	13000	N/A
PA-31P	14000	10000
PA-31P-350	28000	10000
PA-31P-350 with 3368kg MTOW (STC 72-6)	23900	10000

## Piper PA-31 Series Aeroplanes

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PA-31T	12000	10000
PA-31T1	14500	10000
PA-31T1 with optional tip tanks	12000	10000
PA-31T2	11400	10000
PA-31T3	17400	N/A
PA-31T3 with optional tip tanks	13800	N/A

\* Aircraft which have been modified in accordance with Gippsland Aeronautics Pty Ltd. Engineering Release PA31-0001 (Model PA-31, -300, -325) or PA31-0002 (Model PA31-350), and which are subject to the related ongoing inspection program of ER PA31-0003, are exempt from the wing fatigue life limitation. The airframe life limitation of Requirement para 2 still applies.

*Note 1: The wing main spar lower cap comprises the complete spar cap assembly including the "T" section element, the nesting angles, and the reinforcing strips. It is recommended, but not essential, that the centre section splice plate be retired with the spar cap.*

*Note 2: The available fatigue data covers wing main spars and pressure cabins only. The durability of other parts of the airframe has not been evaluated, and is therefore unknown.*

*Based on experience, the Authority is prepared to credit unevaluated structure with a retirement life equal to double the life for the wing spar (Requirement para 2). An extension beyond this may be available, but any application must be supported by a fatigue substantiation covering all the remaining primary structure. This should include empennage, wing centre section, wing rear spar, control surfaces, unpressurised fuselages, etc. The substantiation may take the form of a sufficiently rigorous inspection program to ensure that any fatigue cracking which could occur in service will be detected before the aircraft is endangered.*

*Revised airframe lives approved against earlier issues of this Directive still apply.*

*Note 3. The model designations in the Retirement Schedule are as listed in FAA Type Certificate Data Sheets A2050 and A8EA. The variation between the popular and the official designation for some models has caused confusion in the past; AAC Articles 133-5 (August 1982) and 135-5 (October 1982) refer. All PA-31 series aircraft have life-limited wings. If your model is not listed in the Retirement Schedule, or if you are uncertain of the official model designation for your aircraft, please contact your CASA District Office.*

## Piper PA-31 Series Aeroplanes

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*Note 4. The requirement for tracking weights and average flight times has been removed as a result of a sensitivity analysis that was conducted. To operate beyond the retirement life refer to requirements 1.b. & 2.b.*

*Note 5. In developing an inspection program consideration must be given to the principles of damage tolerance. A Damage Tolerant analysis of critical parts is required such that inspections include probable locations of damage due to fatigue, corrosion or accidental damage per FAR 23.573(b). For guidance on this aspect, refer to FAA Advisory Circular 23-13A "Fatigue, Fail-Safe, and Damage Tolerance Evaluation of Metallic Structure for Normal, Utility, Acrobatic, and Commuter Category Airplanes".*

Compliance: Forthwith.

This Amendment becomes effective on 2 February 2012.

Background: The retirement lives promulgated in this Directive are based on fatigue tests and analyses conducted by the manufacturer. According to these evaluations, the risk of airframe cracking increases to an unacceptable level beyond the specified life limitations.

Amendment 11 provides alleviation to the retirement requirement of paragraphs 1.a. and 2.a. by allowing a CASA Approved Damage Tolerance inspection program as an alternative.

Amendment 10 became effective on 25 February 1999 and removed the requirement to record average weight and flight times. This was a result of a sensitivity analysis carried out by CASA on the relative effects of different sortie profiles and their relative effect on true fatigue life.

Amendment 9 of this Airworthiness Directive became effective on 27 December 1990.

Amendment 8 of this Airworthiness Directive became effective on 7 September 1975.

The original issue of this Airworthiness Directive became effective on 31 March 1975.



Mike Higgins  
Delegate of the Civil Aviation Safety Authority

2 February 2012