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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/BEECH 65/64 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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### Beechcraft 65 and 70 (Queen Air) Series Aeroplanes

**AD/BEECH 65/64  
Amdt 1**

**Wing Structural Fatigue Limitation**

**12/2010**

**Applicability:** All models listed in the Retirement Schedule below. For models not listed, the Authority must be contacted as a fatigue evaluation has not yet been carried out.

**Requirement** Retire from service the centre section and outer wing main spar lower caps, including the centre section to outer wing attachment fittings.

#### RETIREMENT SCHEDULE

Model	Retirement Life	Average Take-off Weight	Average Time per Flight Stage
65 A65	27500 hours	3200 kg	45 minutes
65-80	22000 hours	3350 kg	45 minutes
65-A80	13500 hours	3500 kg	45 minutes
65-A80-8800	10400 hours	3700 kg	45 minutes
A65-8200 70	13500 hours	3500 kg	45 minutes
65-B80	10400 hours	3700 kg	45 minutes

#### Operation beyond the Retirement Life specified in the Retirement Schedule

In order to adopt a safety by inspection program to allow operation beyond the retirement life specified in the retirement schedule, the following requirements must be met:

1. For centre section and outer wing spar caps and attachment fittings that have reached the retirement life, the registered operator must, before further flight, present a damage tolerance evaluation to CASA that demonstrates to CASA's satisfaction that the Beech SIRM inspections (Chapter 57-11-00, Chart 201) inspect these parts at all the probable locations of damage due to fatigue, corrosion or accidental damage, per FAR 23.573(b). See note 1.

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2. For centre section and outer wing spar caps and attachment fittings that have yet to reach the retirement life (and for which the operator wishes to extend operation beyond the retirement life), prior to reaching the retirement life, the registered operator must present a damage tolerance evaluation to CASA that demonstrates to CASA's satisfaction that the Beech SIRM inspections inspect these parts at all the probable locations of damage due to fatigue, corrosion or accidental damage, per FAR 23.573(b). See note 1.

If, after the damage tolerance evaluation is reviewed by CASA, the SIRM inspections are not found to comply with 23.573(b), then;

3. Before further flight beyond the retirement life, supplemental inspections with appropriate intervals must be developed to inspect areas of the spar caps and wing attach fittings that are not covered by the SIRM. See Note 1 for guidance. The supplemental inspections must subsequently be presented as instructions for continued airworthiness in accordance with FAR 23.1529 and approved by CASA.

If, after the damage tolerance evaluation is reviewed by CASA, the SIRM inspections are found to comply with FAR 23.573(b), then;

4. Continued operation will be permitted using the Beech SIRM inspections at the intervals specified in the SIRM (Chapter 57-11-00, Chart 201).

*Note 1: In developing supplemental inspections, consideration must be given to the principles of damage tolerance. For guidance on this aspect, refer to CASA Airworthiness Bulletin 02-007 Issue 7, in particular section 2.7 "how are SIDS developed". Whilst this AWB refers to Cessna SIDS, the principles explained are the same for every aircraft type. However, the principle guidance material is FAA Advisory Circular 23-13A "Fatigue, Fail-Safe, and Damage Tolerance Evaluation of Metallic Structure for Normal, Utility, Acrobatic, and Commuter Category Airplanes".*

*Note 2:*

*CASA AD/BEECH 65/22 requires inspection of the wing fittings and attachment bolts. These inspections have their own reduced intervals specified depending on the aircraft model. These reduced intervals take precedence over those in the Beech SIRM.*

*CASA AD/BEECH 65/57 requires inspection of the eight wing attach bolts and nuts per Inspection Index 10, Chart 201 of the Beech SIRM.*

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*Note 3: The Retirement Schedule is based on certain assumptions regarding average cruise weight, and also assumes one flight per hour. Should the average take-off weight, assessed over the life of the aircraft, be greater than the values shown in the Retirement Schedule, the registered operator must reassess the life limitation and submit the assessment to CASA for approval. Any weight increase above the type certificated weight, will require a re-assessment of the life limitation. Similarly, the Authority must be advised if the average time per flight stage (lift-off to touchdown) is shorter than the value shown.*

*Note 4: Some aircraft have been fitted with engines of a different type to the original, including IO-720 installation to US FAA STC SA444SW. The engine installation itself may affect the wing life limitation, as for some models there may be a resultant MTOW increase and thus NOTE 3 may be applicable.*

*Note 5: For aircraft which, because of an unusual operational role, have had individual life assessments approved by the Authority prior to 1 December 1988, those assessments still stand.*

*Note 6: On the basis of the currently available fatigue substantiation for the aircraft, only one spar cap replacement is permitted. Any proposal for a further extension in life incorporating a second spar change must be supported by a substantiation covering all the remaining primary structure including empennage, control surface hinge arms etc. This substantiation must incorporate a safe life assessment, or a sufficiently rigorous revised inspection schedule to ensure that any fatigue cracking which could occur in service will be detected before the aircraft is endangered. A third spar change will not be permitted.*

Compliance: As per requirement.

This Amendment becomes effective on 23 June 2010.

Background: This amendment is issued to allow continuation in service (of spar caps and wing attach fittings) beyond the fatigue lives specified in the retirement schedule, providing certain requirements are met.

Spar caps and wing attach fittings that have reached the life specified in the retirement schedule may not operate until the operator has completed a review of the Beech SIRM to determine if it inspects these parts at all of the probable locations and considers all possible modes of damage due to fatigue, corrosion or accidental damage, per FAR 23.573(b). If the review shows that the SIRM does not fulfil this requirement, supplemental inspections with appropriate inspection intervals must be developed to inspect the locations that are not inspected by the SIRM. It is the owner/operators responsibility to develop these additional inspections and no reliance should be placed on CASA to develop these inspections.

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### Background of previous revisions to this AD.

The Queen Air fatigue lives were previously promulgated by AD/BEECH 65/19, 20 and 21. They were reviewed in the course of assessing a re-engining modification which is applicable to all models. This review showed some inconsistencies in the lives, having regard to the fact that a range of models have structurally similar wings and should thus have the same life for a given configuration/weight etc. The inconsistencies have been resolved and all retirement lives now relate to a common basis of either short span or long span wing. Differences between models are accounted for purely because of weight/configuration.

Lives for some models have been extended slightly, but it has been necessary to reduce the 65-A80 life by 500 hours. A separate life has also been listed for the 65-A80-8800 which may appear to be a life reduction, but which is in fact consistent with the 65-A80 life taken in conjunction with the increased weight, in accordance with NOTE 1.

Because of the availability of modifications which may increase the MTOW for some models and hence lead to a life reduction, it has become necessary to list lives for the 65, 65-80 and A65 (short span) models which were previously not published because they were so long.



Mike Higgins  
Delegate of the Civil Aviation Safety Authority

16 June 2010