

AIRWORTHINESS ADVICE NOTICE:

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SUBJECT:

Service life limitation for gliders of glassfibre reinforced plastic construction.

GLIDER TYPES AFFECTED:

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All gliders of glassfibre reinforced plastic construction originating from, and type certificated in the Federal Republic of West Germany.

EXPLANATION:

A part of the design justification for glassfibre reinforced plastic (G.R.P.) glider structures of gliders type certificated by the Luftfahrt Bundesamt (L.B.A.) requires that the wing structure be subjected to a cyclic loading equivalent to a service life of 3000 hours with a minimum factor of three to account for the random variability of such testing. This means that such tests are required to be carried out to the equivalent of 9000 hours of operation to justify a "life" of 3000 hours.

At the end of the 9000 hours test the wing structure is loaded to its ultimate design load and if the wings sustain the ultimate design load before or without failure, no service life limit need be included in the type certification

It is not clear whether all type certificated gliders manufactured to this design requirement have a service life limited to 3000 hours and questions to the L.B.A. have not so far resulted in any resolution of this problem.

Due to the high utilisation of many gliders in Australia, resolution of the question of a life limitation is most important.

There is no known practical evidence of a "fatigue" type failure life limitation of 3000 hours and it is considered that experience of the failure modes of G.R.P. structures may permit of a "safe life" by inspection process to be adopted to substantiate continued flight in certain instances.

It should however be recognized that G.R.P. or composite structures using fibres other than glass are relatively new and long term affects are still largely unknown and the possibility of a definite service life limitation cannot be overlooked. Just as all aluminium alloy structure aircraft have a "fatigue" failure life limitation, this life for some types is so long that it has no practical significance. This may also be the situation with G.R.P. gliders.

In view of the certification basis for these aircraft the Department of Transport has already grounded one Libelle H201 glider upon reaching 3000 hours and have advised that similar action will be necessary on all West German IBA certificated glass reinforced plastic gliders until such time as revised lives are approved.

The Department and the Gliding Federation have taken up this matter with the German IBA in an attempt to obtain a technical justification for extending the service life of these aircraft.

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