AIR REGISTRATION BOARD

G59

REF. GSL2108

AIRWORTHINESS APPROVAL NOTE NO. 11002

APPLICANT: Slingsby Sailplanes

AIRCRAFT TYPE: Slingsby T61A

REGISTRATION. G-AYSD

SEE ADD 1.

CONSTRUCTOR'S NO. 1726

Design Approval for Special Category Certification

1. Introduction

The Slingsby T61A Self-Launching Glider is the Slingsby version of the German Scheibe SF.25.B. Falke, built under licence in the UK. As a Self-Launching Glider the only main difference between this and a conventional glider is the addition of a power unit enabling Self-Launched and Self Sustained flights to be performed.

A German Certificate of Airworthiness exists for this type and this AAN deals with the investigation for recommending the issue of a UK Certificate of Airworthiness.

2. Investigation

The Scheibe SF.25.B. Falke is a two place Self-Launching glider, with low wing configuration, engine in the nose and side by side seating. It has been produced in quantity in Germany and the design is approved in Germany by LBA Data Sheet No. L-653. Those gliders produced in Germany have been issued with a full German Certificate of Airworthiness. The Airworthiness Requirements to which the Scheibe SF.25.B. Falke has been designed and built in Germany are the LBA "Airworthiness Requirements for Sailplanes", plus LBA Information Sheet No. 10.05 entitled "Preliminary Regulations for the Test and Approval of Powered Gliders" as issued on 8th January, 1959 together with amendments to Information Sheet No. 10.05 dated 14th April 1967.

For UK Certification the LBA Requirements as adopted in Germany have been used plus the following special conditions:-

(a) The fuel system must be re-designed so that in the event of a fuel pipe rupturing in the cockpit, the tank contents are not emptied into the cockpit.

This action has been covered by Slingsby Drawing No. T.61-50-5 and entails re-locating the fuel cock adjacent to the fuel tank, which is aft of the cockpit.

(b) The pitot head must be re-located on the wing instead of the fin, to ensure that the propeller slipstream does not affect the indicated airspeed.

This action has been covered by Slingsby Drawing No. T.61-00-4 and has been shown to be successful.

(c) The steel tubing used for primary structure must be of an approved aircraft specification.

This special condition was introduced due to a batch of specified commercial material showing an unacceptably large scatter in material

Distribution

~~Applicant~~

Cont'd . . . /

strength properties, some of which were below the minimum specification value for such commercial tubing.

(d) A placard must be displayed in the cockpit stating that "This aircraft must not be operated in conditions such that engine failure would be dangerous."

The reason for this special condition is that in the UK and Germany the power plant fitted to a Self-Launching Glider can be single ignition and need not be approved to the same standard as a normal aircraft engine. In addition to this the Stamo 1500 cc engine, which is based primarily on Volkswagen and Porsche components is not normally fitted with carburettor heating, hence carburettor icing could occur. It has, however, been shown that with the engine inoperative and without spoilers, this aircraft can achieve a glide ratio of 22 which is comparable with some normal gliders.

All four of the above special conditions are contained in the build standard for UK built aircraft requiring a Certificate of Airworthiness, this is confirmed on the Certificate of Design Reference AC/T.61/2 and defined on Slingsby Drawing No. T.61-00-0.

The Slingsby T61A conforms with the "Redhill 1969 Definition" and can hence be defined in the UK as a Self-Launching Glider.

A Winch Launching hook is fitted to this aircraft to enable it to be used as a normal glider should the need arise.

The manoeuvre load factors to which this aircraft has been designed are as follows:-

N1 5.3.
N2 4.0.
N3 -1.5.
N4 -2.65.

where N3 is applicable at VD. These load factors are greater than or equal to those given in BCAR Section E for gliders intended for cloud flying.

The undercarriage consists of a fuselage mounted mainwheel, steerable tailwheel and wing mounted outrigger wheels, hence taxying can be performed without external assistance.

3. Basic Data

Dimensions and Weights:-

Wing Span	50.20 Ft.
Length	24.90 ft.
Wing Area	188.00 ft. ^{2}
Aspect Ratio	13.40
Empty Weight	810 lb.
Max. AUW	1190 lb.
Disposable Load	380 lb.

Engine:-

Type	-	Stamo 1500 cc
BHP	-	45
Max Continuous	-	3100 rpm
Max Permissible (30 secs)	-	3500 rpm
Max Take-off (5 mins)	-	3200 rpm

Speeds:-

Max Permissible Speed	-	118 mph
Max Rough Air Speed	-	94 mph
Max Speed With Spoilers	-	118 mph
Max Winch Launch Speed	-	62 mph

Cont'd . . . /

4. **Flight Testing**

The aircraft has been flight tested by the applicant and was found to have acceptable performance and handling characteristics.

5. **Approval**

Having regard to the evidence provided by the applicant the design of this aircraft is of a standard acceptable to the ARB and it is therefore recommended that a Certificate of Airworthiness be issued in the Special Category.

22nd March 1971 ..... Date

E H Smith
.....
For Chief Technical Officer

AIR REGISTRATION BOARD

5A0K&

AIRWORTHINESS APPROVAL NOTE NO. 11002 Addendum 1 Issue 2

APPLICANT: Slingsby Sailplanes

AIRCRAFT TYPE: Slingsby T61A

T.61A

REGISTRATION: G-AYUP

CONSTRUCTOR'S NO. 1735

Design Approval for General Purpose Certification

1. Introduction

The design of the Slingsby T61A Self-Launching Glider was approved by first issue of AAN No. 11002 and a recommendation was made for the issue of a Certificate of Airworthiness in the Special Category. It was found necessary to restrict the approval to Special Category because of incidents of carburettor icing and a lack of any means of protection against carburettor icing. This AAN addendum deals with the investigation associated with recommending a Certificate of Airworthiness in the General Purpose Category and is primarily concerned with a means of protection against carburettor icing and a forward extension of the CG range.

2. Investigation

2.1. Carburettor Anti-Ice

The modification which has been incorporated into the build standard of any Slingsby T61A for which a General Purpose Certificate of Airworthiness application is to be made provides a means of pre-heating the air entering the carburettor intake. A box is mounted over the standard air intake and from this box runs a flexible metal pipe which attaches to a rigid pipe running through the exhaust silencer. If anti-ice is selected the intake air therefore must pass through a heated pipe contained within the silencer. A cockpit controlled selector valve is provided in the box on the carburettor and allows air which has not been pre-heated to be drawn from within the engine cowling.

A permanently open drain point has been provided on the box in order to prevent fuel which has been blown back, from running down the inside of the flexible pipe and into the silencer area, in accordance with BCAR Section K Chapter K.5-5.1.4. The rigid pipe running through the silencer has been made readily removable to facilitate inspection for corrosion or erosion. It has been agreed that only a fully open or fully closed selection of the valve is permissible.

Cont'd . . . /

Distribution

~~Applicant~~
A-& ~~C Sect.~~ A & C Section
~~Design Dept.~~
~~Surveyor-in-~~
~~Radio Surveyor~~
~~Licensing Sect.~~
~~Flight Manuals Sect.~~
~~Helicopter Sect.~~
~~U.S. Liaison~~
~~Power Plant Dept.~~

For Chief Technical Officer

Date

A flight test undertaken by the applicant showed that with an ambient temperature of 12°C and the valve closed the carburettor throat temperature was 14.5°C, thus giving an increase of 2.5°C due to heating within the engine cowling. When the valve was selected open the throat temperature became 63.5°C giving a total effective increase of 51.5°C above ambient, thus complying with BCAR Section K Chapter K5-5.2.1.1.(a).

2.2. Forward Extension of CG

The German built and approved Scheibe SF.25.B. Falke has a forward CG limit of 7.4 inches aft of datum but Slingsby Sailplanes only chose to have the T61A approved for a forward limit of 8.5 inches and hence only undertook flight tests for this forward limit. It has now been decided by Slingsby Sailplanes that it is advantageous to be able to use the 7.4 inch CG position as approved by the LBA. Flight tests undertaken by Slingsby Sailplanes have shown the aircraft to be stable at this forward CG position.

3. Approval

The Slingsby T61A is approved for operation when the CG is within the limits 7.4 inches to 12.9 inches aft of the wing root leading edge.

Having regard to the evidence provided by the applicant and having embodied the means of carburettor icing protection as described in this AAN, it is considered that the design of this aircraft or any other Slingsby T61A is of a standard acceptable for a recommendation to be made for the issue of a Certificate of Airworthiness in the General Purpose Category. This recommendation is made on the condition that a placard is fitted in the cockpit which only makes a fully open or fully closed selection of the anti-ice valve permissible.

This addendum has been re-issued to amend the aft limit of the CG quoted in the penultimate paragraph.

D. H. Smith
for Chief Technical Officer
Date. 5th [illegible] . . . .