

21/7/97

T61C

CIVIL AVIATION AUTHORITY

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AIRWORTHINESS APPROVAL NOTE NO. 11811

APPLICANT: Slingsby Sailplanes

AIRCRAFT TYPE: Slingsby T.61.C

REGISTRATION: -

CONSTRUCTOR'S NO. 1752

Modification No. 9
Introduction of Stamo MS.1500/2 in lieu of Stamo MS.1500/1 Engine
(Type designated as Slingsby T.61.C)

1. Introduction

The applicant has introduced Modification No. 9 which replaces the Stamo MS.1500/1 engine in the standard Slingsby T.61.A, by a Stamo MS.1500/2 engine, the aircraft thus modified being designated a Slingsby T.61.C.

Design approval for Special Category certification of the T.61.A was given by Airworthiness Approval Note No. 11002 dated 22nd March 1971 and Addendum 1 to that AAN dated 25th May 1971 gave design approval for General Purpose Certification.

2. Design Investigation

The Slingsby T.61.C is defined by Drawing No. T.61.C-00-1.

2.1 The Stamo MS.1500/2 Engine

The Stamo MS.1500/2 engine is a development of the Stamo MS.1500/1 engine and is approved in Germany by Type Certificate No. 4570 issued on 16th February 1972. The basic engine is unchanged but a Bosch electrical self-starter replaces the hand pull start facility and a Ducatti 25 amp Alternator is now fitted. An engine weight increase of 15 lb has resulted from these modifications to the engine and this, from a structural aspect, has been declared acceptable by the applicant.

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With the hand pull start facility a gear wheel located between the propeller and propeller mounting flange was driven by a smaller gear wheel connected to a pull cord in the cockpit. A gear wheel of approximately 1.5 inches greater diameter is now fitted in the same position and engaged by a car type starter gear. The electrical self-starter is mounted on top of the engine on the port side and engages by the starter gear throwing forwards.

The Alternator is located below the engine on the starboard side and is driven by a 'Vee' belt from a pulley attached to the propeller mounting flange.

2.2 Engine Installation

The engine installation is as shown on Drawing No. T.61.C-50-1. A weight increase of 15 lb. has not necessitated a change to the engine mounting method but the addition of the Alternator has made it necessary to put a bulge in the lower engine cowling and this is shown on Drawing No. T.61.C-10-4. Due to the possibility of damage to the lower cowling in the event of Alternator drive belt shredding or failure, it has been agreed to place a life of 300 hours on this belt.

A re-location of the carburettor hot air box has been necessitated by the introduction of the self-starter. The hot air box and carburettor air intake are now located on the starboard side of the engine as shown on Drawing No. DO1-T61-100.

The starter gear wheel, being of larger diameter than on the manual start engine and being attached to the propeller mounting flange, extends beyond the propeller spinner, into the cooling airflow. This protrusion into the cooling airflow is, however, not deemed sufficient to cause engine overheating. It is also considered that the addition of the Electrical Self-Starter and Alternator does not significantly affect the cooling airflow.

2.3 Electrical System

The location of electrical components and associated cable positioning is shown on Drawing No. T.61.C-00-1, the wiring diagram is Drawing No. T.61.C-50-2 Sheet 1 and the electrical cable schedule is Drawing No. T.61.C-50-2 Sheet 2.

A 12 volt lead acid battery is mounted on the starboard side of the aircraft immediately aft of the cockpit, the mounting is in accordance with Drawing No. T.61.C-10-11 and has been stressed to the maximum of the factors associated with BCAR Section K Chapter K3-8 or those associated with manoeuvre or gust loads. The battery feeds a battery master switch located on the instrument panel which in turn connects to the ammeter and starter solenoid, which is mounted on the forward face of the engine fireproof bulkhead. Owing to a voltage regulator not being fitted, a battery charge switch is inserted between the ammeter and alternator so that battery charging can be stopped when the ammeter reading approaches zero. As a precaution against hazard arising from battery fumes the battery is mounted in an airtight box which has overboard venting. A placard "NO NAKED FLAMES" is fixed adjacent to the battery box.

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A starter switch which requires the insertion of a key is fitted to the instrument panel alongside the ammeter, battery charge switch and battery master switch as shown on Drawing No. T.61.C-10-7.

The starter solenoid is a commercial part and in order to give indication of solenoid sticking, which would leave the starter in engagement, a warning light is connected to the starter to solenoid feed cable.

On Drawing No. T.61.C-50-2 Sheets 1 and 2 the cable specified for the battery to starter connection is Nyvin 4. It has been agreed, however, that a PVC insulated commercial equivalent can be used if the conductor area is not less than that of a 7/064 cable. In a similar manner it has been agreed that 7/036 may be used instead of Nyvin 10 and 1/1.38 mm may be used instead of Nyvin 14. These alternatives to the Aircraft Specification cables are given in notes on the appropriate drawings. It has also been agreed that the Battery Master Switch may be a Lucas Pt. No. 76606 in place of the specified Bosch O.341.001.001 and this also is included in a note on Drawing No. T.61.C-50-2 Sheet 1.

2.4 Operating Weights and Centre of Gravity

The maximum AOW of the T.61.A was increased from 1190 lb to 1220 lb. by the introduction of Modification No. 1 and this was approved by AAN No. 11518 dated 22nd April 1971. This approval automatically extends to include the T.61.C as a derivative of the T.61.A. Embodiment of Modification No. 9 does not significantly affect the aircraft C.G.

3. Owners Handbook

In view of the fact that a voltage regulator is not fitted it has been agreed that a procedure be adopted whereby the pilot turns off the battery charging, by utilisation of the Battery Charge Switch, when the ammeter reading approaches zero. This procedure is detailed in Amendment No. 1 to the Owners Handbook.

4. Approval

Having regard to the evidence provided by the applicant it is agreed that Slingsby Sailplanes Modification No. 9 is approved for application to this or any other Slingsby T.61.A aircraft, subject to the following conditions:-

- (i) The aircraft is operated in accordance with the Owners Handbook with Amendment No. 1 embodied.
- (ii) The aircraft is built to the standard as defined by Slingsby Drawing No. T.61-00-1.
- (iii) The aircraft is operated within the limits of the Manoeuvre Envelope for Cloud Flying gliders as defined in ECAR Section E Chap. E.3-2.

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(iv) The aircraft is then designated as Slingsby T.61.C.

E H Smith
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for Civil Aviation Authority
Date . . . 22nd March 1972.