

## **IMPORTED HOMEBUILT AIRCRAFT**

### **1. Transfer to the LAA System**

First please be aware that amateur built aircraft in most other countries (including particularly, America) are not regulated to the same degree as in the UK, and therefore there may well be problems in transferring a foreign built homebuilt aircraft to the UK Permit to Fly system. LAA members have had bad experiences where amateur built aircraft originating from outside of the UK have been bought but on closer inspection have not been eligible for a LAA Permit to Fly, or have had to be drastically rebuilt to reach an acceptable standard.

The process for dealing with an imported aircraft which has been amateur built abroad involves:

1. Checking that the aircraft is of a type already accepted by the LAA.
2. Checking that the machine is genuinely amateur built (ie more than 51% built by the amateur builder) and falls within the weight, power and stall speed limits applicable to the LAA, and therefore can be dealt with by the LAA.
3. Checking that the aircraft has been built and maintained to an acceptable standard.
4. Checking that the design of the aircraft complies with the LAA approved design standard (drawings, manual etc), that it has an acceptable type of engine and propeller, and that no modifications to the aircraft have been made by the builder or subsequently in service. Any modifications or repairs which come to light must be scrutinised by the LAA and a decision made as to their acceptability, or the modifications must be removed.
5. Checking that any mandatory bulletins, Airworthiness Notices and Mandatory Permit Directives applicable to the airframe, engine, propeller or other components have been incorporated.
6. Checking the aircraft and engine logbooks for proper evidence of satisfactory recording of maintenance work, any repairs or accidents etc which may warrant further investigation, engine overhaul history and engine modification state etc.
7. Checking that radio equipment fitted is of a CAA or JAA approved type and obtaining a CAA radio installation approval. This is carried out by completing a standard LAA radio installation application form, obtained from LAA Engineering.
8. The aircraft must be fitted with UK required UK registration markings, UK placarding, UK instrumentation, UK fireproof metal ID plate.
9. A new set of airframe, engine and (for VP props) propeller logbooks must be raised of the UK approved format. Suitable logbooks are available from the LAA.
10. A LAA inspector must carry out a detailed inspection of the aircraft as described in Section 2. and submit a report describing his findings in relation to 1-3 above, and describing the aircraft, his inspections and any remedial work carried out, checks on control throws, fuel flow checks, engine ground runs etc. The inspector should be an inspector already familiar with the type of aircraft concerned.
11. The inspector must check the aircraft against the drawings and build manual and state if any variations exist.
12. In cases of doubt, one of the LAA staff Engineers will also visit the aircraft to check its condition.

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13. The aircraft must be re-weighed and a new weight schedule created validated by the LAA inspector, using a standard LAA weight and balance schedule form (obtained from LAA Engineering). It needs to be checked that the aircraft is not overweight or outside of cg limits when loaded to typical and worst case conditions.
14. An application must be raised for a permit to fly, using the LAA permit application form (not a renewal form). This form is obtained from LAA Engineering on request. The completed form is sent to LAA Engineering along with the weight schedule, radio application form, former logbooks, inspector's report, a clear photograph or two of the aircraft, the permit issue fee.
15. LAA Engineering will also need to be advised who is proposed will test fly the aircraft, and from what airfield. The pilot must be experienced in flying the type of aircraft concerned, or at least, aircraft of a similar or related type. The airfield must be suitable for the purpose of test flying ie adequate as regards size, surface, and maintenance facilities. Appropriate rescue facilities must also be available in the event of an accident occurring during the flight testing.
16. If all is satisfactory, LAA Engineering will then clear the aircraft for flight test and issue a flight test authorisation and flight test schedule. On completion of the testing, the test report is sent to LAA Engineering who will check the report and all being well, on resolution of any outstanding queries will submit a recommendation to the CAA that they issue the aircraft a Permit to Fly.

For help in locating a LAA inspector, if you do not already have one lined up, contact the LAA Chief Inspector Ken Craigie who can be reached at LAA Head office.

### **2. A Guide to Inspection**

The LAA is an organisation set up to oversee the building and operation of amateur built light aircraft. These aircraft are required to fall within the terms of the LAA's technical approval. It is vital before you purchase an aircraft that you establish that the particular aircraft you are acquiring is eligible for the issue of a Permit to Fly by the LAA.

The LAA technical terms of approval are:-

Minimum speed power off in the landing configuration not to exceed	- 60 mph EAS
Design dive speed not to exceed	- 250 mph EAS
Aircraft must be amateur built – by its owner	
Maximum number of seats	- 2
Maximum take off weight not to exceed	- 912 kgs (2006 lbs)
The installed power not to exceed	- 260 hp
(multi engine configurations to be considered within this total installed power limit)	

There are examples of types on the LAA register that do not strictly meet all of the above criteria, but each has been individually agreed with the CAA. The LAA also handles various examples of vintage commercially manufactured aircraft. However, the CAA has changed its policy on this issue and further examples can only be accepted in exceptional circumstances.

A similar position applies to imported aircraft for which there is no example already issued with a Permit to Fly by the LAA. Such aircraft will be subject to a design investigation, the outcome of which cannot be prejudged.

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In all cases it is essential to contact LAA Engineering in writing at the earliest opportunity, supplying the exact model number and if possible a serial and registration number. LAA Engineering can usually respond immediately to such applications referring cases to the CAA as necessary.

It is possible (and it has happened, even though the aircraft type is acceptable to the LAA in principle) that following inspection it will prove impossible to issue a Permit to Fly in respect of the particular aircraft. Certain conditions can come to light that cast doubt on the quality of build of an aircraft or on the integrity of the design or materials used. Particular problems occur when inspecting imported 'amateur built' aircraft, especially those where the primary structure is made from composite materials. Proof loading may be required. Additional inspection requirements may be required to be met and each aircraft has to be considered as a separate case.

The LAA does not require that imported aircraft possess an export C of A. Recent examples of aircraft which LAA Engineering staff have personally inspected have fallen far short of the standards required, even though an export C of A has been issued. The conclusion is that as far as the LAA is concerned, no credibility can be given to the standard or extent of maintenance carried out on an aircraft prior to import nor to the standard of construction or even airworthiness of the design.

The following is the minimum level of inspection and modification required prior to the issue of a Permit to Test Fly by the LAA.

### **2.1 Airframe**

For aircraft that are imported disassembled (as most are) a thorough internal and external inspection of all components is to be carried out prior to assembly. In order to facilitate an adequate internal inspection of wings it may be necessary to remove fuel tanks, tip fairings, ailerons, flaps etc. Internal inspection of fuselages can usually be made possible by removal of seats and cockpit furnishings.

Control surfaces should also be inspected internally where possible. When this is not possible, and inspection of the rest of the aircraft has led to doubt then measures will have to be taken to facilitate such inspection.

For fabric covered aircraft not provided with access panels, inspection holes will have to be cut. These are best made good afterwards by the installation of removable inspection panels to allow subsequent inspections to be carried out. The sort of things that are being looked for during such internal inspection are corrosion and rot, damage, unauthorised modifications and repairs, conformity with drawings, security and proper installation of components, loose objects and general condition in respect of wear and tear. A special look out for damage sustained during dismantling, storage and shipping should be maintained.

Before assembly is the best time to inspect attaching bolts and other hardware for condition and suitability. Be aware that serious damage can result from improper assembly techniques. For an imported assembled aircraft these inspections are just as important although a little more difficult. It may indeed be necessary to dismantle the aircraft to achieve the required standard of inspection.

Rigging and symmetry checks should be carried out and results recorded.

Particular attention should be paid in order to satisfy the requirements of CAA Airworthiness Notices Nos. 20, 50 and 73. (Inspection of Fabric, Wooden and Metal Structures)

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### **2.2 Control Systems**

All flight control systems must be dismantled and checked. Bearings checked and lubricated. Bolts withdrawn and checked for wear. Cables removed and checked for fraying throughout their length. Pulleys and guides should be checked. These inspections are usually best done with the aircraft dismantled.

Care should be taken during re-assembly to ensure proper routing, tensions and locking of cables. Control movement checks should be carried out and results recorded.

### **2.3 Fuel System**

The fuel system is to be inspected throughout. Fuel tanks should be inspected internally for cleanliness. Fuel filters should be checked for cleanliness. Fuel vents, fuel drains and fuel cocks should be checked for satisfactory operation. Condition of all pipes should be checked, paying particular attention to grommets, proper routing and security. The whole system should be leak-checked. English equivalent fuel capacities and grades should be marked adjacent to fuel fillers. Fuel flow checks should be carried out and results recorded.

### **2.4 Instruments**

All instruments should be checked for security of installation and clarity in presentation. Instruments should be checked for satisfactory operation and to be making sensible indications. The altimeter(s) and the ASI(s) should be removed and check calibrated using proper test equipment.

Altimeters reading in inches of mercury should be changed for an altimeter reading in millibars or a reference table installed. The Pitot and static systems should be leak-checked and checked for proper routing etc. A compass swing should be carried out using proper calibration equipment and a deviation card fitted. Where it is not obvious instruments should be placarded as to their function and mode of indication. Particular attention should be paid to CAA airworthiness notices Nos. 53 and 54 (Vertical Speed Indicators and Instruments with Unusual Presentation).

### **2.5 Engine and Engine Installation**

A thorough inspection of the engine and engine installation should be carried out. All cowlings should be removed. All systems should be checked and serviced as necessary. Pay particular attention to the operation of engine controls (full and free movement) and satisfactory operation of carburettor heat systems. A cylinder compression check should be carried out and results recorded.

Flexible hoses should be checked. A pressure test may be desirable. The engine bearer frame is another area that needs careful inspection and rubber mounts should be checked for condition.

Look out for damage caused by heavy landings.

CAA Airworthiness Notice No.40 (Carbon Monoxide contamination) should be satisfied.

If an electrically operated engine starter and solenoid are fitted a starter warning light is required. CAA Airworthiness Notice No.33 refers. Engine ground runs should be carried out and results recorded. If there is no reliable documented history of the engine available it may be necessary to internally inspect the engine. Contact LAA Engineering for guidance in these circumstances.

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### **2.6 Propeller**

Propellers should be checked for condition. The requirements of CAA Airworthiness Notice and No.75 (Variable Pitch Propellers) should be noted. The LAA will need to be satisfied that the propeller fitted is suitable for a particular engine/airframe combination.

### **2.7 Electrical System**

The battery must be inspected for condition and security and all electrical circuits function checked. Corrosion around the battery area from acid spillage is a particular hazard.

### **2.8 Radio Installation**

If the aircraft is or is to be fitted with a radio then normal approval procedures apply. Contact LAA Engineering for advice. (The radio is required to be of a type approved by the CAA)

### **2.9 Cockpit Labels**

All switches and controls should be labelled as to their function and mode of operation.

A stainless steel plate upon which the aircraft registration is engraved should be fitted in the cockpit.

A placard stating:-

Occupant Warning  
THIS AIRCRAFT HAS NOT BEEN CERTIFICATED  
TO AN INTERNATIONAL REQUIREMENT

should be fitted in full view of the occupants. Two may be needed for a tandem seated aircraft. Other placards will be required. These will be tailored to suit each individual aircraft and will be notified by LAA Engineering.

### **2.10 Seat Belts**

The minimum requirement for seat belts for an aircraft in the UK is for a harness made up of a lap and one diagonal strap. In exceptional circumstances, where it is proved impractical to satisfy this minimum requirement an exemption may be granted to allow lap strap only. If the aircraft is to be cleared for aerobatics a four-point harness is required. Normal LAA modification procedures apply when fitting replacement seat belts.

### **2.11 Painting of Aircraft**

Many aircraft undergo a repaint before returning to the air in the proud hands of a new owner. Account should be taken of the standards required by CAA Notice No.38 (Painting of Aircraft).

### **2.12 Weighing of Aircraft**

Regardless of any weight schedules previously prepared, the completed 'ready to fly aircraft' must be weighed and a new weight schedule raised and a copy provided to LAA.

### **2.13 Airworthiness Directives**

Full compliance with all applicable airworthiness directives and Mandatory Permit Directives (MPDs) published by the airworthiness authority of the country of manufacture and by the CAA is to be shown and certified. This applies equally to airframe, engine, propeller and accessories such as magnetos, instruments, seat belts, etc. If compliance can be traced to original log books then this will be adequate but if not re-certification of compliance will be necessary.

Manufacturers Service information in the form of Service Bulletins, etc are not mandatory but of course they are good advice and should be taken into account.

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### **2.14 Duplicate Inspections**

These are required following any work carried out to engine or flying control systems.

### **2.15 Registration**

Before a test flight can take place the aircraft must be registered in the UK and the registration mark applied in accordance with Air Navigation Order. To register an aircraft, contact:

Aircraft Registration Section  
CAA House  
45-59 Kingsway  
London  
WC2B 6TE  
Telephone: 020 7453 6666

### **2.16 Test Flight**

A satisfactory test flight must be carried out before a Permit to Fly can be issued. Authorisation to carry out that test flight can only be issued by LAA Engineering. LAA Engineering will issue such authorisation when it is satisfied that the aircraft has been inspected to a satisfactory standard and any other investigations are complete. An aircraft presented to the LAA for authorisation to test fly is required to be as airworthy and complete as if it were being presented for issue of the Permit to Fly.

### **2.17 Inspectors**

Before starting any work on a LAA aircraft it is vital to establish contact with a LAA inspector willing to take on the task of inspection.

It is your inspector who takes responsibility for the inspections and work carried out and it is for him to decide what level of involvement he needs to take and to what depth inspection, beyond the minimum, is required.

### **3.0 Summary**

The foregoing is meant to be a guide only to the minimum that is thought to be adequate to ensure high standards of airworthiness of imported aircraft brought onto the LAA 'register'. The CAA L.A.M.S. annual inspection is recognised as an excellent guide to the successful completion of these inspections.

No two aircraft are exactly alike and the level of rectification work required following these in depth inspections will vary from aircraft to aircraft. LAA Engineering reserves the right to call for any additional inspections or rectification work it feels necessary in the interest of air safety and standards. Photographs are to be provided with the application.

It is hoped that this has been a useful guide to those involved with the import of LAA aircraft. Please contact LAA Engineering if you have any queries.