

CONTINUED AIRWORTHINESS

Maintenance

The ANO requires that a Permit to Fly aircraft be maintained in an airworthy condition. This means that it must be in a condition for safe flight. This is achieved by carrying out regular checks on its physical condition (eg checking for corrosion, rot, wear, etc) and whatever servicing tasks are needed to preserve its condition and prepare it for future use. The scope of these tasks depends greatly on the age of the aeroplane and its storage conditions. External inspections and simple servicing tasks such as oil and filter changes, lubrication of hinges, polishing out any corrosion and touching up the paintwork, checks on propeller bolt torque and valve tappet clearances are needed frequently, typically every 50 hours flying. More in-depth checks such as internal structural inspections of wings and tail surfaces are carried out much more rarely, as for example when re-covering a fabric covered aeroplane at intervals of ten or fifteen years.

The program of work needed to maintain the aeroplane is called a **maintenance schedule**. Aircraft with a C of A are all required to be maintained exactly to a stated maintenance schedule, usually either laid down by the aircraft's manufacturer or a general-purpose program such as the CAA's LAMS (Light Aircraft Maintenance Schedule). By contrast, apart from a few four seat types such as the Jabiru J400 and Jodel 1050, LAA Permit aeroplanes are not legally tied to any specific maintenance schedule other than those checks listed in the LAA's annual check requirements stated on the Permit Renewal form. This gives owners (in consultation with their inspectors) the freedom to decide on their own maintenance program for keeping the aeroplane airworthy in between annual checks, and for scheduling those more significant tasks such as recovering a fabric covered airframe, overhauling the engine which is past its TBO etc. The program of work will depend on such things as the amount and type of use the aeroplane gets (hard usage causes wear and tear, but rarely-flown 'hangar queens' can suffer equally seriously due to the insidious effects of damp and corrosion) and the type of storage which the aeroplane enjoys. For most modern LAA kitplanes, maintenance schedules for both airframe and engine are provided by the respective manufacturers, and when available these should be followed – if not then you should base your schedule on the CAA LAMS schedule, which you can download from the CAA website.

As well as ensuring that the aeroplane is maintained in an airworthy state, the owner is required to keep proper maintenance records, as described under 'logbooks'.

Duplicate inspections are required whenever engine or flying controls are disturbed. Each part of such inspections should be signed by a suitably approved LAA inspector or suitably licensed CAA Engineer. Where there is no possibility of such a person being available, an owner/pilot who is also a member of the LAA may sign the second part of the duplicate inspection. When doing so, the owner/pilot must include his pilot's license number with his signature.

In addition, keeping the aeroplane airworthy involves ensuring that it embodies any necessary **continued airworthiness instructions** that may have been issued since the aeroplane (or its engine, propeller other equipment), was first introduced, usually based on experience with the type in the field. For many types, there is a confusing amount of information from different sources and owners sometimes having difficulty getting to the bottom of it.

Continued airworthiness information for permit aircraft takes the form of Mandatory Permit Directives, Airworthiness Directives, LAA modifications, manufacturers service bulletins and type club newsletters. Taking each of these in turn:

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Mandatory Permit Directives (MPDs)

These are legally mandatory bulletins issued by the CAA, who send copies directly to owners of the type of aircraft concerned at the time each bulletin is issued. Failure to comply with the requirements of an MPD renders the Permit to Fly invalid and any flight illegal. MPDs have been issued relating to many of the most popular LAA types, (see sidebar). Inspectors are sent copies of MPDs from time along with other updates for inclusion in their 'SPARS' book, but there is always the possibility that more MPDs may have been issued since the last send-out to inspectors. An up-to-date list of the latest MPDs is available by a link from the LAA's website.

Airworthiness Directives

Airworthiness Directives are issued by National Airworthiness Authorities (NAAs) such as the CAA and FAA, and intended originally to apply to aircraft with Certificates of Airworthiness, including the LAA's fleet of vintage ex C of A machines such as Cubs and Luscombes etc. They are not issued for homebuilt aircraft types. However ADs are often issued relating not to aircraft types specifically but rather to types of certified engine, propeller or even to small pieces of equipment such as seat harness buckles or magneto switches, which may be found to be installed on a whole raft of different aircraft types including homebuilts.

In the last year or so EASA has started to issue Airworthiness Directives, and increasingly in future ADs will be issued by EASA rather than the NAAs.

LAA policy has always been to require Airworthiness Directives to be complied with on LAA aircraft even though they don't have a Certificate of Airworthiness. A broken crankshaft on a Lycoming engine is just as life-threatening if it happens to be fitted to a LAA Vans RV6 as it would be if the engine were fitted to a C of A Cessna 172, so if an AD calls for crankshaft crack detection on the Cessna it is just as important to do it on the RV. Nevertheless, this remains a matter of LAA policy rather than a legal requirement for LAA homebuilt aircraft. However, if LAA insists on an AD being complied with before issuing or renewing your aircraft's Permit to Fly (and we do!) then were you subsequently to fail to comply with the AD then the aeroplane would no longer meet the requirements for permit issue and the permit would be invalidated, rendering flight illegal. On the other hand if a new AD is issued whilst your homebuilt aircraft already has a permit, it would not affect the legal status of the Permit to Fly and you could continue to operate it, (legally, if not sensibly) unless or until it were subsequently mandated by MPD action. Also of course, your LAA inspector will probably not want to know you if he finds that you are ignoring airworthiness directives.

In contrast, the CAA's MPD 1995-001 makes it legally mandatory for any relevant ADs to be complied with on LAA aircraft of types which once held a Certificate of Airworthiness. It is therefore essential that owners of ex Cof A machines keep tabs on what ADs may apply to their aircraft's airframe, engine, propeller and equipment, and the aircraft can only be flown legally if it is in full compliance with all ADs. The only exception to this is where LAA has negotiated with the CAA to seek a variation on an AD for LAA aircraft only.

For complete listings of ADs you would have to refer to the publications from the NAA of manufacture of the product (eg for a Lycoming engine, the FAA), the UK CAA, and, nowadays, EASA – not only for the airframe, engine, propeller, but also for all equipment fitted. This would be a monumental task and to this end we have presented details of ADs for most popular LAA types, including any special variations that have been approved for LAA aircraft only, in the LAA inspector's SPARS book where they appear sorted into airframe, engines propellers and equipment chapters. Please ask your inspector to show you the AD sections in SPARS for your aircraft – we cannot provide this service from the office as the workload would be immense.

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SPARS provides a ready source of information but be warned – SPARS is only updated from time to time so the information may not be bang up to date, also it does not cover all of the 300 plus

types of aircraft on the LAA system yet. The onus remains on you, the owner, to seek out AD information by the best means available. If the aircraft is a really rare bird not covered by SPARS, you will need to research the AD requirements yourself from scratch.

LAA modifications and bulletins

Over the years the LAA has generated many different modifications and safety bulletins for LAA type aircraft either in order to allow the type to be cleared in the first place or due to safety concerns raised later. Sometimes modifications are drawn up in detail for distribution to builders and owners, others are simply raised to rationalize and provide reference numbers for alterations to the design embodied by the manufacturer at LAA's request. The LAA only recommends issue or renewal of a Permit to Fly if all LAA mandatory modifications and bulletins (or some agreed equivalent) are embodied, as these form part of the accepted design standard for the aircraft. If you subsequently remove one of these mandatory modifications (or fail to comply with some recurring requirement of a LAA bulletin) then the aeroplane is no longer of the design standard that was cleared by LAA and therefore the Permit to Fly is invalidated, and any flight illegal.

Where the LAA issues a new modification or bulletin after the issue or renewal of your aircraft's Permit to Fly, failure to act on it does not invalidate your aircraft's Permit to Fly unless LAA chooses to back it up by arranging for the CAA to issue a corresponding Mandatory Permit Directive. However your inspector is charged with checking your aircraft for compliance with any LAA mandatory modifications listed in his SPARS book at each permit renewal, and should not sign off your permit renewal form if he becomes aware of any airworthiness actions being outstanding. Also, were the aircraft to have an accident due to failing to comply with a LAA airworthiness modification or bulletin then the owner might well be found negligent in not properly maintaining the aircraft in an airworthy state, and hence culpable for any consequences.

Details of LAA mandatory modifications are stated on the Airworthiness Approval Note (AAN) issued by the LAA when a new aircraft type is cleared, which are sent to all subsequent builders of the model concerned. Subsequent modifications or bulletins are sent to all builders and owners directly. We are presently preparing listings of all LAA mandatory mods for future publication on the LAA's website, which will be able to be immediately updated whenever any new information is issued.

Service Bulletins and Service Letters

Service bulletins are issued by manufacturers of airframes, engines, propellers and equipment and contain much good safety advice, usually based on experience gained with the type in the field. Owners are advised to comply with manufacturer's service bulletins unless specifically advised to the contrary by the LAA. Despite what the classification on the service bulletin might imply, owners should be aware that actions called for by a service bulletin are not legally mandatory unless reinforced by the issue of an MPD or, for an ex C of A type, an Airworthiness Directive. Thus for example on the Europa (homebuilt), Europa modification 70 which fitted an improved tailplane mass balance was, on the advice of the LAA, made legally mandatory by the CAA's issue of MPD 2005:004. Similarly, the De Havilland Support Ltd Service bulletin TNS 37 (increased strength of seat harness cable) was legally mandated by the CAA on C of A Moth

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types by their issue of Airworthiness Directive 002-10-2000, and thus immediately became legally mandatory on LAA Moths by virtue of the 'universal' MPD 1995-001.

While service bulletins are not legally mandatory unless made so by an AD or MPD, we must emphasize that the LAA Permit to Fly also requires that the aircraft be maintained in an airworthy state, and part of this obligation includes taking into account any available safety advice and acting accordingly. Were your aircraft to crash and the cause put down to your having ignored a service bulletin, unless you could produce some very good argument to the contrary then the law might very well decide that you had failed to maintain the aeroplane

properly. Hence our recommendation to comply with service bulletins in a timely fashion, unless specifically instructed otherwise by LAA. Nowadays it is much easier to get hold of up to date service information than in days gone by, because most manufacturers and kit agents include the facility to download service bulletins directly from their websites.

Type Club Newsletters and other unofficial sources

There are a great many other sources of unofficial continued airworthiness advice available through type club newsletters, individual builder's websites etc some of which is sensible, some decidedly not. In many cases we welcome the free exchange of information between users, for example with tips on build techniques, sources of materials etc. However where it

involves any change to the aeroplane itself such advice has no proper standing. Modifying the aeroplane from the approved plan or kit standard based on advice from such sources would constitute an illegal modification and make the Permit to Fly invalid, and hence flight illegal. The only exception to this is where Type Clubs have gone to the trouble of applying for a 'standard modification' applicable to 'all of type' and this has been approved by the LAA, in which case you will find it listed as such on the LAA's website (TL 3.07).

Further Reading

SPARS (your inspector has a copy – ask him to go through it with you)
'Paperwork checklist' (TL2.01 from LAA website)
'Responsibilities of the LAA aircraft owner' (TL2.02 from LAA website)
Booklet 'Operating an aircraft on a LAA Permit to Fly' (available from LAA)

The following CAA CAPs can be downloaded from the CAA's website, or via a link from the LAA site:

CAP 659 CAA's guide to construction and approval of permit aircraft
CAP 661 Mandatory Permit Directives
CAP 393 Air Navigation Order - particularly part 3 section 11
CAP 523 Display of Nationality and Registrations Markings on Aircraft
CAP 773 Permit to Fly Aircraft