REVALIDATING YOUR AIRCRAFT'S PERMIT TO FLY

TL 2.00
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INTRODUCTION

Every aircraft flying on a Permit to Fly in the UK needs a regular check to help ensure that the aircraft remains airworthy and in a fit state for further flights. Just like a car and its annual MOT test, it's the owner's responsibility to keep the aircraft airworthy throughout the year, with an LAA inspector checking the aircraft annually to review the owner's good care of the aircraft and if necessary, advising the owner where remedial action is needed.

From 13 February 2023, the LAA's Permit revalidation process has been updated to make the process easier for the various people involved, and for the process to add more value to owners and their aircraft. A major element of this is the ability for people to submit documents electronically. Another element is the provision of more of the centrally held data on aircraft to be accessed by owners and inspectors. The process has also been revised to align it more closely with the requirements set out by the CAA.

At the current time, this revised process only applies to aeroplanes: gyroplanes continue to use the old process until the system for aeroplanes has bedded in and we'll then look to apply the same principles.

RELATED DOCUMENTS

TL 1.22 – Finding an inspector
TL 2.02 – Paperwork checklist
TL 2.11 – Aircraft placards, labels and registration marks
TL 2.19 – Generic maintenance schedule
Form LAA/PTF-REVAL – Permit to Fly revalidation application
Form LAA/ARR-1 (FIXED WING) – Permit to Fly airworthiness review report
Form LAA/CFS-1 (FIXED WING) – Permit to Fly revalidation check flight schedule
Form LAA/PFRC-1 (FIXED WING) – Permit Flight Release Certificate

PROCESS

The process is based around three main forms, one for each of the participants in the process outside of LAA Engineering:

1. A check flight form (form LAA/CFS-1) to record a check flight completed by a check pilot at some point in the 12 months prior to the Permit revalidation application being received by LAA (as long as it's after the previous revalidation application). This can be submitted any time after the check flight has taken place but to be received by LAA no later than one month after the date of the airworthiness review inspection, except where the check flight is delayed by the need to fly on an HQ-issued PFRC.
2. A Permit revalidation application form (form LAA/PTF-REVAL) that is submitted by the owner, to be received by LAA within one month after the date of the airworthiness review inspection. An application fee is also payable at this point via our webshop.
3. An airworthiness review report (form LAA/ARR-1) that is submitted by the inspector, to be received by LAA within one month after the date of the airworthiness review inspection.

Note that for each of the above, if an inspector-issued PFRC is required to enable a check flight, then the forms must instead all be received by LAA within one month after the inspector signing the latest PFRC.

All the forms are available to download from the LAA's website. The forms may be submitted by any of the following methods:

1. Completing electronically and emailing to LAA Engineering (see below)
2. Completing electronically, printing them out, signing and posting to LAA Engineering
3. Printing them out, completing by hand, signing, scanning and emailing to LAA Engineering

4. Printing them out, completing them by hand, signing and posting them to LAA Engineering

It's not necessary for each of the three forms to be submitted using the same method. For instance, your inspector might prefer to complete their form electronically, whilst you might prefer to complete your forms manually and post them in.`

The three forms are reviewed by LAA Engineering and if all is in order a new Certificate of Validity is generated and emailed to the owner or other person as specified by the owner on the LAA/PTF-REVAL form.

Please ensure that all forms are thoroughly checked for completeness and accuracy prior to submission – missing or incorrect information may lead to processing delays.

ELECTRONICALLY SUBMITTED DOCUMENTS

If submitting any or all of the forms electronically, the forms *must* be submitted with each form as a separate multi-page PDF document. This is so that the process at LAA Engineering can be kept as slick as possible. Submissions that are made using a separate PDF file for each page or submitted as images will be rejected as it simply takes too long for us to assemble the document into something that we can easily read and store!

PDF documents may be submitted by scanning paper documents using a scanner and creating a multi-page file for each form, and emailing these as attachments. Alternatively, the forms may be completed electronically, saved and attached to an email. When completing electronically, please 'flatten' the form before sending it either by 'printing to PDF' or electronically signing the form (so that the resultant file can no longer be edited).

Form LAA/PTF-REVAL is now also available on a trial basis as a partially protected Word document. If submitting this electronically by email, please save the completed form as a PDF form and email to LAA Engineering as an attachment.

When forms are emailed by the signee from *their own* email account, it is acceptable not to include a signature on the form – sending the form by email indicates the sender's confirmation that the declaration is agreed with on the date the email is sent.

PDF documents may also be created by scanning paper documents using one of the following mobile phone apps and emailing them to LAA Engineering:

Adobe Scan, CamScanner, Clear Scan, Genius Scan

When emailing forms:

- They must be emailed to permits@laa.uk.com
- Please include the aircraft's registration in the subject line/email title.
- It might be helpful to copy yourself on the email and check that the attached file includes the information that you intended (e.g. no fields have become blank).

Any enquiries can be made to the usual engineering email address of engineering@laa.uk.com

CERTIFICATE OF VALIIDITY EXPIRY DATE

A Certificate of Validity is issued by the CAA system when requested by LAA at the end of the revalidation process. The expiry date of this certificate is one year minus a day from the date of issue, except that if the issue date is not more than a calendar month prior to the expiry of the previous certificate, the anniversary of the expiry date is preserved.

For instance, if a certificate expires 15/11/23 then if the new certificate is issued between 15/10/23 and 15/11/23, its expiry date will be 15/11/24. For the same expiry date, if a new certificate is issued 14/10/23 then its expiry date will be 13/10/24; if it's issued 17/11/23, its expiry date will be 16/11/24.

The certificate expires at the end of the day of the expiry date. E.g. if the certificate expires 15/11/23, you may still fly until 23:59 on 15/11/23.

A Permit to Fly may be revalidated at any time. From October 2023, this 'date-shift' may be done by paying a fee that is proportional to the difference in months between the new Certificate of Validity and the existing Certificate of Validity. This is calculated by working out the number of months between the month that the previous Certificate of Validity was *issued* and the month that you submit the new Permit revalidation application. The new certificate would be valid for 12 months, as normal.

For instance, if the last certificate was issued in August 2023 and you submit the new revalidation forms in November 2023, the cost would be 3 months' worth of the normal fee and the new certificate would expire in November 2024.

Note that LAA Engineering is presently at its busiest in the spring and summer. Date-shifting an aircraft's Permit to Fly revalidation to the quieter months of November through to February will help reduce the peak work load in the busiest period of the year.

When taking advantage of this 'date-shifting' arrangement, please indicate on the space provided on the LAA/PTF-REVAL form how many months you're paying for. A new LAA/ARR-1 and LAA/CFS-1 will also need to be submitted.

This 'date-shifting' arrangement is not available if:

- The last Certificate of Validity has already expired.
- The aircraft has any open (not yet approved) modifications or repairs, unless agreed in advance with LAA Engineering.

PERMIT REVALIDATION APPLICATION

The Permit to Fly revalidation application form (LAA/PTF-REVAL) captures some basic administrative information regarding the application, as well as the owner's declaration.

If there is more than one owner, please complete the grid on page 2 for the additional co-owners.

When reviewing the application, if there are any queries on a particular form, LAA Engineering will contact the person who signed that form, but will also copy the person listed in the second block on page 1. Once the process is complete and the Certificate of Validity issued, it will be emailed to the person listed in the third block on page 1.

If seeking to 'date-shift' and revalidate a Permit early (see above), please indicate this and how many months you've paid for at the bottom of page 1. Note that if queries arise with the permit revalidation process which delay the issue of the new Certificate of Validity, and hence reducing the amount of date-shifting to less than that anticipated, an additional fee may be charged to make up the difference.

AIRWORTHINESS REVIEW FORM

The Permit to Fly airworthiness review report (LAA/ARR-1) records the checks that your inspector needs to make on the aircraft in order to recommend to us that the Permit be revalidated for

another year. It is based on the CAA requirements that we must follow for this process, which are published in BCAR Section A8-26.

Although maintenance may be done at the time of the airworthiness review, the purpose of the review is to audit how the aircraft has been cared for since the last review. It's a check that the agreed maintenance has been carried out, that any mandatory actions have been done, the aircraft is in an accepted design configuration, and that the aircraft remains in an airworthy state.

Detailed notes on how to complete the airworthiness review form can be found in appendix 1.

PERMIT TO FLY REVALIDATION CHECK FLIGHT (Note that this replaces TL 2.06)

INTRODUCTION

Every LAA Permit to Fly aircraft (except for a few pre-arranged exceptions) must undergo an annual check flight.

The check flight is used to verify that the aircraft is handling and performing as expected of the type: it's a time for a pilot to objectively assess the question 'is this aircraft normal?'. It's not intended to be a 'post maintenance check flight' and as such doesn't need to be done at the time of the annual inspection or airworthiness review. Having said that, if an aircraft has had work done on it, it's always sensible to treat the next flight as a check flight and be prepared for the work to have adversely affected something.

Modern EFIS 'glass cockpit' systems often come with the facility to record the various flight parameters. This information can normally be downloaded and viewed on computers after the event. This can be a very effective and safe way to record check flight results, as it avoids the need to record results, head down, during the flight. Observers can be carried but they must be briefed as to the purpose of the flight and what flight manoeuvres are involved. Note however the requirement to carry out the check flight within 90% of the aircraft's maximum total weight authorised (MTWA), unless previously agreed otherwise by LAA Engineering or stated in the airframe TADS.

The test flight will need to be carried out in reasonably calm weather in order to give meaningful results and to allow the dive to V_{NE} to be carried out without any risk of overstress. An adequate ceiling will be required to allow stall tests to be carried out at a safe height.

PERMIT FLIGHT RELEASE CERTIFICATE

A check flight can only be flown if the Permit to Fly is valid (has a current Certificate of Validity) or your inspector or LAA Engineering issues a Permit Flight Release Certificate (PFRC).

Following an inspection to check that the aircraft is airworthy and in a fit state for flight, a suitably qualified LAA inspector can issue a PFRC on form LAA/PFRC-1 for up to 30 days at a time, provided that the end date of the PFRC isn't later than 12 months after the expiry of the previous Certificate of Validity.

If the Certificate of Validity has expired for more than 12 months, then LAA Engineering will need to issue the PFRC – please submit the form LAA/PTF-REVAL and LAA/ARR-1 and pay the Permit to Fly revalidation fee. Please also pay the PFRC fee of £20 via the webshop and a PFRC will be emailed to you (the fee covers the first PFRC and one re-issue – subsequent re-issues are charged at £10 each, payable via the webshop).

A PFRC is only valid in UK airspace and therefore it is imperative that if an aircraft is likely to be abroad at the time the Certificate of Validity expires, the check flight is carried out whilst the Permit to Fly is still valid.

A copy of the PFRC, when issued, must be submitted to LAA Engineering with the other Permit to Fly revalidation documents.

Note that a PFRC may also be used to enable a ferry flight to or from a place of storage or a place where maintenance is carried out. Further details are given in the inspectors' SPARS document.

CHECK PILOT QUALIFICATION
The check pilot should be carried out by a pilot who has studied the check flight requirements and be fully capable of carrying them out. Many owners prefer to do the check flight themselves, and would not want to risk letting anyone else fly their prized machines.

Check flights may be performed by any pilot qualified to fly the type and who has a minimum experience of 100 hours flying as 'pilot in command' on class (e.g. SEP aircraft) and 10 hours 'pilot in command' on type or similar type.

Many pilots and owners may have many more hours but are out of practice at stalling, sideslipping, etc, and do not feel confident about carrying out the tests, and prefer to ask someone else to do this on their behalf. If you should be in this position, avoid the local 'ace of the base' whose experience in propping up the bar exceeds their actual competence with the stick and rudder.

Some busy owners are only too happy to leave the check flight to the maintenance organisation carrying out the Permit to Fly revalidation inspection, while some individual LAA Inspectors regard it as part of their responsibilities to carry out the check flight themselves. It is up to the owner to talk this through with their Inspector and to ensure that the check flight pilot is suitably insured.

CHECK FLIGHT SCHEDULE NOTES
Detailed notes on how to complete the check flight schedule can be found in appendix 2.

Appendix 1 – Notes on completing the Airworthiness Review Report LAA/ARR-1

The following notes have been produced to provide guidance to aircraft owners and Inspectors regarding the Permit to Fly revalidation Airworthiness Review Report.

SECTION 1: AIRCRAFT DETAILS

Please ensure that the information provided is accurate and, where applicable, consistent with that stated in the aircraft Operating Limitations document.

Engine and propeller designations should be complete, including all prefixes, suffixes and blade types, pitches, diameters, etc, as stated on the aircraft's Operating Limitations document, where applicable.

A propeller logbook is only required for (in-flight) variable pitch propellers. Details of other types of propellers should be recorded in the aircraft' airframe logbook.

SECTION 2: AIRWORTHINESS REVIEW PERIOD

Record the date that the previous airworthiness review (or Permit to Fly revalidation inspection) was carried out. This should be evident from the aircraft's logbooks.

Record the airframe hours that previous airworthiness review (or Permit to Fly revalidation inspection) was carried out at. This should be evident from the aircraft's logbooks.

If any significant, non-scheduled, work has been carried out on the aircraft (i.e. not routine maintenance called for by the maintenance schedule) during the airworthiness review period, record the basic details and submit copies of the associated worksheets, documentation and logbook entries. This should be evident from the aircraft's logbooks. PDF scans of the documentation can be emailed with the Airworthiness Review Report. Worksheet references for the inspection and any maintenance tasks can be recorded here.

SECTION 3: AIRWORTHINESS REVIEW DECLARATIONS

3a: MAINTENANCE

Record the reference of the maintenance programme that the aircraft is being maintained to and the scheduled maintenance checks carried out (i.e. 50 hour, Annual, etc) since the last airworthiness review or Permit to Fly revalidation.

Aircraft Maintenance Programmes: all Permit to Fly aircraft have to be maintained to an airworthy condition if they are to remain cleared for flight. In order to achieve this, each aircraft is now required to have an associated list of maintenance tasks and inspections to be carried out, called an Aircraft Maintenance Programme. The number and depth of the programme will vary from aircraft to aircraft, depending on the aircraft's complexity and utilisation.

For background information, LAA-administered aircraft are maintained under the LAA's CAA A8-26 approval and specifically as detailed in CAP 553 BCAR Section A, Chapter A3-7.

In A3-7 Part 12 c) 'Aircraft Airworthiness Reviews', it states that: *'all the maintenance due on the aircraft according to the maintenance programme has been carried out;'* Furthermore, in part 15 'Aircraft Schedule Maintenance Programme', 15.1: *'Maintenance of each aircraft shall be organised in accordance with an aircraft maintenance programme.'*

The following note follows the above statement:

'NOTE: A maintenance programme in this instance is defined as a list of maintenance tasks that will maintain the aircraft to an airworthy standard. The maintenance programme shall take account of any available manufacturer's information or data.'

As the requirement for aircraft to have a maintenance programme is stated in A3-7, LAA-administered aircraft are required to have a specific reference to the aircraft's maintenance programme in the Airworthiness Review Report. Where there is no specific manufacturer's maintenance programme for an aircraft type (refer to the appropriate TADS and Operating Limitations document), CAA CAP 411 'Light Aircraft Maintenance Schedule' (CAA LAMS) may be used (and referenced), or the LAA Generic Maintenance Schedule (LAA GMS).

The LAA Generic Maintenance Schedules have recently been amended to better reflect the LAA-administered aircraft types and their scheduled maintenance requirements. The various LAA GMS schedules (varying depending on elapsed calendar time and/or hours flown) can be downloaded from the LAA website and tailored to a specific aircraft.

Some LAA-administered aircraft are required to be maintained to a specific maintenance programme, such as EuroFOX, Bulldog, Chipmunk, Night/IFR and four-seater aircraft. In these cases, the required maintenance programmes are named on the aircraft's Operating Limitations document.

Additionally, it is becoming more common to find aircraft kit manufacturers producing their own maintenance programmes for their aircraft. These are often based around the GA industry standard 100 hour/12 month check cycle (whichever occurs first) and whilst some aircraft (such as glider tugs) will often hit the 100 hour limit first, most LAA-administered aircraft will remain on a calendar based inspection schedule.

The maintenance programme reference on the LAA/ARR-1 form might be 'CAA LAMS', 'LAA GMS', or 'G-ABCD MP/01', etc. Obviously, there should be some kind of paperwork trail to the quoted maintenance programme – i.e. a copy of it on the owner's file. It is not particularly onerous to modify one of the LAA GMS and once done, it can just be printed off and signed as required. Or an owner can (unless otherwise specified) produce their own, bespoke, maintenance programme (i.e. a list of maintenance tasks).

The aircraft's maintenance schedule should be agreed with the Inspector prior to the inspection being carried out and printed each time the maintenance inspection is performed, with each task being signed by the owner (where permitted under pilot-maintenance), or otherwise by the Inspector.

Further information on what is allowed under pilot authorised maintenance can be found in LAA Technical Leaflet TL 2.05: Pilot Maintenance .

3b COMPLICANCE WITH APPROVED DESIGN

The applicable airframe TADS and current TADS Issue number that were referenced for the aircraft's inspection, must be recorded. If there is currently no TADS for the airframe, 'TADS 000' should be checked and referenced on the LAA/ARR-1.

Mandatory placards are listed in the aircraft's Operating Limitations document and additional requirements and guidance can be found in LAA Technical Leaflet TL 2.11: Aircraft Placards, Labels and Registration Marks and TADS for the airframe type.

Mandatory placards include the statement *'Occupant warning: This aircraft has not been certificated to an international standard',* registration markings in accordance with CAA CAP 523 (unless a CAA exemption exists) and a fireproof metal plate.

Other requirements include ensuring upper torso restraints are fitted for all front seat occupants (unless a CAA-issued exemption exists).

3c MODIFICATIONS AND REPAIRS
If any modifications or repairs have been carried out during the airworthiness review period (or since the previous Permit to Fly revalidation), the LAA Engineering reference/approval numbers should be listed.

For any 'open' modifications or repairs, the status of these modifications and repairs should be recorded, i.e. state 'on hold', 'abandoned', 'work not started', etc.

Aircraft must not be flown if any modification work has been started, unless authorised by LAA Engineering. Inspectors cannot issue a Permit Flight Release Certificate when an aircraft has been modified or repaired and that work has yet to be approved by LAA Engineering, unless authorised to do so by LAA Engineering.

Modifications and repairs that have been approved by LAA Engineering, should be listed under the 'My Aircraft Data' section of the LAA website, once logged in. Access is now also provided to Inspectors to enable them to access certain information for aircraft that they are involved with.

3d SERVICE LIFE LIMITED COMPONENTS
Some aircraft types may have mandatory life limited components fitted: record details of any such components that are overdue replacement.

The requirement and wording for this information to be recorded is taken from CAA CAP 553 Section A3-7 'Aircraft Airworthiness Reviews', which LAA-administered aircraft must comply with.

Service life limited components are specific components that have a *mandatory* service life, as dictated by a manufacturer (but only when recorded in Chapter 4 of the relevant maintenance manual), by the issuance of an Airworthiness Directive or Mandatory Permit Directive, or as mandated by LAA via a Mandatory Technical Directive/Airworthiness Information Leaflet.

As an example, Chipmunks have mandatory service lives (mostly controlled by fatigue hours) on many components. These are called up in TNS138 which is mandated by a CAA Airworthiness Directive.

Engine overhaul requirements are 'recommendations' by engine manufacturers and are not 'service life limited components', therefore there is no mandatory requirement to have an engine overhauled at the manufacturer's recommended 'Time Before Overhaul'. This is the case for LAA-administered aircraft and even certified aircraft maintained under Part-ML. This is also the situation for propellers and other components and equipment.

However, in some instances, a manufacturer's maintenance manual may state that, for instance, an engine manufacturer's maintenance schedule must be complied with and that manufacturer's maintenance schedule may include reference to life limited parts or overhaul. If the Operating Limitations document for that specific aircraft requires compliance with a maintenance manual or schedule then those instructions must be complied with.

Further information may also be found in the relevant airframe, engine or propeller TADS.

3e DEFECTS
If any defects are discovered during the physical survey of the aircraft, if they are not rectified or carried forwards (if allowed) with some kind of control in place, the details should be recorded.

3f COMPLIANCE WITH ADs, MPDs AND MTDs
All applicable continuing Airworthiness Directives must be complied with. These include Airworthiness Directives (issued by the State of design and/or registration), CAA Mandatory Permit Directives and LAA Mandatory Technical Directives.

Refer to the relevant TADS for the airframe, engine and propeller for links to the various regulating authorities for applicable ADs and MPDs. If there is no airframe TADS for the type, refer to 'TADS 000: Generic TADS'.

The TADS are updated and amended as time permits, therefore TADS do not necessarily record all current applicable ADs and/or MPDs or MTDs. The associated regulating authorities' websites (e.g. CAA, FAA, OSAC, LAA, etc) should be checked for the current listing of applicable ADs, MPDs and MTDs.

LAA Mandatory Technical Directives were previously termed 'Airworthiness Information Leaflets' and these AILs remain applicable, with compliance as detailed in the specific documents.

A continuing airworthiness compliance statement should be produced and kept up to date. This may be held in the logbook 'pink pages' or a separate compliance document (such as produced in MS Word or Excel). When a separate compliance statement is produced, this should be referred to in the pink pages and a copy held with the logbooks. When an AD, MPD or MTD is complied with, this should also be recorded on the worksheets and/or in the relevant 'white' pages of the aircraft's logbooks.

3g WEIGHT AND BALANCE REPORT
It is recommended that all LAA-administered aircraft are reweighed every ten years. Aircraft weight can increase for a variety of reasons such as avionics upgrades, repaint, new interior trim and modifications.

It is always possible that an aircraft is lighter than previously weighed, especially with the advancement in modern weighing equipment.

A copy of the current weight and balance report should be kept with the aircraft documents that are readily available to the pilot and be presented to the LAA Inspector, as part of the annual airworthiness review.

3h DOCUMENTATION REVIEW
This is a list of documents that should be checked during the airworthiness review. Some documents may not be required for or applicable to a particular aircraft.

Note that microlight aircraft were previously required to hold a noise certificate for the installed powerplant configuration; however BCAR A3-7 still requires the airworthiness review to check that a 'noise certificate is current and valid, if required'. For all LAA aircraft at the present time this can be marked 'N/A' (not applicable).

4 PHYSICAL SURVEY OBSERVATIONS AND COMMENTS
The physical survey is the inspection of the aircraft as a whole and is identical to that previously required as part of the annual revalidation process of the Permit to Fly.

5 RECOMMENDATION FOR THE REVALIDATION OF THE PERMIT TO FLY
The recommendation is the actual signed declaration by the Inspector confirming that the aircraft is in a safe and airworthy condition and in compliance with the applicable TADS for the type (approved modifications, aside).

In signing the recommendation, the Inspector is recommending that the Permit to Fly should be revalidated.

A Permit Maintenance Release must also be signed in the aircraft's logbooks, stating that the Permit to Fly revalidation inspection has been carried out.

Appendix 2 – Notes on completing the Check Flight Schedule LAA/CFS-1

Note that these notes supersede TL 2.06 which has now been withdrawn.

The Permit to Fly Revalidation Check Flight Schedule (form LAA/CFS-1) is to be completed as follows:

SECTION 1: AIRCRAFT AND OWNER INFORMATION

a. Enter the aircraft's registration and type as it appears on the Permit to Fly.
b. Enter the name of the registered owner of the aircraft and their LAA membership number.
c. Enter the name and contact details of the person to be contacted with any queries on the form (usually the pilot).

SECTION 2: CHECK FLIGHT SCHEDULE

1: Pre-Flight Documentation Check

a. Confirm that the aircraft is currently UK registered by reviewing the aircraft's registration certificate.
b. Confirm that the pilot's experience is satisfactory: check flights may be performed by any pilot qualified to fly the type and who has a minimum experience of 100 hours flying as 'pilot in command' on class (e.g. SEP aircraft) and 10 hours 'pilot in command' on type or similar type.
c. If the previous Certificate of Validity has expired, confirm that a Permit Flight Release Certificate (PFRC) has been completed (see section in the main text of this leaflet).
d. Confirm that the insurance requirements are satisfactory, i.e. that the aircraft has current insurance and that it covers the check flight by the intended pilot.
e. Confirm that the mandatory placards are installed, correct and legible (see TL 2.11 for required placards).
f. Add any relevant comments.

2: Loading

The check flight pilot should be in possession of the current weight and balance schedule for the aircraft and the aircraft's Operating Limitations document.

Check Flight Schedule Notes:

a. Enter the take-off weight of the aircraft at take-off. This is the empty weight of the aircraft as given in the aircraft's weight report added to the payload (occupant weights, fuel load, baggage, equipment carried, etc). This must be as close to the maximum authorised weight for the aircraft as possible (as stated in the aircraft's Operating Limitations document) and at least 90% unless previously agreed with LAA Engineering or stated in the TADS for the type. The weight must not exceed the maximum authorised for the aircraft, as shown on the Operating Limitations document.
b. Enter the centre of gravity (cg) position of the aircraft at take-off. This is calculated from the weight and balance report for the aircraft, accounting for the distribution of the payload. The cg position must be within the limits stated on the aircraft's Operating Limitations document, using the same datum reference.
c. Add any relevant comments.

3: Engine Run and Ground Checks

Particular attention needs to be paid to the engine ground run checks if the aircraft has been worked on during its Permit to Fly revalidation inspection, prior to the flight.

All that is required is to allow the engine to warm up to its normal operating temperatures and then record the maximum static engine rpm, having been sure to position the aeroplane over a

piece of ground free of grit, etc, which might damage the propeller. Check all other instrument indications and that the engine controls operate normally. Causes for rejection would be any unusual instrument indication or control malfunction, or a maximum static engine rpm which was outside the permitted range. For many homebuilt aircraft the acceptable range is undefined, but most certificated vintage aircraft have specified limits in their Flight Manuals which should be complied with.

Check Flight Schedule Notes:

a. Ensure that the ground run is carried out in a safe area and on a suitable surface.
b. Run the engine up to normal operating temperature and check rpm, pressures, temperatures, ignition and carb heat drop, and general operation of the engine, propeller and fuel controls.
c. Caution: some high-performance aircraft may not be able to reach maximum static rpm safely without the aircraft being chocked and/or tied down. If maximum static rpm is not achieved, add a comment as to the reason (e.g. 'maximum brakes holding rpm').
d. Enter the maximum static engine speed (rpm) and the maximum and minimum oil pressures observed (including the units), and indicate whether the engine ground run was satisfactory.
e. Note that the engine static rpm must be within the maximum permitted by the Operating Limitations document – if it isn't, there may be a problem such as a misreading tachometer or a propeller of incorrect pitch.
f. Add any relevant comments.
g. Flying controls must be checked for appropriate backlash (that 'lost motion' or deadband in the controls when you reverse the direction of the control), friction levels, full and free moment and correct sense of control surface movement – these should all be normal for the type.
h. Add any relevant comments.
i. Instruments must be checked during the ground run that they appear to be indicating correctly. Note that there is a later check for correct operation of instruments at section 10.
j. Add any relevant comments.

4: Taxiing
The check flight schedule requires that the aeroplane is taxied out in the normal way, and to check for any abnormal features or inadequacies of the brakes, steering, controllability, etc. Common causes of rejection here would be stretched and ineffective tailwheel steering springs, unserviceable or wrongly adjusted 'break-out' tailwheel steering mechanisms, and snagging or uneven brakes.

Check Flight Schedule Notes:

a. Check that all aspects of the aircraft's ground handling whilst taxiing appears normal.
b. Add any relevant comments.

5: Take-Off
Please refer to the comments above for taxiing as they are also relevant to the take-off.

Check Flight Schedule Notes:

a. Take-off with full power and the aircraft configured in the normal configuration for the type and operating surface. Any unusual tendency to swing on take-off should be noted.
b. Add any relevant comments.

6: Climb

Although this check comes first on the check flight schedule, it is not necessary to carry out the climb test immediately after take-off. You may want to feel the aeroplane out first, or position to a piece of unrestricted airspace. The climb should, however, be done fairly early on in the check flight, so as to ensure that the total weight is close to that calculated, i.e. not too much fuel has been burnt off.

The aim of the climb check is to measure the rate of climb under steady state conditions at full throttle and check the engine operation under these conditions. Before starting this test, you should record the QNH and the outside air temperature. This information is required so that should the need arise, LAA Engineering can correct the measured climb rate results back to 'standard atmosphere' conditions, i.e. adjust the figures to account for the effect of the actual air density on the day. LAA Engineering would only normally have to do this if you have a marginal climb rate and do the test on a very hot day, and your recorded climb rate works out to be substandard.

It is important to carry out the climb in a piece of airspace free of turbulence, thermic or orographic activity which will upset the results - this means choosing a day when there is not too much wind, clear of cumulus type cloud and hilly areas.

It is not acceptable to fly along level at full throttle at 1000 ft, pull the stick back to climb and simultaneously start the stopwatch. The extra airspeed at the start would result in a 'zoom climb' in which the initial climb rate would be much higher than the sustainable rate. Assuming the climb test is not being made directly after take-off, the climb should be started by first setting the aircraft up in level flight at approximately 200 feet below the targeted 'start altitude'.

The airspeed should be slowly reduced to the best climb airspeed, at the same time reducing the throttle setting to maintain roughly level flight and the aircraft trimmed accordingly.

Once the correct airspeed is established, the throttle should be opened fully and nose raised into the climb, making whatever further trim adjustment is needed to stabilise at the best climb airspeed, at the same time making sure that the skid ball is accurately centred by proper use of the rudder.

The stopwatch should be started as you pass through the selected start altitude. It is important to concentrate on flying accurately straight ahead and in balance, at within 2 kts/3 mph of the trimmed airspeed, if necessary, weaving slightly for visibility ahead. If your aircraft is an RV or Pitts, then the test may only take 30 seconds or so. The lower-powered aircraft may spend 2 or 3 minutes in the climb up to the finish altitude.

Towards the end of the climb, the airspeed should be confirmed and the engine rpm recorded. At the finish altitude, the elapsed time should be noted.

Any significant degradation in the climb rate from that obtained in previous check flights must be investigated. It may be that the engine is no longer producing peak power for some reason, or for instance, a wooden propeller may be warping out of true pitch with age, or the aircraft may be 'out of rig'. The engine rpm in the climb should demonstrate that the propeller is suitably matched to the engine and airframe. The engine rpm at full throttle in the climb must not exceed the engine's maximum permitted rpm stated on the aircraft's Operating Limitations document.

Check Flight Schedule Notes:

a. Prior to the start of the timed climb, the aircraft should be established in a stable climb at the normal best climb speed, full throttle set and flaps and undercarriage retracted (as applicable).

b. Record the altitude at the start of the climb.
c. Airspeed in the climb should be kept within +/- 2 kts (3 mph).
d. Record the QNH, climb airspeed (and units), outside air temperature and the engine/propeller rpm in the climb.
e. Record the time taken to climb 1000 ft in seconds.
f. Add any relevant comments.

7: Stalls
The check flight schedule states that the stalls should be carried out at a safe altitude. What constitutes a safe altitude, will depend on the type of aircraft concerned: 2000 ft AGL might be appropriate for a microlight, whereas a pilot might want twice this height for a high-performance aircraft.

Depending on the aircraft type, you may not expect any dramatic stall characteristics to be revealed in straightforward stalls with the engine throttled back, but aircraft seem to be particularly good at springing a surprise on the unsuspecting, when there is not much height to play with. For example, the engine might stop mid-stall, therefore it is preferable to have a field within gliding distance, to have run through the engine restart procedure beforehand and have a 'decision height' in mind.

The stall should be approached in approximately level flight, with the throttle closed and the speed bleeding off very slowly, the airspeed dropping by roughly 1 kt/1 mph per second. It may take a few attempts to get used to bringing the stick back at the correct rate to achieve this and to use the rudder to keep the aircraft in balance, as the speed falls away. If the stick is brought back too quickly, the aircraft's nose will end up way too high, with the result that when the stall comes it is much more violent than is required and the nose will drop well through the horizon.

All that is required is a gentle stall, in which there should be plenty of time to note the airspeed at which stall warning starts (natural pre-stall buffet or artificial stall warning device) and the minimum airspeed achieved before the nose or wing starts to drop (or the control reaches the back-stop). As soon as this occurs, normal recovery action should be taken. Notice whether there has been any unusual tendency for a wing to drop or any other unusual characteristic such as a 'lightening off' of the rearward stick force just before the stall or tendency of the rudder to snatch at the stall.

Note the results on the schedule and then repeat the procedure with the flaps down. This time, particular care will be needed to avoid exceeding the flap limiting speed on the recovery from the stall.

Any significant change in the recorded stalls speeds or characteristics from those obtained in previous years, will require further investigation. It might be that the airspeed indicator needs to be recalibrated, or the pitot realigned, or it might be that the airframe or controls have been mis-rigged. Another cause might be that the wings have been re-covered and that small but vital stall strips were not been refitted afterwards.

Be aware of the fact that the loaded centre of gravity position and the piloting technique will probably have a significant effect on the stall results and different pilots may have approached the stalls differently and therefore the results might not be comparing like with like.

Check Flight Schedule Notes:

a. At a safe altitude, the aircraft should be stalled with the throttle closed, flaps and gear retracted (as applicable) and commencing with the aircraft in balance and the wings level.
b. The aircraft should be trimmed to approximately 40% above the stall speed and the control column pulled gently back so as to reduce the airspeed at a rate not exceeding 1

kt/1 mph per second then repeat with full flaps and undercarriage extended (as applicable).
c. If no flaps are fitted, the various stall-related speeds must still be recorded (in the 'flaps up' column).
d. Record the operating speed of the artificial stall warning device (if fitted), natural pre-stall buffet speed and the minimum airspeed achieved.
e. Confirm the behaviour of the aircraft during the stalls.
f. Add any relevant comments.

8. Maximum Speed Check

The purpose of this check is to demonstrate safe handling of the aircraft at Vne and to check that this can be achieved without exceeding the maximum permitted engine rpm. The Vne speed is that stated in that specific aircraft's Operating Limitations document and which overrules all other sources. Vne must never be exceeded under any circumstances. Beware of an inaccurate reading ASI – ASI's should be regularly checked to ensure they are reading correctly. Engine rpm data which exceeds the maximum permitted in the Operating Limitations document, will result in the Permit to Fly revalidation application being rejected.

The maximum speed check is to be made in smooth air conditions from a normal or high cruise speed. The aircraft is to be dived, reducing the throttle sufficiently to prevent engine over-speed and to allow the minimum dive angle possible, to its maximum specified speed (Vne) as recorded on the aircraft's specific Operating Limitations document. Check for any unusual behaviour and whether control forces appear normal. Controls should record a degree of self-centering to small movements. Keep the airspeed, engine rpm and temperatures within the maximum permissible limits.

Note: do not make any large control movements at nor near Vne. If any abnormal vibrations are detected, close the throttle immediately and raise the nose to slow the aircraft – resume normal flight once the vibration stops and a normal flying speed is attained – land as soon as practicable and thoroughly check the control systems.

Check Flight Schedule Notes:

a. Record the aircraft's published Vne as stated in the aircraft's Operating Limitations document.
b. Record the maximum speed achieved (which should be Vne).
c. Record the maximum engine rpm seen during the dive.
d. Add any relevant comments.

9. Simulated baulked landing

The aim of this check, is to show that the aircraft handles satisfactorily and that the engine responds properly when the throttle is opened up swiftly, during a go-around. This test is particularly relevant to the older types of engine which are prone to plug fouling after a long period of idling and, having simple carburettors, may be prone to a 'lean cut' when the throttle is opened too quickly. This might prevent the engine from responding promptly to opening the throttle, or may even cause it to stop altogether. Other engine types may suffer a 'rich cut' if the throttle is advanced too rapidly.

The method used is to set the aircraft up in a normal throttled-back approach, albeit at a safe altitude, then, when ready, open up the throttle rapidly and re-establish the aircraft in a maximum rate climb. The aim is not to slam the throttle open, but merely to open it fully and positively in one movement, as would occur in an actual go-around.

The aircraft handling aspects of a go-around very rarely present a problem. The only time that this may cause concern is with a design with a high engine thrust line (such as, for example, the

Quad City Challenger microlight) in which there is a marked nose-down pitch when the throttle is opened. In an extreme case, there might be a risk of the pilot, when carrying out an actual baulked landing, nosing the aeroplane into the ground before getting the pitch under control.

Check Flight Schedule Notes:

a. Confirm that the aircraft's behaviour was satisfactory (or not) in the simulated baulked landing.
b. Add any relevant comments.

10. Systems function

The function check simply involves running through all the aircraft systems and testing each system in turn for correct operation. This is broken down into the categories of controls, instruments, engine and propeller.

It should be checked that each flying control operates freely without undue friction or backlash, that the trimmer and their associated indicators work properly throughout the range and hold a set position rather than 'creeping back' under air loads and vibration.

Each flap position should be selected at the maximum appropriate and permissible flap lowering speed and it must be checked that operation is normal and that there is no undue change in lateral trim (i.e. rolling tendency) when the flaps are lowered, which would indicate that the flaps are not moving evenly, port and starboard.

All the instruments should be checked to ensure that they are functioning correctly, especially the primary flight instruments.

EFIS systems should be checked to ensure they are functioning correctly including the test of any back-up batteries and associated stand-by instruments. Back-up batteries are normally set up for a periodic self-test on the ground.

Engine checks include engine and propeller operation, indication and for undue vibration. Each fuel tank should be selected for at least 3 minutes to check that the fuel system is working correctly.

Check Flight Schedule Notes:

a. Confirm the checking of all aircraft systems.
b. Add any relevant comments.

11. Avionics

All avionics systems and devices should be checked to ensure that they function correctly.

As this could potentially involve a fair time spent 'head down' in the cockpit, it is a good idea to have someone else on board to either fly the aircraft or drive the avionics.

Check Flight Schedule Notes:

a. Confirm the checking of all installed avionics.
b. Add any relevant comments.

12. Landing

A normal approach and landing should be made and any unusual characteristics or unsatisfactory tendencies noted. Reasons for rejection would include inability to control the aircraft directionally after touchdown (assuming the conditions did not exceed the crosswind limits and normal

techniques are used), jammed undercarriage 'shock-absorbers', poor braking, undue tendency to lift the tail when brakes are applied and engine stopping on touchdown due to a too-slow idle or some other factor.

Aircraft fitted with a retractable undercarriage system should have the undercarriage retraction and extension systems checked at the maximum speed allowed. Ideally, the functioning of any emergency extension system should be carried out on jacks in a hangar.

Check Flight Schedule Notes:

a. Record the aircraft's handling during the landing and when on the ground.
b. Add any relevant comments.

13. Finally

After the flight, any adjustments or other corrective work required should be arranged between the owner and the aircraft's Inspector at the earliest opportunity so that the appropriate parts of the test can be repeated (if required) whilst still fresh in the pilot's mind.

A surprising number of Permit to Fly revalidations are delayed because the pilot carrying out the test has not recorded the information correctly on the check flight schedule.

Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com