British Microlighting

www.bmaa.org

MICROLIGHT GUIDE TO AIRWORTHINESS

BMAA TECHNICAL INFORMATION LEAFLET (TIL)

TIL 064 Issue 4 (Feb 2022)

GUIDE TO AIRWORTHINESS

CONTENTS

1. Introduction

This document is a brief guide to airworthiness, providing an overview of owner/operator responsibilities and basic descriptions and advice on a variety of associated topics. Please note all linked documents referenced in the printed version of this leaflet can be found at www.bmaa.org | www.caa.co.uk | www.easa.europa.eu

Arguably before, but certainly since 2004, BMAA has taken a holistic approach to airworthiness. Each element of our system is designed to work together in order to provide robust and effective airworthiness assurance.

The entire system is split into two main areas, initial and continued airworthiness. The fundamentals of each cover:

1.1 Initial Airworthiness (CERTIFICATION)

REGULATION – BCAR SECTION S, CS-LSA & CS-VLA: POH/AMM/IPC – these detail levels of maintenance and restrict who can perform it if necessary.

APPROVED DATA - HADS/TADS/AAN/MAAN: HADS/TADS are general data, AAN & MAAN tend to be more specific, e.g. per registration.

PERMISSION TO FLY (PART 1) – PERMIT TO FLY CERTIFICATE: To be valid, the aircraft must be maintained in an airworthy condition and in accordance with (IAW) applicable technical data. Please note this method covers the aircrafts' permission to fly at all times, not only once a year during the airworthiness review (the AR relates to CoV renewal).

1.2 Continued Airworthiness (POST CERTIFICATION, ONGOING REQUIREMENTS)

PERMISSION TO FLY (PART 2) – CERTIFICATE OF VALIDITY: Controlled by an approved organisation (e.g. BMAA) and only valid for a maximum of one calendar year. BMAA (sign-off for airworthiness review): performed by authorised members of staff.

RESPONSIBILITIES

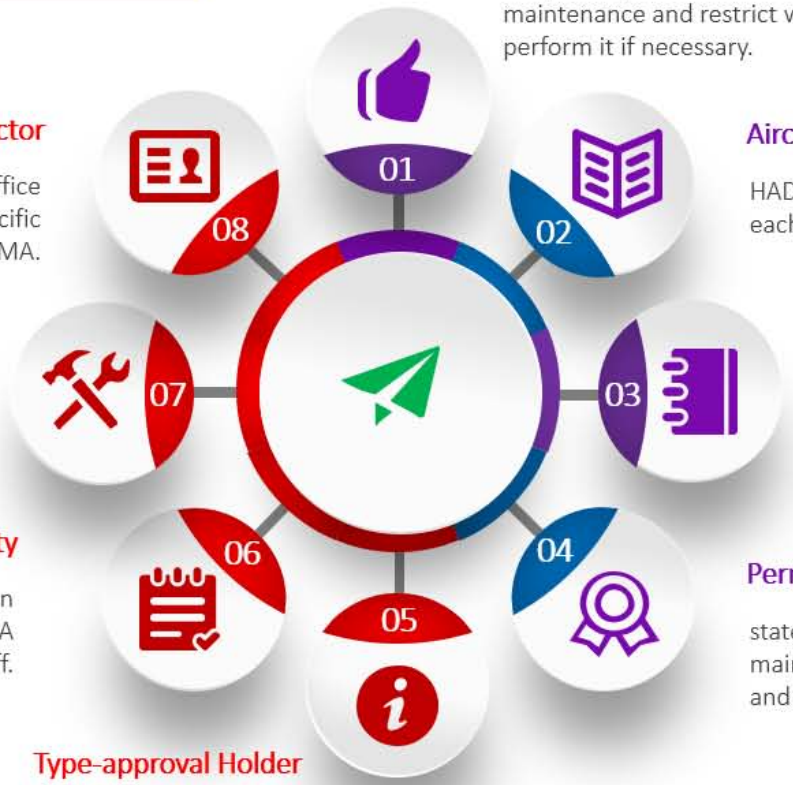
- **CAA:** Responsible for oversight of the BMAA approval.
- **BMAA:** Responsible to CAA for maintenance of our A8-26 Sporting Organisation Approval, which involves performing general oversight of all BMAA aircraft.
- **MANUFACTURER/IMPORTER:** Responsible to CAA and BMAA as appropriate to maintain approved data and provide support to the aircraft they produce or sell.
- **OWNER:** Responsible for maintenance IAW the Permit to Fly Certificate.
- **BMAA INSPECTOR:** Responsible to BMAA for auditing owner performance of their responsibilities IAW TIL044 SIGMA - Standard Inspection Guidelines for Microlight Aircraft

SUMMARY
The non-expiring Permit to Fly states the aircraft must be maintained and operated IAW the approved data. The type-approval holder (manufacturer) is responsible for producing and maintaining the approved data. The owner is responsible for airworthiness and can choose to do the work themselves or use someone suitable. The owner either ensures the Certificate of Validity is current via the BMAA airworthiness system, or the aircraft is not flown.
The pilot in command is responsible for ensuring each flight is legal. Anyone who performs maintenance is responsible for that work and must sign for it. All aircraft activities must be signed IAW BMAA Signatory Matrix. BMAA Inspectors are only authorised for and allowed to sign for very specific BMAA tasks.

CONTINUED AIRWORTHINESS

BMAA Airworthiness System

This diagram provides a simplistic overview of the BMAA Airworthiness System.



Certification

POH/AMM/IPC – these detail levels of maintenance and restrict who can perform it if necessary.

Aircraft Datasheets

HADS/TADS contain general data for each type and approved configurations.

Aircraft Approval Notes

AAN relate to manufacturer approvals & MAAN tend to be more specific and individual data, e.g. per registration.

Permit to Fly Certificate

states that the aircraft must be maintained in any airworthy condition and IAW with applicable technical data.

Type-approval Holder

This will be either the CAA (orphan types), BMAA or a CAA approved company (A8-1/A8-21).

Certificate of Validity

Valid for a specific time period, can only by renewed by BMAA or CAA authorised staff.

Owner

Responsible for maintaining the aircraft in an airworthy condition, which includes all associated records.

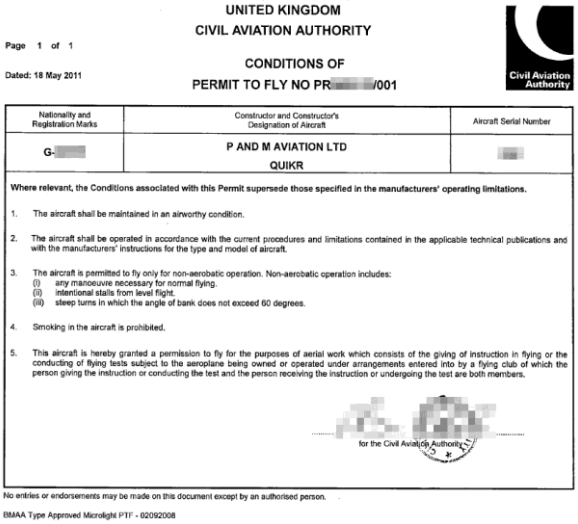
BMAA Inspector

Controlled by the BMAA Tech Office and tasked with performing specific actions only, IAW with TIL044 SIGMA.

INITIAL AIRWORTHINESS

1.3. Non-expiring Permit to Fly Certificate

Aircraft in the BMAA fleet operate on non-expiring Permit to Fly Certificates issued either directly by the British Microlight Aircraft Association or by the UK Civil Aviation Authority (CAA). They are available in three versions type-approved (factory-built), type-accepted (factory-built) and type-accepted (amateur-built). An example of each BMAA and CAA Permit to Fly and associated Conditions are shown below:



UNITED KINGDOM
CIVIL AVIATION AUTHORITY

Page 1 of 1

Dated: 18 May 2011

CONDITIONS OF
PERMIT TO FLY NO PR[redacted]/001

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-[redacted]	P AND M AVIATION LTD QUIKR	[redacted]

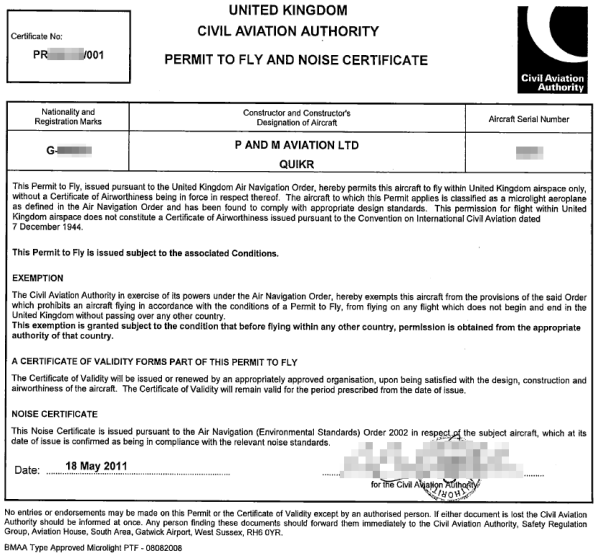
Where relevant, the Conditions associated with this Permit supersede those specified in the manufacturers' operating limitations.

1. The aircraft shall be maintained in an airworthy condition.
2. The aircraft shall be operated in accordance with the current procedures and limitations contained in the applicable technical publications and with the manufacturers' instructions for the type and model of aircraft.
3. The aircraft is permitted to fly only for non-aerobatic operation. Non-aerobatic operation includes:
   (i) any manoeuvre necessary for normal flying.
   (ii) intentional stalls from level flight.
   (iii) steep turns in which the angle of bank does not exceed 60 degrees.
4. Smoking in the aircraft is prohibited.
5. This aircraft is hereby granted a permission to fly for the purposes of aerial work which consists of the giving of instruction in flying or the conducting of flying tests subject to the aeroplane being owned or operated under arrangements entered into by a flying club of which the person giving the instruction or conducting the test and the person receiving the instruction or undergoing the test are both members.

for the Civil Aviation Authority

No entries or endorsements may be made on this document except by an authorised person.

BMAA Type Approved Microlight PTF - 02092008



Certificate No:
PR[redacted]/001

UNITED KINGDOM
CIVIL AVIATION AUTHORITY

PERMIT TO FLY AND NOISE CERTIFICATE

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-[redacted]	P AND M AVIATION LTD QUIKR	[redacted]

This Permit to Fly, issued pursuant to the United Kingdom Air Navigation Order, hereby permits this aircraft to fly within United Kingdom airspace only, without a Certificate of Airworthiness being in force in respect thereof. The aircraft to which this Permit applies is classified as a microlight aeroplane as defined in the Air Navigation Order and has been found to comply with appropriate design standards. This permission for flight within United Kingdom airspace does not constitute a Certificate of Airworthiness issued pursuant to the Convention on International Civil Aviation dated 7 December 1944.

This Permit to Fly is issued subject to the associated Conditions.

EXEMPTION

The Civil Aviation Authority in exercise of its powers under the Air Navigation Order, hereby exempts this aircraft from the provisions of the said Order which prohibits an aircraft flying in accordance with the conditions of a Permit to Fly, from flying on any flight which does not begin and end in the United Kingdom without passing over any other country.
This exemption is granted subject to the condition that before flying within any other country, permission is obtained from the appropriate authority of that country.

A CERTIFICATE OF VALIDITY FORMS PART OF THIS PERMIT TO FLY

The Certificate of Validity will be issued or renewed by an appropriately approved organisation, upon being satisfied with the design, construction and airworthiness of the aircraft. The Certificate of Validity will remain valid for the period prescribed from the date of issue.

NOISE CERTIFICATE

This Noise Certificate is issued pursuant to the Air Navigation (Environmental Standards) Order 2002 in respect of the subject aircraft, which at its date of issue is confirmed as being in compliance with the relevant noise standards.

Date: 18 May 2011

for the Civil Aviation Authority

No entries or endorsements may be made on this Permit or the Certificate of Validity except by an authorised person. If either document is lost the Civil Aviation Authority should be informed at once. Any person finding these documents should forward them immediately to the Civil Aviation Authority, Safety Regulation Group, Aviation House, South Area, Gatwick Airport, West Sussex, RH6 0YR.

BMAA Type Approved Microlight PTF - 08082008

ABOVE: A CAA Permit to Fly for a type-approved (factory-built) microlight.
On the left is the combined Permit to Fly and Noise Certificate[1]; on the right are the Conditions of the Permit.
A Permit to Fly is not valid without a valid Certificate of Validity.
BELOW: versions of the BMAA Permit to Fly Certificate

Certificate No:
PR[redacted]/001

UNITED KINGDOM
BRITISH MICROLIGHT AIRCRAFT ASSOCIATION

PERMIT TO FLY

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-[redacted]	ASCENT INDUSTRIES LTD EUROFOX 2K	[redacted]

This Permit to Fly, issued pursuant to Article 40 of the Air Navigation Order, hereby permits this aircraft to fly within United Kingdom airspace only, without a Certificate of Airworthiness being in force in respect thereof. The aircraft to which this Permit applies is classified as a microlight aeroplane as defined in the Air Navigation Order and has been found to comply with the appropriate design standards. This permission for flight within the United Kingdom airspace does not consitute a Certificate of Airworthiness issued pursuant to the Convention on International Civil Aviation dated 7 December 1944.

This Permit to Fly is issued subject to the Conditions listed on subsequent pages.

A CERTIFICATE OF VALIDITY FORMS PART OF THIS PERMIT TO FLY

The Certificate of Validity may be issued or renewed by an appropriately approved organisation, upon being satisfied with the design, construction and airworthiness of the aircraft. The Certificate of Validity will remain valid for the period prescribed from the date of issue.

Date: 24th January 2022

for the British Microlight Aircraft Association

Permit issued by the British Microlight Aircraft Association Ltd, CAA approval ref. DAI/8909/84

No entries or endorsements may be made on this Permit or the Certificate of Validity except by an authorised person. If either document is lost, the British Microlight Aircraft Association should be informed at once. Any person finding these documents should forward them immediately to the BMAA, Bullring, Deddington, Banbury, Oxfordshire, OX15 0TT

BMAA Type Approved Microlight - 20190415

Page 1 of 1

Dated: 24th January 2022

UNITED KINGDOM
BRITISH MICROLIGHT AIRCRAFT ASSOCIATION
CONDITIONS OF PERMIT TO FLY NO
PR[redacted]001

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-[redacted]	ASCENT INDUSTRIES LTD EUROFOX 2K	[redacted]

Where relevant, the Conditions associated with this Permit supersede those specified in the manufacturers' operating limitations.

1. The aircraft shall be maintained in an airworthy condition.
2. The aircraft shall be operated in accordance with the current procedures and limitations contained in the applicable technical publications and with the manufacturers instructions for the type and model of aircraft.
3. The aircraft is permitted to fly only for non-aerobatic operation. Non-aerobatic operation includes:
   (i) any manoeuvre necessary for normal flying.
   (ii) stalls.
   (iii) steep turns in which the angle of bank does not exceed 60 degrees.

Permit issued by the British Microlight Aircraft Association Ltd, CAA approval ref. DAI/8909/84

No entries or endorsements may be made on this Permit or the Certificate of Validity except by an authorised person. If either document is lost, the British Microlight Aircraft Association should be informed at once. Any person finding these documents should forward them immediately to the BMAA, Bullring, Deddington, Banbury, Oxfordshire, OX15 0TT

BMAA Type Approved Microlight - 20190415

NOTE: The Permit to Fly Certificate is only valid if all the conditions are met and a current Certificate of Validity (see chapter 5.1) is present. Legally, a physical copy of the Permit to Fly Certificate is required. If lost or the details are incorrect, BMAA have an approved procedure to produce a replacement, please click here - Replacement Permit to Fly Certificate

[1] Amateur-built aircraft built prior to 2019 had a separate Noise Certificate. CAA discontinued the requirement for regulated Microlights to hold a Noise Certificate at the same time.

1.4. Conditions of Permit to Fly Certificate

Both BMAA and CAA non-expiring Permit to Fly Certificates issued on or after 15th April 2019 state the following minimum conditions, which the owner/operator must observe at all times. If not adhered to, the Permit to Fly is invalidated and any flight undertaken illegal:

#1 **The aircraft shall be maintained in an airworthy condition.**

#2 **The aircraft shall be operated in accordance with the current procedures and limitations contained in the applicable technical publications and with the manufacturers' instructions for the type and model of aircraft.**

*#3*** *A Permit Maintenance Release shall be issued as appropriate in accordance with BCAR A3-7*[2]*.*

#4 **The aircraft is permitted to fly only for non-aerobatic operation. Non-aerobatic operation includes:**
- **i) any manoeuvre necessary for normal flying.**
- **ii) stalls.**
- **iii) steep turns in which the angle of bank does not exceed 60 degrees.**

*#5*** *The aircraft shall be flown by day in visual meteorological conditions only.*

*#6*** *Flight in icing conditions is prohibited.*

**Items 3, 5 & 6 apply to BMAA Very Light Aircraft (VLA) types, which are light aircraft and not Microlights. 5 & 6 do apply to Microlights, please see section 6 regarding Permit Maintenance Release and Pilot Maintenance.

1.5 Definition of Airworthiness

BMAA uses the CAA definition of airworthiness, as contained in CAA CAP 553 BCAR Section A - Airworthiness Procedures where the CAA has Primary Responsibility for Type Approval of the Product, section A3-7 Permits to Fly Aircraft - Initial and Continuing Airworthiness:

a) airframe, engine, and propeller flying hours and associated flight cycles have been properly recorded;
b) the pilots operating handbook, flight manual or permit flight conditions is applicable to the aircraft configuration and reflects the latest revision status;
c) all the maintenance due on the aircraft according to the maintenance programme has been carried out;
d) all known defects have been corrected, or carried forward in a controlled manner;
e) all applicable Mandatory Permit Directives and if applicable, Airworthiness Directives to the aircraft, engine and propeller, including components or equipment as may be fitted to the aircraft, have been applied and properly recorded;
f) all modifications and repairs applied to the aircraft have been recorded and are approved;
g) all service life limited components installed on the aircraft are properly identified, recorded and have not exceeded their approved service life limit;
h) all maintenance has been released in accordance with *BMAA practices (see SIGMA Matrix below)*;
i) the aircraft complies with the latest revision of its CAA type approval or Airworthiness Approval Note, including a physical inspection of the aircraft, its equipment and any required placards and markings, and that there is no evident defect and no inconsistencies between aircraft and records;
j) weight and balance is current and valid;
k) noise certificate is current and valid, if required (certificate no longer required for Microlight aircraft);
l) any required evaluation flight has been completed as follows:

i) in the case of initial issue of the Permit to Fly, in accordance with BMAA procedure,

or

ii) when required by a check flight has been satisfactorily completed, the results recorded in the Check Flight Schedule, and any necessary action taken.

[2] CAA CAP 553 BCAR Section A - Airworthiness Procedures where the CAA has Primary Responsibility for Type Approval of the Product, section A3-7 Permits to Fly Aircraft - Initial and Continuing Airworthiness

1.6 Airworthiness of BMAA Permit to Fly aircraft – *purely an owner responsibility*

The owner/operator is legally responsible for ensuring that their aircraft is correctly maintained and in an airworthy condition for flight – **not** the BMAA inspector, maintenance organisation or the BMAA. Note this is usually the first legal condition of the Permit to Fly, followed by the second that the aircraft must be operated with respect to manufacturer limitations. If this is not done correctly, the Permit to Fly is invalidated. This does not mean that the owner/operator has to do all the work themselves, but they are legally responsible for ensuring that the work is done to a satisfactory standard.

Owner/operators should be aware of the difference between Permit to Fly aircraft and Certificate of Airworthiness aircraft. The approval process for Permit to Fly aircraft concentrates on assuring that the aircraft is fundamentally safe when in good condition. Therefore, regular and thorough inspection and conscientious maintenance are vital parts of safely operating a Permit to Fly aircraft.

BMAA draws owner/operators to the attention of CAA CAP 553 BCAR Section A - Airworthiness Procedures where the CAA has Primary Responsibility for Type Approval of the Product, section A3-7 Permits to Fly Aircraft - Initial and Continuing Airworthiness:

> *"13.1 - **The owner/operator is responsible for the continuing airworthiness of an aircraft and shall ensure that no flight takes place unless**:*
>
> ***a)** the aircraft is maintained in an airworthy condition; and*
> ***b)** any operational and emergency equipment fitted is correctly installed and serviceable or clearly identified as unserviceable; and*
> ***c)** the Permit to Fly and Certificate of Validity remains valid; and*
> ***d)** the maintenance of the aircraft is performed in accordance with the maintenance programme."*

1.7 Responsibilities of the Pilot in command of a BMAA Permit to Fly aircraft

Although the owner/operator is responsible for maintaining the aircraft in an airworthy condition, any aircraft commander (operating as P1) is responsible for ensuring that the flight is legal. Note this includes minimum third-party insurance cover, as a flight is being made. CAA G-INFO database offers advice on what is considered to be the minimum amount of cover for any aircraft registered. Note certain aerodromes may require additional cover.

When it comes to flying the aircraft, both the owner/operator and 'pilot in command' (if a different person) have a duty of care to any passengers taken, other airspace users and the general public.

BMAA draws pilots to the attention of CAA CAP 553 BCAR Section A - Airworthiness Procedures where the CAA has Primary Responsibility for Type Approval of the Product, section A3-7 Permits to Fly Aircraft - Initial and Continuing Airworthiness:

> *"13.3 -* ***The pilot-in-command shall be responsible for the satisfactory accomplishment of the pre-flight inspection. This inspection must be carried out by the pilot or another qualified person, but need not be carried out by an approved maintenance organisation****."*

1.8 Inspection for Permit to Fly revalidation (issuance of a Certificate of Validity)

Regarding inspections by a BMAA Inspector for revalidation of the Permit to Fly, please note the following:

- The owner/operator is responsible for making all arrangements.
- Is not a 'complete' inspection; only parts that are readily accessible are inspected.
- Reflects the condition of the aircraft at the time of the inspection, it in no way guarantees that the aircraft will remain airworthy for the whole year. Remember the owner operator is responsible for the continued airworthiness of the aircraft (see section 1.1)

2.0 Approved Microlight Data & Documentation

2.1 Pilot Operating Handbook (POH)

The approved data for operating a BMAA aircraft is found in the aircraft's Pilot Operating Handbook.
This document can be known by other terms such as Pilot Operators Handbook, Pilot Manual or Flight Manual. For simplicity, sometimes, the POH & AMM are amalgamated.

The Pilot Operating Handbook describes the aircraft systems, operating techniques, procedures (i.e. emergency) and limitations to ensure safe and legal operation of the aircraft. The POH is listed in the Aircraft Datasheet (see section 2.4 below) and should be available via contacting the manufacturer/importer or looking at their website.

The owner must be familiar with the document and must make it available to any pilot intending to fly the aircraft. As listed in 1.5 above, the owner/operator is responsible for checking for updates and new document versions.

2.2 Aircraft Maintenance Manual (AMM)

The approved data for maintaining an aircraft in an airworthy condition is the Aircraft's Maintenance Manual (AMM). The AMM describes the mandatory airframe checks required to maintain the aircraft in an airworthy condition and, when necessary ancillary systems such as the engine or propeller. In most cases, for ancillary components, the AMM will recommend following the ancillary component supplier instructions. I.e., for Rotax powered Microlights, the aircraft manufacturer usually recommends following the Rotax schedule.

The manufacturer checks generally combine inspection and maintenance actions.

The owner must be familiar with the document and must make it available to any pilot intending to fly the aircraft. Like the POH, the owner/operator is responsible for checking for updates and new document versions.

2.2.1 Scheduled Checks

Scheduled manufacture checks will normally range from the pre-flight inspection to major strip and rebuilds.

Checks are composed of lists of actions that include:

- Pure inspection actions.
- Inspection actions require the aircraft to be (at least partially) disassembled to inspect components satisfactorily.
- Pure maintenance actions. Such as lubrication, inspection and cleaning.
- Replacement of 'lifed' items. Usually, these are replaced, irrespective of their visual condition with new at the specified interval.

Components that are no longer serviceable must be replaced. Please see the BMAA's replacement parts policy described in TIL058 Replacement Parts. Repair approval may be required if replacement involves a manufacturing process – as opposed to simply bolting on a replacement (see section 6.4). Approval must be sought before starting the repair.

2.2.2 Required Actions

A Condition associated with the Permit to Fly requires that "the aircraft shall be operated in accordance […] with the manufacturers' instructions for the type and model of aircraft". Therefore, mandated actions required by the aircraft's maintenance manual – as opposed to optional or advisory actions – must be performed, or the Permit to Fly is invalidated.

2.3 Illustrated Parts Catalogue (IPC)

These are becoming more common and are incredibly helpful for all parties concerned. They typically feature detailed exploded diagrams of all aircraft assemblies, part numbers, quantities and sometimes component or consumables specifications.

2.4 Aircraft Datasheets (TADS & HADS)

Same as Permit to Fly Certificates, three flavours:

- Type-approved (factory-built);
- Type-accepted (amateur-built);
- Type accepted (factory-built).

They contain generic data about each aircraft type such as; the body responsible for continued airworthiness, the Manufacturer/Importer details, certification basis (Section S, etc), MTOW, wing loading, Maximum Zero Fuel Weight, loading limitations (occupants, baggage, fuel capacity etc), approved engine and propeller configurations, engine limitations (note these are specified by the airframe manufacturer as opposed to the engine supplier), speed limitations (stall, VFE, VA, VNE, etc[3]), permitted manoeuvres (angles of bank, etc), mandated instruments and their ranges must be fitted and operational for the aircraft to be considered airworthy, control deflections (should include primary and secondary, plus tolerances), POH & AMM (plus any other applicable documents), mandatory placards, MPDs, SBs, ADs, aircraft performance (T/O, landing, climb and glide), 3-view diagram with measurements, mandatory & optional modifications, weight & balance (datum measurements) and finally any points of special attention.

This is the primary document used by BMAA inspectors during the BMAA airworthiness audit inspection to revalidate the Permit to Fly (by raising a Certificate of Validity). If you spot any errors in any TADS/HADS, please contact the **BMAA Technical Office** https://www.bmaa.org/information-library/contact-us

2.5 Airworthiness Approval Note (AAN) & Microlight Aircraft Approval Note (MAAN)

Similar to TADS/HADS; however, AAN's (issued by either CAA or BMAA) and MAAN's (BMAA only) tend to relate to specific approvals (modifications or repairs), sometimes for an individual aircraft. For example, each BMAA amateur-built aircraft has a specific MAAN to approve its original construction. The document details all aspects of the aircraft and its initial build state. During the BMAA audit airworthiness inspection, BMAA inspectors use this document to check that the aircraft conforms at least to that basic state (or that another approval has been raised). Remember, the airframe must always be in an approved state, which is the owner/s legal responsibility to ensure this.

If you require a copy of the MAAN document for your aircraft simply log in to the BMAA website member area.

[3] For advice on speeds please see BMAA TIL075 Limiting Speeds, ASI Calibration & Markings

3. Mandatory Permit Directives (MPDs), Service Bulletins (SBs), & Airworthiness Directives (ADs)

3.1 Mandatory Permit Directives (MPDs)

Mandatory Permit Directives (more commonly written as 'MPD') are issued by the CAA[4]. CAP 661: Mandatory Permit Directives; contained all issued MPDs up until 31 January 2012, when the publication ceased to be amended. The MPDs in CAP 661 remain valid and are not 'withdrawn'. All MPDs realised after 31st January 2012 are available directly on the CAA website:

http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=list&type=sercat&id=55

3.2 Service Bulletins (SBs)

Service Bulletins (more commonly written as 'SB') are normally issued to remedy a defect in the type's design/construction. Service Bulletins tend to be issued by the body responsible for the type's continued airworthiness (see section 5). Service Bulletins commonly describe a special inspection and/or modification to be performed and may require the involvement of a BMAA Inspector.

3.3 Airworthiness Directives (ADs)

Airworthiness Directives (more commonly written as 'AD' are issued by certain authorities such as European Union Aviation Safety Agency EASA[5].

https://www.easa.europa.eu/the-agency/faqs/airworthiness-directives-ads

Although they can be issued in isolation, they are generally used to mandate the incorporation of a Service Bulletin. EASA ADs only relate to certified airframes and components. When a certified component is fitted to an aircraft with a UK Permit to Fly, the certification status becomes void. However, for flight safety purposes, the AD actions must be observed in the same manner as that of a UK CAA Mandatory Permit Directive.

[4] All MPDs are available on the CAA website. All but the latest MPDs are archived in CAP 661. Search www.caa.co.uk for "MPD" and "CAP 661".
[5] All ADs are available on the EASA website https://www.easa.europa.eu/the-agency/faqs/airworthiness-directives-ads.

4. Bodies responsible for continued airworthiness

Continued airworthiness activities include collecting and analysing accident, incident, and defect reports from owners/operators to take appropriate action if these reports highlight a defect in the design/construction of the type (or other recurring problem). There is a 'body' responsible for the type's continued airworthiness for each type in the BMAA fleet. This body is either the manufacturer or the BMAA.

4.1 Type-approved (factory-built) aircraft

Factory-built types are supported by the type-approval holder (CAA approved manufacturer), responsible for continued airworthiness. Therefore, defects must be reported to the type-approval holder (and ideally also to the BMAA). The type-approval holder issues service Bulletins for these types.

Note: contrary to popular belief, aside from revalidating the Permit to Fly, the BMAA is not formally responsible for the continued airworthiness of a supported, type-approved aircraft. The BMAA is happy to receive reports on type-approved aircraft to advise the type-approval holder. If appropriate, we will also inform the BMAA Inspectorate.

4.2 Type-accepted (BMAA Amateur-built) aircraft

The BMAA is formally responsible for the continued airworthiness of amateur-built types. However, in practice it shares its responsibility with the UK distributor (whether that be the kit importer or designer/manufacturer). Therefore, defects with these aircraft must be reported to the BMAA, copying the UK distributor for their information and advice. The BMAA issues service Bulletins for these types.

4.3 Orphan aircraft

Orphan types are those where the type-approval holder no longer exists. In most cases the continued airworthiness responsibility of orphan types is usually derogated by the CAA to the BMAA. Therefore, all defects with these aircraft should be reported to the BMAA.

Where that has not happened, CAA remain responsible.

5. Activities requiring BMAA involvement

5.1 Certificate of Validity (revalidating the Permit to Fly Certificate)

To be valid, a Permit to Fly requires a Certificate of Validity. A Certificate of Validity is valid for up to 12 months. An example Certificate of Validity is shown in figure 2.

Certificates of Validity are issued by the BMAA on application from the owner, following a satisfactory inspection (by a BMAA Inspector) and check flight. The process is described in on the BMAA website:

https://www.bmaa.org/information-library/aircraft-technical-information/renewing-your-permit-to-fly

The inspection includes a review of the aircraft's paperwork and an inspection of the airframe. One of the paperwork checks is to confirm that all required maintenance actions have been performed (see section 2.2).

BRITISH MICROLIGHT AIRCRAFT ASSOCIATION

PERMIT TO FLY- CERTIFICATE OF VALIDITY

National Permit Validity Reference: G-C[redacted]DAI/8909/84/[redacted]

Pursuant to the Article 41(4) of the Air Navigation Order 2016 of the United Kingdom and the British Microlight Aircraft Association Ltd. Technical Procedure Manual, as approved by the CAA, the

British Microlight Aircraft Association Ltd
The Bullring
Deddington
Banbury
Oxford
OX15 0TT

Approval Reference: DAI/8909/84

certifies that in respect of the following aircraft:

Aircraft Manufacturer: ASCENT INDUSTRIES LTD

Manufacturer's Designation: EUROFOX [redacted]

Aircraft Registration: G-C[redacted]

Aircraft Serial Number: [redacted]

an airworthiness review has been satisfactorily completed.

Date of Issue 17/02/2022 Date of Expiry 10/02/2023

Signed [redacted] Name [redacted]

BMAA Permit Validity August 2016

Figure 2: a Certificate of Validity for the Permit to Fly section 1.3 above.

5.2 BMAA Amateur-built aircraft construction

To qualify for a Permit to Fly, BMAA amateur-built aircraft types must be constructed under the supervision of the BMAA. In particular, construction is inspected at key stages by a BMAA Inspector. The process is described in TIL039 Amateur Build Kits - Process Guide.

5.3 Aircraft weight & balance

Weighings must be performed (or witnessed) by a BMAA Inspector. See TIL012 Weight, Balance & Weighing. The embodiment of modifications, repairs and certain maintenance activities (such as engine replacement) may also require a reweighing. Contact the BMAA Technical Office for guidance.

5.4 Modifications and repairs to aircraft

A Permit to Fly is issued, and revalidated, subject to both the design and construction being approved. Therefore, apart from certain exceptions, all modifications and repairs to BMAA aircraft require approval. The process of applying to the BMAA for approval is described in TIL002 Modifications.

TIL001 Repairs describes which repairs require explicit approval and which do not and the process of applying to the BMAA for approval. Specific guidance on particular types of modification and repair is to be found on the BMAA website.

5.5 Hired aircraft

Type-approved (factory-built) & amateur-built microlights can be hired out by flying clubs to club members. Previously aircraft required an individual CAA Exemption, but a generic exemption was issued in April 2016. There are also additional operational and maintenance requirements. See TIL032 BMAA Code of Practice for Microlight Hire.

5.6 Sign-off requirements – BMAA SIGNATORY MATRIX

BMAA takes a holistic approach to the continued airworthiness of all the aircraft within its fleet.

Sign-off requirements depend upon on the activity undertaken, the following Matrix must be used for BMAA aircraft.

The following is a summary of the rules for first and second inspections and the signing of specific forms.

	Approved Activity	Required Signatures				Notes
		Owner / Trustee	Qualified Person(s)1	BMAA Inspector	Manu-facturer[3]	
FORMS	Annual Validation of Permit to Fly [AW001]	■				**One signature:** This declaration must be made by the registered owner or a registered part owner of the aircraft.
	Flight Release Certificate [AW003] Inspection Worksheets [AW005, AW006 or AW007]			■		**One inspection:** BMAA Inspector may not sign for their own aircraft unless specifically authorised by the BMAA. Inspectors will never be authorised to sign for an aircraft which they own and are hiring out.
	Amateur Built Aircraft Project [Form AW022]	■		■		**Two inspections[2]:** Second inspection must be done by BMAA Inspector who is not the Builder.
	Lifting of a Suspension of a Certificate of Validity for a Permit to Fly or Certificate of Clearance for Test Flight Purposes using Form [AW026]			■		**One inspection:** The certificate of validity/clearance ceases to be suspended only after the form has been signed and the inspection/check flight recorded in the aircraft logbook.
	Weight & Balance measurement [Form AW028 Excel Spreadsheet]			■	■[3]	**One inspection:** BMAA Inspector should be in attendance at weighing. For an initial Permit to Fly application, a person appropriately authorised by the Manufacturer may sign this report.
	Certificate of Clearance for Flight for Test Purposes [AW029]	■		■		**Two signatures:** This declaration must be made by the registered owner or a registered part owner of the aircraft, the authorised BMAA Inspector and the project Test Pilot.
	Aircraft Change of Data Sheet CDS [AW030]			■		**One inspection:** BMAA Inspector only, signing in accordance with the data present on G-INFO.
MODS & REPAIRS	STANDARD Minor Modifications [TIL 101 etc.]	■		■		**Two inspections:** BMAA Inspector may sign off his own work.
	MINOR Modifications/Minor Repairs [Form AW002a/b & AW004]	■		■		**Two inspections:** BMAA Inspector may sign off their own work. The application must be received before approval can be sought.
	MAJOR Modifications & Repairs [AW002a/b / MAAN / AAN]	■		■		**Two inspections[2]:** Second inspection must be done by BMAA Inspector who is not the Modifier/Repairer.
	Manufacturer[4] Optional Approved Modifications [TADS Annex B]	■		■*		**Two inspections:** Inspection of Optional Approved Modifications listed in TADS/HADS Annex B should be done by a BMAA Inspector unless the *Manufacturer[4] says otherwise. Naturally Manufacturers can sign these as well.
SB / MPD / AD	Service Bulletins & Repairs [SB's, MPD's & AD's]	**SIGNED IAW THE SB / MPD / AD REQUIREMENTS**				These items must be actioned and sign-off in accordance with the instructions contained within. This could be any or a combination of all the possible sign-off combinations above.

	Approved Activity	Required Signatures				Notes
		Owner / Trustee	Qualified Person(s)1	BMAA Inspector	Manu-facturer[4]	
MAINTENANCE	Maintenance Review of Hired Microlights [TIL032]	■		■		**Two signatures:** The person completing the work & BMAA Inspector satisfies themselves that the correct inspection checks & maintenance actions specified in schedule have been recorded in the relevant logbooks.
	Dis/Reassembly of Primary Structure, not De/Rerigging	■	■		*	**Two inspections[5]:** Duplicate inspection must be by a Person who is not the Assembler. *Manufacturers may perform both activities.
	Maintenance by Replacement[6] of Primary Structures [AMM/EMM/IPC[7]]	■	■		*	**Two inspections[5]:** Duplicate inspection must be by a Person who is not the Assembler. *Manufacturers may perform both activities.
	Maintenance by Replacement[6] of Control Systems [AMM/EMM/IPC[7]]	■	■		*	**Two inspections[5]:** Duplicate inspection must be by a Person who is not the Assembler. *Manufacturers may perform both activities.
	Maintenance by Replacement[6] of all else [AMM/EMM/IPC[7]]	■[8]			*	**One inspection:** Only a logbook entry is required by the Maintainer[8]. *Manufacturers may perform both activities.

KEY

1. 'Qualified Person' is someone the Owner considers to have sufficient knowledge and experience to inspect work done against a published requirement.

2. The first inspection may be by the person who did the work, the second inspection must be made by a BMAA Inspector who did no work.

3. For an initial Permit to Fly application, a person appropriately authorised by the Manufacturer may sign this report.

4. 'Manufacturer' is the Type Approval Holder of the aircraft with a current CAA A8-1/A8-21 approval. The BMAA is the Type Approval Holder for orphaned types.

5. The first inspection is by the person who did the work, then a second inspection is performed by an independent person who did no work.

6. 'Maintenance by Replacement' means replacement of components with fully interchangeable parts approved by the manufacturer satisfying 'form, fit and function'.

7. AMM = Aircraft Maintenance Manual, EMM = Engine Maintenance Manual, POH = Pilot's Operating Handbook, MPD = Mandatory Permit Directive, MAAN = Microlight Airworthiness Approval Note, IPC = Illustrated Parts Catalogue, TIL = Technical Information Leaflet

8. The BMAA always recommends a second inspection, even of non-safety critical structure, it is a wise habit to develop.

5.6 BMAA Inspectorate

Please note that the BMAA Inspectorate is deliberately limited to the following activities:

- Inspection for Revalidation of Certificate of Validity for Permit to Fly.
- Amateur built aircraft projects.
- Inspection of BMAA approved modifications.
- Inspection of BMAA approved repairs.
- Weight and balance.
- Inspection of maintenance records of hired Microlights - TIL032.
- Service Bulletins (SB) & Mandatory Permit Directives (MPD) where required.

Unless explicitly granted by the BMAA Tech Office, these are the only activities for which BMAA inspectors are acting on behalf of the BMAA and may use their inspector number.

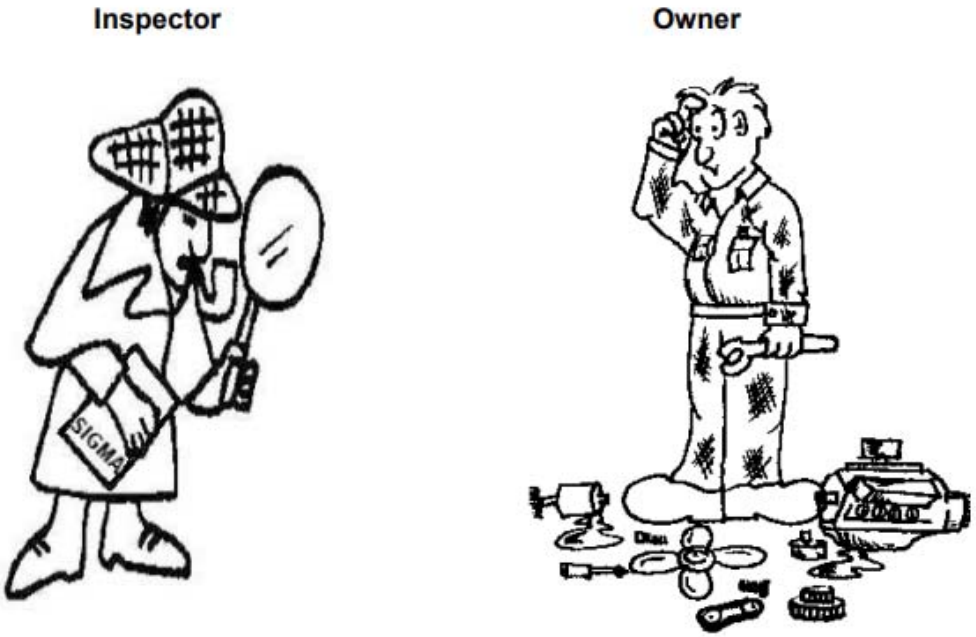
The scope of the of the inspector's job is simply to inspect.

- To find the defect – *not to fix it*
- To monitor the amateur build – *not to build it*
- To examine the repair – *not to repair it*
- To look at the modification – *not to modify it*
- To verify the documentation – *not to rewrite it*
- To ensure compliance against BMAA standards – *not against his own*
- To act on behalf of and under the control of the BMAA – *not the Owner*

The inspector's findings are the basis on which they can, afterwards, offer advice and guidance to help the owner keep their aircraft airworthy.

So, the guiding rule is:

The Inspector finds the defects and the Owner (or their contractor) fixes the defects.



Of course, someone who happens to be a BMAA Inspector may work, directly assist, or even be employed by an owner. However, they sign for the work as a 'Qualified Person', not that of a BMAA Inspector using their authorisation number.

If you require any clarification on this subject, please consult TIL044 SIGMA - Standard Inspection Guidelines for Microlight Aircraft or please contact the **BMAA Technical Office** https://www.bmaa.org/information-library/contact-us

6. Maintenance of BMAA Aircraft

As previously mentioned, the key tool for maintaining an aircraft in an airworthy condition is the aircraft's Maintenance Manual (AMM), which might be combined with the POH. The AMM describes the Checks required to maintain the aircraft in airworthy condition. The Checks generally combine inspection and maintenance actions.

We have also established the owner is responsible for either conducting the maintenance themselves or arranging for a suitable person or organisation to do it on their behalf.
Finally, post-maintenance, the aircraft must be released back to service.

6.1 Conducting Maintenance & BMAA "Pilot Maintenance"

The Air Navigation Order used to define 'Pilot Maintenance'. This is a term derived from the certified aviation world (Certificate of Airworthiness). It is essentially maintenance that the pilot/owner is allowed to perform without direct oversight of a Licenced Engineer.

For BMAA Permit to Fly aircraft, BMAA considers all activities to be 'pilot maintenance' unless declared otherwise by the approved POH/AMM, i.e. by the type-approval holder.

The Aircraft Maintenance Manual (AMM) will clearly state if specialist qualifications or equipment are required for specific maintenance tasks.

An excellent example of this would be pressure checking of OLEO struts (shock absorbers). These usually operate at very high pressures (hundreds of PSI) and tend to be filled with Nitrogen (to prevent corrosion). Without the correct knowledge and equipment, disturbance of these units would likely cause an accident.

Another example would be removing or disassembling the rocket in a Ballistic Recovery System (BRS) or Airframe Mounted Total Parachute Recovery System (AMTPRS). Technically, ballistics should be stored in approved containers, which usually have to be inspected by local Police. BMAA highly recommends only using equipment importers who have the correct working knowledge, equipment and facilities to deal with such items.

6.2 Recording Maintenance & Release back to Service

BMAA uses the definition as contained in CAA CAP 553 BCAR Section A - Airworthiness Procedures where the CAA has Primary Responsibility for Type Approval of the Product, section A3-7 Permits to Fly Aircraft - Initial and Continuing Airworthiness:

> *"13.2 -* ***Any person or organisation performing maintenance shall be responsible for the tasks performed."***

When maintenance actions are recorded in the airframe and engine logbook, the entry must also contain details of what the work has been carried out against.

For example, if carrying out a 100hr service on a C42, the logbook entry should reference the manufacturer's maintenance data. Usually, this is the most current version of the maintenance manual, so in the case of the C42 it would be C42-Series_Issue_VII_18.02.2014

An example entry would be as follows:

DD/MM/YYYY	100hr service carried out IAW C42-Series_Issue_VII_18.02.2014, see worksheet 1.0/YYYY	NAME* SIGNATURE* & DATE

**If the activity disturbs major structures, then a duplicate inspection by a Qualified person MUST also be carried out, including counter signature in the logbook.*

BMAA guidance on choosing a 'Qualified Person' would be (but not limited too):

- A fellow pilot (especially if they fly the same type of aircraft)
    - Someone with a current or lapsed pilot licence.
- Someone who builds or maintains aircraft.
- Flight instructor/examiner.
- BMAA/LAA/BGA inspector.
- EASA/FAA/CAA licenced engineer.
- Aircraft manufacturer / importer / maintainer.
- Engine manufacturer / importer / maintainer.
- Propeller manufacturer / importer / maintainer.
- Avionics manufacturer / importer / maintainer.

Where maintenance actions are considerable it is advisable to make use of Worksheets and reference then in the logbook. BMAA worksheet template can be used here: AW 068 Issue 1 Aircraft Worksheet

Any worksheets raised or referenced in the logbook form a fundamental part of the aircraft records, so they must be kept for future viewing by BMAA/CAA and also be passed on to new owners if the aircraft is sold. Any aircraft, engine or propeller logbook is considered to be a legal document. To deface, damage, destroy or make false entries constitutes a criminal offence.

6.3 "Pilot Maintenance Release (PMR)"

BMAA aircraft do not use the traditional Pilot Maintenance Release system, but instead utilise a more comprehensive and bespoke system.

The holistic BMAA Airworthiness System stems from a fundamental AAIB safety recommendation made back in 2005 by D S Miller, Deputy Chief Inspector of Air Accidents, Air Accidents Investigation Branch, Department for Transport to the Civil Aviation Authority.

"It is recommended that the British Microlight Aircraft Association review and regularly update their document entitled 'Guidelines for the Inspection and Maintenance of Microlight Aircraft".

This was as a result of the G-STYX accident in 2004.

BMAA's holistic approach works because it is a 'complete system'. Each element complements and supports other sections. Remove or change a part, and the system does not function as intended. BMAA appreciates it is fortunate to possess all the necessary elements (ref page 3 BMAA Airworthiness System diagram and the 5.6 Signatory Matrix), which is why our bespoke arrangement works for BMAA specific circumstances. Other organisations are not in the same position, so they may have to rely on the PMR method until they are in the same position.

The BMAA Airworthiness System is of at least an equivalent level of safety, if not greater (based on performance) and it is certainly more efficient due to greater levels of autonomy and use of the wider (and experienced) aviation community, both in the UK and abroad (not easily achieved with a traditional PMR).

6.4 Second Inspections and Qualified Persons

Safety-critical maintenance tasks – where a mistake could create a significant hazard – require a Second Inspection by a Qualified Person. These requirements are described in TIL065 Second Inspections and Qualified Persons.

A Qualified Person is someone independent, who did not carry out the work, that the Owner chooses to inspect and check the work is satisfactory.

'Qualified Person' is someone the Owner considers to have sufficient knowledge and experience to inspect work done against a published requirement.

BMAA always recommends a second or even third inspection regardless of how critical the disturbed item is. This is a good practice and general common sense!

7. Microlight Engines

BMAA aircraft are not required to use certified engines. Therefore, unless the Aircraft Maintenance Manual states otherwise, the BMAA considers that if the engine manufacturer's required maintenance is not followed, this does not invalidate the Permit to Fly. However, if the engine manufacturer's advice is not followed, the user must fully accept that there may be an increased risk of engine failure.

7.1 MOGAS (Motor Vehicle Gasoline)

CAA INFORMATION NOTICE Number: IN–2012/179 states that the ***"the composition and properties of some Mogas fuels has changed and it is becoming increasingly difficult to obtain Mogas that does not contain any alcohol. With the exception of microlights, the use of Mogas containing alcohol is generally prohibited in aircraft"***.

7.2 E10 (MOGAS with 10% ethanol)

As of September 2021, E10 (MOGAS with 10% ethanol) was introduced to the UK. This affects engines and airframes differently. Rotax has stated since 2014 that the 912 series can use a maximum of 10% ethanol in the following service instruction SI-912 i-001R3 / SI-912-016R8 / SI-914-019R8:

> *"5.1.1) In addition to AVGAS and unleaded automotive fuel (Mogas) the ROTAX® 912/914 Series of engines are now approved for use with E10. Fuels that contain more than 10% ethanol blend have not been tested by BRP-Powertrain and are not permitted for use"*

Note that Rotax only permits; EN 228 Normal for the 912UL (80hp), the minimum grade for the higher-powered (and higher compression) 912ULS & 912iS being EN 228 Super or above. These engines require higher Octane to reduce the risk of pre-ignition.

Responsibility for the rest of the fuel system lies with the aircraft manufacturer and or importer. BMAA wrote to all current companies, but no clear confirmations about the use of E10 have been received. BMAA has already received some reports from owners experiencing problems with fuel tubing, some of which are approved brands from CAA approved manufacturers. The issue appears to be that the outer sheathing of the fuel hose is not resistant to ethanol as opposed to the core. Degradation of the hose can be rapid, so BMAA recommends frequent checks and inspections. BMAA has also seen issues with composite or laminated tanks, in particular the Shadow Fiberlam ones; please see our bulletin here - 2336 Shadow Fuel Tank deterioration

7.3 AVGAS UL91

BMAA advises against the use of ethanol where possible. Arguably the best fuel to use is UL91. Note the “91” does not refer to the Octane rating.

See this information leaflet from the CAA for more details:

CAA INFORMATION NOTICE IN-2012/179 - Introduction of Generic Concession No.7 facilitating the use of Unleaded Aviation Gasoline (Avgas) UL 91