

STANDARD MINOR MODIFICATION
FUEL PRESSURE GAUGE

Introduction

A fuel pressure gauge measures the fuel pressure being supplied to the engine. This can provide early warning – before engine damage or failure occurs – of a problem with the fuel system. Some engine suppliers require fitment of a fuel pressure gauge as a condition of warranty for new engines.

Fuel pressure gauges may be mechanical or electrical. A mechanical gauge takes a tapping from the fuel supply line feeding the engine; fuel hose then runs to the gauge in the cockpit. An electrical gauge has a pressure transducer tapped into the fuel supply line, which then has an electrical connection to the gauge in the cockpit.

Essential Requirements

1. Instrument location

The fuel pressure gauge must be fitted securely in the instrument panel. Any alternative position must be confirmed as acceptable – in writing – by the BMAA Technical Office.

2. Fuel hose

Fuel hose must meet all of the normal requirements for flexible fuel lines, and be suitable for the type and pressure of fuel used. This includes being resistant to ethanol if MOGAS is used.

Fuel hose used in the engine bay (or close to the engine in an open installation) must be fire-resistant. Unfortunately you cannot assume that hose provided with a fuel pressure gauge kit is necessarily fire-resistant.

To be sure fuel hose is fire-resistant it must be one of the following:

- Identical to the original, approved, fuel hose in the engine bay;
- Sold as 'fire-resistant' by a UK Microlight supplier or UK Microlight engine supplier;
- Covered with a fireproof sleeve (although this makes regular inspection of the hose difficult);
- Confirmed as acceptable – in writing – by the BMAA Technical office.

3. Fuel line fittings

All fuel line fittings must be metal (plastic fittings are unreliable – prone to cracking with age – as well as not being fire-resistant).

If the supplied fuel pressure transducer (electrical fuel pressure gauge systems) is not metal its location and/or fire protection must be confirmed as acceptable – in writing – by the BMAA Technical office.

All hose connections must be secured using suitable, metal clips.

4. Fuel line restriction

The fuel line to the fuel pressure gauge (or to a transducer remote from the primary fuel line) must have a restriction close to where it leaves the primary fuel line. This is to prevent the loss of excessive fuel should there be a failure in the line or at the gauge. This restriction is normally built into the T-piece inserted into the primary fuel line.

5. Electrical wiring

If an electrical fuel pressure gauge is fitted, the wiring supplying power to the gauge must be protected by a suitable fuse or circuit breaker.

Normally the power supply to an electrical fuel pressure gauge will be switched by the aircraft's existing Master Switch. However, if a dedicated switch is fitted it must be placarded with its sense and function,

STANDARD MINOR MODIFICATION
FUEL PRESSURE GAUGE

and be oriented down for off. (Note: electrical equipment must be able to be isolated from its power supply by the pilot in flight while leaving the engine running.)

6. Firewall

If the fuel line to the fuel pressure gauge passes through the firewall, the opening in the firewall must be sealed with close fitting, fire-resistant grommets, bushings, or firewall fittings. Alternatively, any gaps (or non fire-resistant fittings) may be sealed with aluminium tape, or fire-resistant (or 'intumescent') sealant.

7. Instrument markings

If a fuel pressure gauge is a required instrument for the aircraft type (according to the TADS / HADS) the minimum and maximum acceptable fuel pressure must be marked: by red radial lines on a conventional, analogue instrument. If a fuel pressure gauge is not an absolute requirement for the aircraft type this marking is only recommended.

Returning the Form

After fitting the gauge, and having the modification inspected by a BMAA Inspector, the form must be sent to the BMAA Technical Office for approval. It is acceptable to send in the form with your Permit revalidation form.

Aircraft must be wholly owned by BMAA members. A BMAA Ownership Trustee Grid should be submitted with this form for syndicate, group and company owned aircraft.

Prepared by:



Adrian Jones
Design Approval Engineer
British Microlight Aircraft Association

Approved for Issue:



B J Syson
Chief Technical Officer
British Microlight Aircraft Association

BRITISH MICROLIGHT AIRCRAFT ASSOCIATION

TECHNICAL INFORMATION LEAFLET

NO: 116

ISSUE 1

SEPTEMBER 2013

**STANDARD MINOR MODIFICATION
FUEL PRESSURE GAUGE**

CHECKLIST

Reg: G- _____	Aircraft type:	Serial No:
Owners name ¹ :		Owners BMAA No:
¹ BMAA Aircraft Ownership Trustee Grid required for syndicate/group/company owned aircraft		

Installation Details

Fuel pressure gauge Make and Model:

Safety Checks

No.	ACTION	OWNER'S INITIALS	INSPECTOR'S INITIALS
1 Pre-installation checks			
1.1	Ensure that the pressure gauge kit is of suitable quality and in a satisfactory condition.		
1.2	Ensure latest issue of fitting instructions present.		
1.3	Ensure that fuel hose satisfies <i>Essential Requirement 2</i> and fittings satisfy <i>Essential Requirement 3</i> .		
2 Installation			
2.1	Confirm fuel pressure gauge location satisfies <i>Essential Requirement 1</i> , and ensure that gauge secure and visible.		
2.2	Confirm system fitted in full accordance with manufacturer's fitting instructions.		
2.3	Fuel line restriction: ensure <i>Essential Requirement 4</i> is satisfied.		
2.4	Ensure plumbing satisfactorily routed, secured and protected against abrasion, taking into account heat sources (e.g. exhaust), propeller clearance, relative movement between parts in operation, cowlings etc.		
2.5	Confirm all hoses secure.		
2.6	Ensure wiring satisfactorily routed, secured and protected against abrasion. Ensure <i>Essential Requirement 5</i> is satisfied.		
2.7	Firewall: ensure <i>Essential Requirement 6</i> is satisfied.		
2.8	Instrument marking: ensure <i>Essential Requirement 7</i> is satisfied.		
2.9	Confirm no holes or cuts made in primary structure.		
2.10	Confirm modification implemented to a satisfactory standard and in accordance with normal aviation practice.		

PTO

BRITISH MICROLIGHT AIRCRAFT ASSOCIATION

TECHNICAL INFORMATION LEAFLET

NO: 116

ISSUE 1

SEPTEMBER 2013

**STANDARD MINOR MODIFICATION
FUEL PRESSURE GAUGE**

No.	ACTION	OWNER'S INITIALS	INSPECTOR'S INITIALS
3 Ground running			
3.1	Ground run to ensure operation of fuel pressure gauge and engine satisfactory.		
3.2	After run ensure hose clips secure and no leaks are present.		
4 Documentation			
4.1	Following documents to be kept with aircraft records: <ul style="list-style-type: none"> o Manufacturer's fitting instructions; o Invoices for all parts; o Correspondence with BMAA Technical Office. 		
4.2	Modification recorded in airframe logbook.		
4.3	Weight and balance report amended; modified aircraft continues to comply with the weight and balance requirements of the TADS / HADS.		

OWNER'S DECLARATION		
I declare that the foregoing information is correct, and I will not change the installation design once approved.		
Signed:	Name:	Date:

INSPECTOR'S DECLARATION			
I declare that the foregoing information is correct, the <i>Essential Requirements</i> are complied with, and the installation is fit to be flown.			
Signed:	Name:	Insp No:	Date:

This form must be sent with payment as per BMAA Online Shop (www.bmaa.org), and BMAA Aircraft Ownership Trustee Grid (if applicable) to*:- technical.office@bmaa.org

Note: It is recommended that the owner carries out a shakedown flight within gliding distance of the airfield. Ensure that the flight is conducted so that in the event of a problem flight safety is not compromised.

BMAA Office Approval:	(signed)	(Name)
Mod No.: G-_____ / TIL116 / 20 __ / _____		(Date)

**Whilst waiting for this form to be returned by the BMAA the aircraft may be flown for upto one calendar month from the Inspection date above. Once this form is returned to you signed please enter the full modification approval number above in your aircraft logbook and retain this sheet with your aircraft records.*