TYPE: Shadow Series B

(1) MANUFACTURER CFM Aircraft Ltd (ceased trading)
BMAA is responsible for continued airworthiness

(2) UK IMPORTER None

(3) CERTIFICATION BCAR Section S Advance Issue dated March 1983.
List of Section S Blue Papers and Additional CAA Requirements

(4) DEFINITION OF BASIC STANDARD CFM Aircraft Ltd Drawing Register Shadow Series
B Schematics Section, 25 March 1985, plus CFM Mods 004, and 006

(5) COMPLIANCE WITH THE MICROLIGHT DEFINITION:

(A) MTOW 348 kg or 374 kg¹
(B) No. Seats 2
(C) Maximum Wing Loading 24.85 kg/m²
(D) Vso 33 kt IAS
(E) Permitted range of pilot weights 55 – 90 kg front seat
0 – 90 kg rear seat
(F) Typical Empty Weight (ZFW) 160 kg or 186 kg¹
(G) ZFW + 172 kg crew + 1 hr fuel 346 kg or 372 kg¹
(19 litres / 13.7 kg)
(H) ZFW + 86 kg pilot + full fuel 308 kg
(49.6 litres / 35.7 kg)
(I) Max ZFW at initial permit issue 162 kg or 188.5 kg¹

¹ If Mods CFM 26 and 35B are incorporated the MTOW is increase to 374 kg
(6) POWER PLANTS

<table>
<thead>
<tr>
<th>Designation</th>
<th>Shadow Series BD</th>
<th>Shadow Series BD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Type</td>
<td>Rotax 447 Upright</td>
<td>Rotax 447 Upright</td>
</tr>
<tr>
<td>Reduction Gear</td>
<td>2.58:1</td>
<td>2.58:1</td>
</tr>
<tr>
<td>Exhaust System</td>
<td>Rotax Modified</td>
<td>Rotax Modified</td>
</tr>
<tr>
<td>Intake System</td>
<td>Air filters</td>
<td>Rotax Airbox Muffler</td>
</tr>
<tr>
<td>Propeller Type</td>
<td>Newton 19R/P</td>
<td>Newton 19 R/P</td>
</tr>
<tr>
<td>Propeller Dia x Pitch</td>
<td>51&quot; x 44&quot;</td>
<td>51&quot; x 45&quot;</td>
</tr>
<tr>
<td>Noise Type Cert No.</td>
<td>9M</td>
<td>39M</td>
</tr>
<tr>
<td>AAN approving configuration</td>
<td>19526</td>
<td>19897</td>
</tr>
</tbody>
</table>

(7) MANDATORY LIMITATIONS:

(A) Max Take-Off Weight 348 kg or 374 kg

(B) CG Limits
   Aft limit 45" or 45.2" aft of datum
   Forward Limit 38" or 39.3" aft of datum

(C) CG datum
   24" fwd of Wing Leading Edge at Wing Root

(D) Cockpit Loadings
   Min Front 55 kg Rear 0 kg Total 55 kg
   Max 90 kg 90 kg Total 180 kg

(E) Never Exceed Speed, $V_{NE}$ 94 kt IAS

(F) Manoeuvring Speed, $V_A$ 66 kt IAS

(G) Flap Limiting Speed, $V_F$
   15° deflection 57 kt IAS
   30° deflection 52 kt IAS

(H) Permitted Manoeuvres
   Maximum bank angle 60°
   Normal acceleration limits, +4 / -2g
   Aerobatics and Spinning prohibited

(I) Fuel Contents (Max Useable) 22.7 litres
   49.6 litres if slipper tank fitted.
(J) **Power Plant**

<table>
<thead>
<tr>
<th>Engine</th>
<th>Rotax 447</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max RPM</td>
<td>6800</td>
</tr>
<tr>
<td>Max Continuous RPM</td>
<td>6000</td>
</tr>
<tr>
<td>Max CHT</td>
<td>260°C (500°F)</td>
</tr>
<tr>
<td>Max EGT</td>
<td>650°C (1200°F)</td>
</tr>
<tr>
<td>Fuel Spec</td>
<td>95 RON minimum unleaded to BS(EN)228, or AVGAS 100LL</td>
</tr>
<tr>
<td>Engine Oil Specification</td>
<td>2 Stroke</td>
</tr>
<tr>
<td>Fuel/Oil Mix</td>
<td>50:1</td>
</tr>
<tr>
<td>Fuel Pressure</td>
<td>0.2-0.4 bar at cruise power</td>
</tr>
</tbody>
</table>

(8) **INSTRUMENTS REQUIRED**

<table>
<thead>
<tr>
<th>ASI</th>
<th>Altimeter</th>
<th>RPM</th>
<th>CHT / EGT</th>
<th>Compass</th>
<th>Fuel Gauge</th>
<th>VSI</th>
<th>Slip ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Optional</td>
<td>Required</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>

(9) **CONTROL DEFLECTIONS**

- Elevator UP: 20° ± 2°
- Elevator DOWN: 16° ± 2°
- Ailerons UP: 20° ± 2°
- Ailerons DOWN: 10° ± 2°
- Rudder LEFT: 25° ± 2°
- Rudder RIGHT: 25° ± 2°
- Elevator trim tab UP: 5° *
- Elevator trim tab DOWN: 35° *
- Flaps ZERO: In line with wing centre section. 0°
- Flaps INTERMEDIATE: 15° ± 3°
- Flaps LANDING: 30° ± 3°

* The elevator trim tab deflections are shown for guidance. In practice some variation is to be expected.

(10) **PILOT’S NOTES, MAINTENANCE MANUALS, PLACARDS**

10.1 Manuals approved for use with this aircraft:

- Shadow Series B & BD Pilots Notes PN – SH/B at Amendment 6
- Shadow Series C & CD Construction Manual C/RM – CD at Amendment 1
10.2 See Annex D for details of the placards that are to be fitted.

(11) SERVICE BULLETINS, MANDATORY MODIFICATIONS

See Annex A for details. Note: MPDs may be downloaded from the CAA Website: [http://www.caa.co.uk/docs/33/cap661.pdf](http://www.caa.co.uk/docs/33/cap661.pdf)

(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT

Rate of Climb: 450 ft/min at 60 kt IAS
Stall or Minimum Flying Speed: 33 kt IAS in landing configuration
### ISSUE HISTORY

<table>
<thead>
<tr>
<th>Issue No.</th>
<th>Reason and signatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 10/05/85</td>
<td>Initial issue J G Wraith</td>
</tr>
<tr>
<td>2 26/06/86</td>
<td>J G Wraith</td>
</tr>
<tr>
<td>3 26/09/86</td>
<td>T R Woods</td>
</tr>
<tr>
<td>4 18/03/97</td>
<td>To permit an increase in maximum take-off weight to 374 kg with incorporation of Mods 026 &amp; 035B. R J Hardy</td>
</tr>
<tr>
<td>5 12/05/03</td>
<td>To include weighing information, editorial changes and the inclusion of MPD 2003-004 and BMAA SB 1681 issue 1. J Barratt</td>
</tr>
<tr>
<td>6 05/07/04</td>
<td>Change to the organisation responsible for continued airworthiness support and additional MPDs J Barratt</td>
</tr>
<tr>
<td>7 01/08/11</td>
<td>Removal of MPD 2004-002, as superseded by MPD 2004-007R1. Inclusion of all applicable MPDs, SBs and Approved Optional Mods. Correction of elevator and elevator trim tab deflections. Correction of fuel tank moment arm. Placard updates. Correction of climb rate. General data update, improved layout and 3-view drawing. A C Love</td>
</tr>
</tbody>
</table>

Signature: A C Love
ILLUSTRATION OF AIRCRAFT – 3 VIEW
### ANNEX A

**SERVICE BULLETINS AND MANDATORY MODIFICATIONS**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Classification</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM SB 2</td>
<td>Essential</td>
<td>Rotax intake muffler and propeller pitch change</td>
</tr>
<tr>
<td>CFM SB 3a</td>
<td>Recommended</td>
<td>Rotax 447 fitting of internal deflector to cooling shroud</td>
</tr>
<tr>
<td>CFM SB 4</td>
<td>Optional</td>
<td>Rotax 447 upgrade of gearbox torsional damper</td>
</tr>
<tr>
<td>CFM SB 5</td>
<td>Recommended</td>
<td>Loctite on aileron control rod ends</td>
</tr>
<tr>
<td>CFM SB 6</td>
<td>Recommended</td>
<td>Aeration of outer wings 'D' box</td>
</tr>
<tr>
<td>CFM SB 7</td>
<td>Recommended</td>
<td>Solar heating of upper wing surfaces coloured other than white</td>
</tr>
<tr>
<td>CFM SB 8</td>
<td>Optional</td>
<td>Alloy wheels</td>
</tr>
<tr>
<td>CFM SB 9</td>
<td>Recommended</td>
<td>Support for front hanger bracket</td>
</tr>
<tr>
<td>CFM SB 10</td>
<td>Recommended</td>
<td>Fore/aft wing movement</td>
</tr>
<tr>
<td>CFM SB 11</td>
<td>Recommended</td>
<td>Multi-strand elevator cable</td>
</tr>
<tr>
<td>CFM SB 12 &amp; MPD 1998-013 R2</td>
<td>Recommended, Mandatory</td>
<td>Replace/modify the rudder fin post</td>
</tr>
<tr>
<td>CFM SB 13</td>
<td>Recommended</td>
<td>Rudder pedal hinges</td>
</tr>
<tr>
<td>CFM SB 14 Issue 2 &amp; MPD 2001-002 R2</td>
<td>Mandatory</td>
<td>Cracking of tailplane spar leading edge spigot tubes</td>
</tr>
<tr>
<td>BMAA SB 1681 &amp; MPD 2003-004</td>
<td>Mandatory</td>
<td>Installation of ASI and altimeter correction placards</td>
</tr>
<tr>
<td>MPD 2004-007 R1</td>
<td>Mandatory</td>
<td>Main undercarriage replacement with approved alternative. Implement in accordance with MAAN 1762 Issue 2 or MAAN 1773 Issue 1</td>
</tr>
<tr>
<td>MPD 2004-008 R1</td>
<td>Mandatory</td>
<td>Nosewheel undercarriage. Inspect in accordance with MAAN 1762 Issue 2 Appendix A, or MAAN 1773 Issue 1 Appendix A</td>
</tr>
<tr>
<td>BMAA SB 2073</td>
<td>Recommended</td>
<td>Inspection of Part F153 Hanger Tube Bracket</td>
</tr>
<tr>
<td>BMAA SB 2329</td>
<td>Essential</td>
<td>Horizontal Tailplane Spar and Bush Wear</td>
</tr>
<tr>
<td>BMAA SB 2336</td>
<td>Essential</td>
<td>Fuel Tank Deterioration</td>
</tr>
</tbody>
</table>
ANNEX B
APPROVED OPTIONAL MODIFICATIONS

The installation of all optional modifications is to be inspected by a BMAA inspector and an entry made in the appropriate logbook(s). Involvement of the BMAA Technical Office is not required. Note that other approved modifications may exist which are not mentioned here. Contact the BMAA for details.

<table>
<thead>
<tr>
<th>Mod No.</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFM 15 / AAN 21458</td>
<td>Electrically operated elevator trim tab</td>
</tr>
<tr>
<td>CFM 18 / AAN 21555</td>
<td>Conversion of B Series to C Series</td>
</tr>
<tr>
<td>CFM 20 / AAN 21682</td>
<td>27 litre fuel tank in place of the rear occupant</td>
</tr>
<tr>
<td>CFM 26</td>
<td>Streamline struts and carry-through member.</td>
</tr>
<tr>
<td>CFM 28 / AAN 23713</td>
<td>Modification to allow aircraft to be flown without foot controls</td>
</tr>
<tr>
<td>CFM 28a / AAN 23713</td>
<td>Mechanically operated brakes replace pneumatic</td>
</tr>
<tr>
<td>CFM 29 / AAN 27392</td>
<td>Slipper tank.</td>
</tr>
<tr>
<td>MAAN 1193 Issue 5</td>
<td>Requires incorporation of mod CFM 18</td>
</tr>
<tr>
<td>CFM 31 / AAN 25545</td>
<td>Multi-strand elevator cable</td>
</tr>
<tr>
<td>CFM 32 / AAN 25545</td>
<td>Additional fuselage (shroud) window</td>
</tr>
<tr>
<td>CFM 35B</td>
<td>MTOW increase to 374 kg, requires incorporation of mod CFM 26</td>
</tr>
<tr>
<td>MAAN 1762 Issue 2</td>
<td>Crosbie replacement undercarriage and introduction of new max continuous engine rpm (installation of this modification fulfils the requirements of MPD2004-007R1)</td>
</tr>
<tr>
<td>MAAN 1773 Issue 1</td>
<td>Cook replacement undercarriage and introduction of new max continuous engine rpm (installation of this modification fulfils the requirements of MPD2004-007R1)</td>
</tr>
</tbody>
</table>

ANNEX C
WEIGHING INFORMATION

CG Datum: 24” Fwd of Wing L/E at Wing Root
Weighing attitude: Weigh at main wheels and tailskid with boom level
Mainwheel moment arm: 46.75” aft of datum
Skid moment arm: 165.75” aft of datum
Main tank moment arm: 63.5” aft of datum, capacity 22.7litres (16.3kg)
Slipper tank moment arm: 42” aft of datum, capacity 26.9 litres (19.4kg)
Pilot moment arm: 7.75” aft of datum for pilots below 75 kg
9.75” aft of datum for pilots above 75 kg
Passenger moment arm: 42” aft of datum
Crew weights: Front seat: minimum 55 kg / maximum 90 kg
Rear seat: minimum 0 kg / maximum 90 kg
Aft CG Limit: 45” aft of datum
Fwd CG Limit: 38” aft of datum
ANNEX D
EXAMPLE PLACARDS

(A) FLIGHT LIMITATIONS PLACARD AND MARKINGS

To be displayed next to the ASI.

\[ V_{NE} \text{ (Never exceed speed): } 108 \text{ mph or 94 knots IAS (to match ASI units)} \]
\[ V_A \text{ (Manoeuvring speed): } 76 \text{ mph or 66 knots IAS (to match ASI units)} \]

Alternatively the ASI may be marked with:
- A red radial line at \( V_{NE} \)
- An amber radial line at \( V_A \)
- A white arc from \( V_{S0} \) to \( V_{FE} \)

(B) ASI CORRECTION PLACARD

To be displayed next to the ASI.

\[
\begin{array}{cccccccccc}
\text{Kt IAS (ASI units)} & 30 & 33 & 40 & 50 & 60 & 66 & 70 & 80 & 90 & 94 \\
\text{Kt CAS} & 29 & 31 & 36 & 44 & 52 & 57 & 61 & 70 & 80 & 84 \\
\end{array}
\]

(C) ALTIMETER CORRECTION PLACARD

To be displayed next to the Altimeter.

\[
\begin{array}{cccccccccc}
\text{Kt IAS (ASI units)} & 30 & 40 & 50 & 60 & 70 & 80 & 90 & 94 \\
\text{Altimeter over-read (feet)} & 5 & 15 & 25 & 40 & 50 & 65 & 75 & 80 \\
\end{array}
\]

(D) LOADING PLACARD

The placard is to be visible to the pilot.

\begin{align*}
\text{EMPTY WEIGHT:} & \quad \text{Enter weight from current weight report} \\
\text{MAX TAKE–OFF WEIGHT:} & \quad 348 \text{ kg or } 374 \text{ kg}^1 \\
\text{MINIMUM COCKPIT LOAD:} & \quad 55 \text{ kg in front seat} \\
\text{MAXIMUM COCKPIT LOAD:} & \quad 90 \text{ kg in each seat (may be reduced to 86 kg pilot to satisfy cg limit)}
\end{align*}
(E) ENGINE LIMITATIONS PLACARDS AND MARKINGS

To be displayed next to the engine instruments, and/or the instruments to be marked as detailed below.

MAX RPM: 6800 and/or a red radial line
MAX CONT RPM: 6000 and/or an amber sector between MAX CONT and MAX RPM
MAX EGT: 650°C or 1200°F (to match units of instrument) and/or a red radial line
MAX CHT: 250°C or 480°F (to match units of instrument) and/or a red radial line

(F) FUEL LIMITATIONS PLACARD

This must be based on the most recent weight report for the aircraft and displayed near to the filler cap. The examples below are for an empty weight of 186 kg or 162 kg. Adjust accordingly using empty weight from current weight report.

<table>
<thead>
<tr>
<th>With Slipper Tank</th>
<th>Without Slipper Tank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUEL</strong></td>
<td><strong>FUEL</strong></td>
</tr>
<tr>
<td>Capacity 49.6 Litres 2-stroke mix 50:1</td>
<td>Capacity 22.7 Litres 2-stroke mix 50:1</td>
</tr>
<tr>
<td>Cockpit Weight (kg)</td>
<td>Max. Fuel Load (litres)</td>
</tr>
<tr>
<td>180</td>
<td>11</td>
</tr>
<tr>
<td>175</td>
<td>18</td>
</tr>
<tr>
<td>170</td>
<td>25</td>
</tr>
<tr>
<td>165</td>
<td>31</td>
</tr>
<tr>
<td>160</td>
<td>38</td>
</tr>
<tr>
<td>155</td>
<td>45</td>
</tr>
<tr>
<td>152</td>
<td>FULL</td>
</tr>
</tbody>
</table>

95 RON minimum unleaded to BS(EN)228 or AVGAS 100LL

(G) SWITCHES

All switches are to be marked with function and sense (up=on, down=off).
(H) MISCELLANEOUS

Fireproof metal plate showing the aircraft registration to be mounted in a prominent position.

The additional limitations, warnings, and secondary controls and switches are to be placarded as below.

Front Cockpit

AEROBATICS AND SPINNING ARE PROHIBITED

TRIM: NOSE UP
       NOSE DOWN

THROTTLE: INCREASE
           DECREASE

CHOKE: ON
       OFF

EMERGENCY FUEL CUT OFF: UP FOR OFF

IGNITION: ON
          OFF

FLAPS: 0°
       15° V_{F1}: 65 mph or 57 knots IAS (to match ASI units)
       30° V_{F0}: 60 mph or 52 knots IAS (to match ASI units)

Rear Cockpit

MAXIMUM SEAT LOAD: 90 kg

DO NOT GET OUT WHEN ENGINE IS RUNNING

DO NOT ATTEMPT TO FLY THE AIRCRAFT SOLO FROM THE REAR SEAT

THROTTLE: INCREASE
           DECREASE
MANDATORY PERMIT DIRECTIVE

The following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 1995-082 CFM METAL-FAX

Subject: Air intake muffler and propeller pitch change.

Applicability: CFM Metal-Fax Shadow Series B and Shadow Series B-D microlights Serial Nos KO16, KO18, KO20, KO21, KO22, KO23, KO27, 024, 026, 028 and 029.

Reason: To conform to the Noise Certification requirements introduced on 1 April 1986. This MPD is raised to record the mandatory requirement shown in Type Approval Data Sheets Nos BM-6 Issue 3 and BM-19 Issue 2.

Compliance: Before the 1 April 1986 embody Mod 008 which requires the replacement of the foam air filter with a Rotax intake muffler, the carburettor main jet changed to No 155 and the Newton propeller changed in accordance with CFM Metal – Fax Service Bulletin No 2.

This MPD becomes effective on 29 December 1995.
MANDATORY PERMIT DIRECTIVE

The following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 1998-013 R2  CFM

Subject:  Rudder fin post.


Reason:  There have been examples of cracking at the top of the rudder fin post where the fin post enters the boom tube. In addition, there is evidence that some microlights have been unofficially modified in this area.

Compliance:  Before further flight from the effective date of this MPD inspect and, if necessary, replace/modify the rudder fin post in accordance with CFM Aircraft Service Bulletin No 12 Issue 1 dated 14 July 1998 or later CAA Approved issue.

Parts and installation instructions can be obtained from:

CFM Aircraft Ltd
Unit 2D
Eastlands Industrial Estate
Leiston
Suffolk
IP16 4LL

MANDATORY PERMIT DIRECTIVE

The following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 2001-002 R2 CFM

Subject: Cracking of tailplane spar leading edge spigot tubes.

Applicability: CFM Shadow, Streak Shadow and Star Streak Series aeroplanes.

Reason: A case has been reported of cracks developing in the male front spar spigot tube of the leading edge of the tailplane. This can result in disconnection of the front spar and loss of control of the aeroplane. Six months of feedback following the issue of the original Service Bulletin dated 15 May 2001, have revealed that the damage was likely to have been sustained as an isolated incident. As a result the Service Bulletin has been raised to issue 2, dated 15 November 2001 to reflect this information.

Compliance: At each routine inspection including pre-flight checks and at intervals not exceeding 20 flying hours, carry out the inspection/rectification action detailed in the Accomplishment Instructions of CFM Service Bulletin No 14 Issue 2 from the effective date of this MPD revision.

CFM Service Bulletin No 14 Issue 2 can be obtained from:

CFM Aircraft Ltd
Unit 2D, Eastlands Industrial Estate
Leiston
Suffolk
IP16 4LL

Tel: 01728 832353
Fax: 01728 832944
e-mail: HQ@cfm-aircraft.co.uk

Record compliance with this MPD in the aircraft log book.

The original MPD became effective on 15 May 2001 and Revision 1 became effective on 23 July 2001. Revision 2 becomes effective on 18 February 2002.

Enquiries regarding this MPD should be made to United Kingdom Civil Aviation Authority, Applications and Certification Section, Safety Regulation Group, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR
Phone: +44 (0) 1293 573149 Fax: +44 (0) 1293 573993
MANDATORY PERMIT DIRECTIVE

The following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 2003-004 CFM

Subject: Installation of ASI and altimeter correction placards.

Applicability: CFM Shadow Series B and BD aeroplanes.

Reason: Investigations undertaken by the BMAA have shown that due to the location of the static pressure source on this aeroplane type, the ASI and altimeter over-read significantly. This MPD requires placards to be fitted and an operators manual supplement to be added to indicate the necessary corrections.

Compliance: Before 1 June 2003 or at the next permit renewal, whichever is the sooner, install the correction placards in accordance with British Microlight Aircraft Association (BMAA) Service Bulletin 1681 issue 1.

A copy of BMAA Service Bulletin 1681 and further information can be obtained from:

British Microlight Aircraft Association
Bullring
Deddington
Banbury
Oxon
OX15 0TT

Tel: 01869 338888
Fax: 01869 337116
Email: cto@bmaa.org

Record compliance with this MPD in the aircraft log book.

This MPD becomes effective on 3 May 2003.
MANDATORY PERMIT DIRECTIVE

In accordance with Article 9A(5)(b) of the Air Navigation Order 2000 as amended, the following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 2004-002 R1  CFM

Subject: Under-fuselage 'slipper' fuel tank.


Compliance: Cancelled at Revision 1 and superseded by MPD 2004-007.

The original MPD became effective on 15 January 2004 and Revision 1 became effective 1 May 2004.
MANDATORY PERMIT DIRECTIVE

In accordance with Article 9A(5)(b) of the Air Navigation Order 2000 as amended, the following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 2004-007 R1 CFM

Subject: Main undercarriage


Reason: The standard undercarriage assembly of CFM Shadow, Streak Shadow and Starstreak Shadow microlights consists of a steel framework attached to the composite fuselage. The outer section of the main undercarriage consists of two GRP pultrusion rods. An under-fuselage fuel tank, known as a 'slipper tank', is available as an optional modification or as part of the basic build standard.

There have been a number of cases of main undercarriage failure on these aircraft. There have also been cases of rupture of the under-fuselage fuel tank following failure of the undercarriage. Operation of microlights using the slipper tank has been prohibited by Mandatory Permit Directives (MPDs) 2003-019 R1 and 2004-002. This action was an interim measure pending resolution of the undercarriage problem.

This MPD has been raised to revision 1 to include all CFM Shadow aeroplanes and to reference the BMAA modification.

Compliance: Before further flight, replace the standard main undercarriage assembly with an approved alternative main undercarriage. Compliance with this MPD cancels MPD 2003-019R1 and 2004-002.

The following replacement undercarriage designs are available at this time:

For all Shadow B, BD, C, CD, DD aeroplanes and for Type Approved Shadow D series microlights, see British Microlight Aircraft Association (BMAA) Microlight Airworthiness Approval Note (MAAN) 1762. Copies of BMAA MAAN 1762 and further information can be obtained from:

| British Microlight Aircraft Association | Tel: 01869 338888 |
| Bullring | Fax: 01869 337116 |
| Deddington | |
| Banbury | Email: cto@bmaa.org |
| Oxon | |
| OX15 0TT | |

continued overleaf
For Homebuilt Shadow D series aeroplanes, Streak Shadow and Starstreak microlights, see Popular Flying Association (PFA) Airworthiness Modification 11121 “Crosbie Main Undercarriage”.

For Streak Shadow aeroplanes only, PFA Airworthiness Modification 11132 “Alternative Moulded Composite Undercarriage” can be embodied as an alternative.

Copies of PFA Modifications 11121 and 11132 and further information can be obtained from:

Popular Flying Association
Turweston Aerodrome
Nr Brackley
Northants
NN13 5YD

Tel:  01280 846786
Fax:  01280 846780

Email: engineering@pfa.org.uk

Record compliance with this MPD in the aircraft log book.

The original MPD became effective on 1 May 2004, this MPD becomes effective 22 May 2004.
MANDATORY PERMIT DIRECTIVE

In accordance with Article 9A(5)(b) of the Air Navigation Order 2000 as amended, the following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

MPD: 2004-008 R1 CFM

Subject: Nosewheel undercarriage


Reason: The nosewheel undercarriage of CFM Shadow, Streak Shadow and Star Streak series microlights consists of a short vertical tubular aluminium leg which is pivoted within the composite fuselage monocoque. There have been a number of cases of noseleg failure as a result of incorrectly tensioned or degraded noseleg bungees.

This MPD has been raised to revision 1 to include all CFM Shadow microlights.

Compliance: For all Shadow B, BD, C, CD, DD aeroplanes and for Type Approved Shadow D series microlights, before further flight and subsequently at each 50 hour and annual check, inspect the noseleg bungee in accordance with British Microlight Aircraft Association (BMAA) Microlight Airworthiness Approval Note (MAAN) 1762 Appendix A.

For all CFM Streak Shadow, Star Streak and Homebuilt Shadow D series microlights, before further flight and subsequently at each 50 hour and annual check, inspect the noseleg bungee in accordance with Popular Flying Association (PFA) Service Bulletin MOD/206/002 and replace components as required.

Copies of BMAA MAAN 1762 and further information can be obtained from:

British Microlight Aircraft Association
Bullring
Deddington
Banbury
Oxon
OX15 0TT
Tel: 01869 338888
Fax: 01869 337116
Email: cto@bmaa.org

continued overleaf
Copies of PFA SB MOD/206/002 and further information can be obtained from:

Popular Flying Association
Turweston Aerodrome
Nr Brackley
Northants
NN13 5YD

Tel: 01280 846786
Fax: 01280 846780

Email: engineering@pfa.org.uk

Record compliance with this MPD in the aircraft log book.

The original MPD became effective on 1 May 2004, this MPD becomes effective 22 May 2004.