CIVIL AVIATION DIRECTIVE – 8501

MANDATORY CONTINUING AIRWORTHINESS INFORMATION – AIRWORTHINESS DIRECTIVES

MCAI

CIVIL AVIATION AUTHORITY OF MALAYSIA

ISSUE 01
REVISION 00 – 1ST FERUARY 2022

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Introduction

In exercise of the powers conferred by section 24O of the Civil Aviation Act 2019 (Act 3), the Chief Executive Officer makes this Civil Aviation Directive (CAD) 8501 – Mandatory Continuing Airworthiness Information – Airworthiness Directives pursuant to Regulation(s) 21, 26, 29, 31, 32, 34, 189 and 193 of the Malaysian Civil Aviation Regulations (MCAR) 2016.

This Directive provides the requirement pertaining to Mandatory Continuing Airworthiness Information for aircraft, engines, propellers and installed equipment and for any matters connected therewith.

This Directive is published by the Chief Executive Officer under section 24O of the Civil Aviation Act 1969 (Act 3) and come into operation on 1st February 2022.

Non-compliance with this CAD

Any person who contravenes any provision in this CAD commits an offence and shall on conviction be liable to the punishments under Section 24O (2) of the Civil Aviation Act 1969 (Act 3) and/or under Malaysia Civil Aviation Regulation 2016.

(Captain Chester Voo Chee Soon)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Directive components and Editorial practices

This Civil Aviation Directive is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as *"shall"* or *"must"*, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as "*should"* or "*may*", are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Appendices: Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Tables and Figures: These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

Attachments: Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

It is to be noted that some Standards in this Civil Aviation Directive incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Directive, the use of the male gender should be understood to include male and female persons.

Record of Revisions

Revisions to this CAD shall be made by authorised personnel only. After inserting the revision, enter the required data in the revision sheet below. The *'Initials'* has to be signed off by the personnel responsible for the change.

Rev No.	Revision Date	Revision Details	Initials

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Summary of Changes

ISS/REV no.	Item no.	Revision Details

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1 General

1.1 Citation

1.1.1 These Directives are the Civil Aviation Directives 8501 – Mandatory Continuing Airworthiness Information – Airworthiness Directives (MCAI), issue 01/Revision 00, and comes into operation on 1st February 2022.

1.1.2 This CAD 8501 – Mandatory Continuing Airworthiness Information – Airworthiness Directives, Issue 01/Revision 00 will remain current until withdrawn or superseded.

1.1.3 This Directive contains the additional standards, requirements and procedures and shall be read together with CAD 8 – Airworthiness of Aircraft.

1.2 Applicability

1.2.1 The following persons shall be subject to this Directive—

a) a registered owner/operator of an aircraft;

b) a holder of a certificate of approval for design under regulation 21 of the MCAR.

c) a holder of certificate of approval for continuing airworthiness management granted under regulation 31(1)(a) of the MCAR; and

d) a holder of certificate of approval for maintenance of aeronautical product granted under regulation 31(1)(b) of the MCAR.

1.3 Revocation

1.3.1 This CAD revokes:

a) Airworthiness Notice 4 – Mandatory Modifications & Inspections (Airworthiness Directives), issue 3 dated 1 July 1997;

b) Airworthiness Notice 19 – Electrical Generation Systems — Aircraft Below 5700 kg. MTWA, issue 2 dated 1 Oct 2002;

c) Airworthiness Notice 20 – Emergency Power Supplies for Electrically Operated Gyroscopic Bank and Pitch Indicators (Artificial Horizons), issue 1 dated 1 Apr 1987;

d) Airworthiness Notice 25 – Electrical Power Supplies for Aircraft Radio Systems, issue 1 dated 1 Apr 1987;

e) Airworthiness Notice 30 – Tyre Burst In flight — Inflation Media, issue 1 dated 1 Sept 1988;

f) Airworthiness Notice 35 – Light Aircraft piston Engine Overhaul Periods, issue 4 dated 1 Mar 2000;

g) Airworthiness Notice 36 – Routine Maintenance of Propeller Blades, issue 1 dated 1 Apr 1987;

h) Airworthiness Notice 37 – Maintenance Requirements for Variable Pitch Propellers Installed on Aircraft Holding a Malaysian Certificate of Airworthiness, issue 2 dated 1 Jul 1997;

i) Airworthiness Notice 41 – Maintenance of Cockpit and Cabin Combustion Heaters and Their Associated Exhaust Systems, issue 1 dated 1 Apr 1987;

j) Airworthiness Notice 49 – Cotton, Linen and Synthetic Fabric-covered Aircraft, issue 2 dated 1 Oct 2002;

k) Airworthiness Notice 72 – Electrical Generation Systems – Bus-car Low Voltage Warning Single Engine Aircraft with Malaysian Certificate of Airworthiness, issue 2 dated 1 Oct 2002; and

l) Airworthiness Notice 82 – Painting of Aircraft, issue 1 dated 1 Oct 2002.

1.4 Definitions

1.4.1 In this Directive, unless the context otherwise requires—

Airworthiness Directive (AD) is a regulatory document issued or adopted by CAAM under Regulation 34 which identifies aeronautical products in which an unsafe condition exists, and where the condition is likely to exist or develop in other aeronautical products of the same type design. It prescribes mandatory corrective actions to be taken or the conditions or limitations under which the aeronautical products may continue to be operated;

Aeronautical Products shall have the same meaning in MCAR 2016;

AMOC means Alternative Method of Compliance

CAM AD means Airworthiness Directive issued by CAAM pursuant to the obligation of Malaysia as the State of Design in matters that affect aviation safety. These directives arise from various sources, e.g. manufacturers Service Bulletins, in-service-difficulty reports or a result of design investigation by the CAAM;

C of A means Certificate of Airworthiness

EASA means European Aviation Safety Agency;

FAA means Federal Aviation Administration of the United States of America (USA);

ICAO means International Civil Aviation Organization;

Mandatory Continuing Airworthiness Information (MCAI) means the mandatory requirements for the modification, replacement of parts, or inspection

of aircraft and amendment of operating limitations and procedures for the safe operation of the aircraft. Among such information is that issued in the form of airworthiness directives;

State of Design means the State having jurisdiction over the organization responsible for the type design;

State of Registry means the State on whose register an aircraft is entered;

VAM AD means Airworthiness Directive issued by CAAM which are intended to introduce requirements which have a direct bearing on airworthiness or operations but which, for a variety of reasons e.g. specifically Malaysian operating experience and are unlikely to be the subject of airworthiness directive action by the State of Design.

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2 Introduction

2.1 Mandatory Continuing Airworthiness information

2.1.1 This CAD provides the means by which Mandatory Continuing Airworthiness Information (MCAI) for aeronautical products and for any matters connected therewith; made mandatory by the CAAM are notified. This includes compliance, requirements, changes to Flight Manuals or Performance Schedules, extension of compliance timescale, application for alternative method of compliance (AMOC), listing of CAM AD (Appendix 1) and VAM AD (Appendix 2) and generic requirements for Airworthiness (Appendix 3).

2.1.2 MCAI are the means used to notify aircraft owners, operators and other interested persons of unsafe conditions and to prescribe the conditions under which the aeronautical product may continue to be operated. One of the most commonly used types of MCAI issued by CAAM is an Airworthiness Directives (AD). CAAM may also consider any mandatory and alert service bulletins issued by the organisation responsible for the type design as MCAI.

2.1.3 Some requirements previously made mandatory for Malaysia registered aircraft were withdrawn or cancelled. Aircraft owners and operators should ensure that:

a) any retained modifications installed in order to comply with previous additional Malaysia requirements continue to be maintained in accordance with all applicable approved data and service information;

b) any de-modification of an aircraft is performed by approved organisations in accordance with approved airworthiness documentation. Following de-modification, a review and re-issue of the continued airworthiness instructions must be carried out and a Certificate of Release to Service obtained;

c) any data from the Type Certificate (TC) Holder that has previously been made mandatory by the CAAM, but is no longer mandatory, should still be considered for inclusion in the maintenance programme. Failure to do so could expose the aircraft to safety hazards and may invalidate the Certificate of Airworthiness.

2.2 Airworthiness Directives (AD) Categories

2.2.1 AD is generally divided into two categories:

a) Emergency AD: those of an urgent nature requiring immediate compliance upon receipt; and

b) Standard AD: those of a less urgent nature requiring compliance within a relatively longer period.

2.2.2 Airworthiness Directive (AD) is issued when it is determined that an unsafe condition exists in a product and that the same condition is likely to exist or develop

in products of the same type design. Unsafe condition means a condition, which, if not corrected, would cause the airworthiness of an aircraft to fall below the level required of Type Certification.

2.2.3 Airworthiness Directive is required to correct the unsafe condition. The compliance to the AD is mandatory. For the purpose of compliance, the prescribed requirements for the ADs will be in two (2) types—

a) For aircraft, engines, propellers, installed equipment or its modification for which Malaysia is the State of Design and CAAM as the Certifying Authority, issues ADs known as CAM AD.

CAM AD is a mandatory requirement introduced on products type certificated in Malaysia. These directives may arise from various sources, e.g. manufacturers service bulletins, in service difficulty reports or a result of design investigation by CAAM.

A summary of CAM AD is listed in Appendix 1 of this CAD and the CAM AD has the following numbering system; serial number-month-year, e.g. CAAM AD 001-04-1997; and

b) For aircraft, engines, propellers or installed equipment for which Malaysia is not the State of Design, the following are mandatory—

1) ADs issued by the Certifying Authority of State of Design of the aircraft, engines, propeller, installed equipment or its modification; and

2) ADs issued by CAAM which are known as VAM AD.

3) A summary of VAM AD is listed in Appendix 2 of this CAD and the VAM AD has the following numbering system; year-serial number e.g. VAM AD 1997-002.

2.2.4 For a revised CAM AD and VAM AD, the numbering shall be as follows;

The revision shall be in the form of numerical in nature, suffix to the AD number e.g. CAM AD 001-04-1997R1 & VAM AD 1997-002R1.

2.2.5 For a cancelled CAM AD and VAM AD, the numbering shall be as follows;

The cancellation ‘CAN’ to be suffixed to the AD number e.g. CAM AD 001-14-1997/CAN and VAM AD 1997-002/CAN

2.2.6 Starting 2022, all CAAM CAM AD and VAM AD will be published individually on CAAM website. The current comparatively small size of the aircraft type and component manufactured in Malaysia and also the small size of Malaysian fleet of civil registered aircraft are such that listing in Appendices of this CAD will only be revised periodically if needed.

2.2.7 For aeronautical products where CAAM is not the Certifying Authority of State of Design, the information of MCAI should be retrieved from the original State of Design of the aeronautical products.

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3 Requirements

3.1 Compliance

3.1.1 Malaysian registered aircraft are required to comply with applicable ADs and mandatory requirements issued by CAAM, and the Certifying Authority of the State of Design.

3.1.2 When an aircraft is affected by a mandatory airworthiness action (inspection or modification) it is illegal for the aircraft to be flown (unless permission has been granted by CAAM either generally or in relation to a specific case) until the prescribed requirement has been complied with.

3.1.3 When several regulatory authorities have issued ADs relating to a particular airframe, engine and etc. whereby the technical content of the directives addresses the same problem but the associated compliance requirements have varied from one to another, identification of the requirements to be satisfied in such cases are illustrated by the following example:

Aircraft type certificated in Canada, with USA type certificated engines, propellers type certificated by EASA and a cockpit voice recorder of USA certification fitted by the operator as a modification. The requirements to be satisfied are as follows—

a) Airframe and installed equipment associated with the type certification of the aircraft:

ADs issued by Transport Canada;

b) Engines:

ADs issued by FAA;

c) Propellers:

ADs issued by EASA;

d) Cockpit Voice Recorder (CVR):

ADs issued by FAA; and

e) VAM AD (refer to Appendix 2 to this CAD).

3.2 Responsibilities of Owners/ Operators and Individuals/ Organisations Carrying Out Maintenance and Overhaul

3.2.1 In order to ensure compliance with all applicable MCAI, the owners and operators of aircraft must ensure that they are aware of the content of any Airworthiness Directives issued by the Certifying Authority of the State of Design and of any applicable CAAM Airworthiness Directives or mandatory requirements.

3.2.2 In addition, organisations or individuals undertaking maintenance and overhaul must ensure that they are in receipt of Airworthiness Directives issued by the Certifying Authority of the State of Design, and any CAAM Airworthiness Directives or mandatory requirements applicable to the aeronautical products which they maintain or overhaul.

Note. – When an individual or organisation maintains or overhauls aeronautical products for an owner/operator whose aircraft is not registered in Malaysia, the individual/organisation must make arrangements with that owner/ operator to receive any Airworthiness Directives issued or adopted by the Certifying Authority of the State of Registry.

3.3 Mandatory changes to Flight Manuals or Performance Schedules

3.3.1 Where an AD introduces a change to an aircraft Flight Manual or Performance Schedule, the owner/operator of the affected aircraft must ensure that the change is made by attaching the AD or the documents that it specifies, to the Flight Manual or Performance Schedule.

Note. – Where permission has been given to utilise an Operations Manual in lieu of the Flight Manual, the owner/operator must ensure that the information specified in the AD is embodied in the Operations Manual within the specified compliance time.

3.4 Extension of Compliance Timescale

3.4.1 Aircraft owners, operators and contracted maintenance organisations must assess all AD relating to relevant aircraft types and initiate early requisition and/or provision of aircraft parts and/or maintenance resources to meet the AD compliance timescales.

3.4.2 Any application to extend an AD compliance timescale will be assessed by CAAM on a case-by-case basis. Extension of compliance timescale may be considered as an AMOC provided it is based on other alternative compliance methods or compensative factors. The applicant, normally supported by the organisation responsible for the type design, must demonstrate, to the satisfaction of CAAM, an equivalent level of safety. Extensions of this nature are intended to be used in exceptional circumstances that could not reasonably have been foreseen by the owner, operator or contracted maintenance organisation.

3.4.3 A justification document from the organisation responsible for the type design may be suitable to support such a time limited extension on a case by case basis.

3.5 Alternative Method of Compliance (AMOC)

3.5.1 AMOC is an approved deviation to an AD. It is a different way, other than the one specified in an AD, to address an unsafe condition on aeronautical products. An AMOC must provide a level of safety equivalent to the level of safety to be restored

by compliance with the original AD. AMOC may be issued in respect of, but are not necessarily limited to, the following:

a) Alternative modifications,

b) Alternative inspection procedures,

c) Alternative maintenance intervals and/or procedures,

d) Specific operating procedures or limitations, etc.

3.5.2 Provisions for an 'Alternative Method of Compliance with an AD' are desirable from an aircraft operator's and a TC Holder's point of view when acceptable methods are developed for AD compliance if a limited number of aircraft are eligible to these acceptable methods (and no change to the AD is planned) or while awaiting a planned revision or supersedure of an AD. The provisions for an AMOC also applicable to AD linked to any modifications or an STC and will only be approved after the related change is approved.

3.5.3 Any application to satisfy an AD by means of an 'alternative method of compliance' will be assessed by CAAM on a case by case basis and will normally need to be supported by the organisation responsible for the type design. The applicant must demonstrate, to the satisfaction of CAAM, an equivalent level of safety.

3.5.4 An alternative method of compliance approved by the Certifying Authority of the State of Design may be proposed for CAAM approval.

3.5.5 The supersedure of an AD always and automatically invalidates any AMOC related to that AD. Even though the technical solution as specified in an AMOC may still be acceptable for compliance with the new AD, this acceptability must be confirmed. To achieve this, the AMOC approval holder (if that organisation wishes to remain the responsible approval holder) would need to apply for a new AMOC.

3.6 Application for an AMOC

3.6.1 An application for approval of an AMOC shall be made in a form and manner established by CAAM.

3.6.2 When applying for an AMOC, the applicant shall:

a) submit Application for Approval of Alternative Method of Compliance (AMOC) With Airworthiness Directive (AD) form ref. no. CAAM/AW/CAD8501-03;

b) include in the application the information required by paragraph 3.5.1 – 3.5.4 of this CAD as required.

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4 Appendices

4.1 Appendix 1 – Airworthiness Directives (CAM AD) – Malaysia as the State of Design

1 The Airworthiness Directives, CAM AD listed in this Appendix have been issued in accordance with paragraph 2.2.3 a) of this CAD. These directives affect aviation safety which requires immediate attention. Be informed that no person may operate an aircraft which an AD applies, except in accordance with the requirements of the ADs.

2 The CAM AD number in the left-hand column of the tables should be quoted in aircraft records when certifying compliance with the associated AD.

CAM AD No.	SUBJECT AIRCRAFT / ENGINE / PROPELLER / EQUIPMENT	ISSUE DATE
001-01-2004 (Superseded by 001-01-2004R1)	Eagle X-TS, X-TS 150 & 150B • Flap hinge support bracket - inspection	19 Jan 2004
001-08-2004	Eagle X-TS, X-TS 150 & 150B • Port and Starboard Main Undercarriage Attach Bracket - Inspection	12 Aug 2004
001-10-2004	Eagle X-TS • Co-Pilot Rudder Pedal Assembly	30 Oct 2004
002-10-2004	Eagle X-TS 150 & 150B • Co-Pilot Rudder Pedal Assembly	30 Oct 2004
001-01-2004R1	Eagle X-TS, X-TS 150 & 150B • Flap hinge support bracket - inspection	23 Dec 2005
001-07-2007	Eagle X-TS, X-TS 150, & 150B • Flap hinge and flap hinge support bracket - inspection	20 Jul 2007

3 This Appendix lists all CAM AD issued up to the date of this CAD at issue 01/revision 00. CAM AD issued thereafter will be available on CAAM website.

4 CAM AD may be obtained upon request directly from Airworthiness Division, CAAM. Please refer to aircraft, engine, propeller, and/or equipment models for which CAM AD are required.

5 Please direct all queries with regard to CAM AD to:

Civil Aviation Authority of Malaysia
(Airworthiness Division)
No. 27, Persiaran Perdana,
Level 2, Block Podium A, Precinct 4
Federal Government Administrative Centre
62618 Putrajaya
MALAYSIA
Tel: 603-88714000
Fax: 603-88714069

4.2 Appendix 2 – Airworthiness Directives (VAM AD) – Malaysia as the State of Register

1 The Airworthiness Directives, VAM AD listed in this Appendix have been issued in accordance with paragraph 2.2.3 b) 2). These AD affect aviation safety which requires immediate attention. Be informed that no person may operate an aircraft which an AD applies, except in accordance with the requirements of the ADs.

2 The VAM AD number in the left-hand column of the tables should be quoted in aircraft records when certifying compliance with the associated AD.

VAM AD No.	SUBJECT AIRCRAFT / ENGINE / PROPELLER / EQUIPMENT	REFERENCE DOCUMENT
1984 – 001	Bell 206 A/B series helicopters	MCAD 84/01 RI
1984 – 002	Bell 206 A/B series helicopters	MCAD 84/02
1984 – 003	Bell 206 A/B series helicopters	MCAD 84/03
1984 – 004	Cessna 206 variants	MCAD 84/04
1984 – 005	Dehavilland Aircraft of Canada DHC-6 series aircraft	MCAD 84/05
1984 – 006	Dehavilland Aircraft of Canada DHC-6 series aircraft	MCAD 84/06
1984 – 007	Allison 250-B17, -C20 and –C28 series engines	MCAD 84/07
1984 – 008	Allison 250-C28 and –C30 series engines	MCAD 84/08
1984 – 009	Allison 250-B17, -C20 and –C28 series engines	MCAD 84/09
1988 – 003	British Aerospace 125 series aircraft with Garrett TFE 731-3 series engines	MCAD 88/36
1988 – 004	Bell 206B and 206L series helicopters	MCAD 88/37
1988 – 005R1	Airbus A300 and A310-200 series airplanes, and Boeing 737-200, 737-300, 757-200, 767-200, and 767-300 series airplanes, which are approved for "extended range," "EROP," or "ETOP" operations.	MCAD 88/38
1989 – 002	Boeing 737-200 series aircraft	MCAD 89/41
1989 – 003	Piper PA-28 series aircraft fitted with Curtiss fuel strainer drain valve	MCAD 89/42
1990 – 001	Piper PA-38-112 series aircraft	MCAD 90/43
1990 – 002	Pilatus PC-6 aircraft	MCAD 90/44
1990 – 003	Aerospatiale AS355 helicopters	MCAD 90/45
1990 – 004	Beech 200 series aircraft	MCAD 90/46
1990 – 005	Sikorsky S61 helicopters	MCAD 90/47
1994 – 001	Fokker F50 aircraft	MCAD 94/53
1994 – 002	PA18-150 Super Cub series aircraft	MCAD 94/54

VAM AD No.	SUBJECT AIRCRAFT / ENGINE / PROPELLER / EQUIPMENT	REFERENCE DOCUMENT
1994 – 003R1	Allison 250 series engines installed in single and twin-engine helicopters.	MCAD 94/55
1994 – 005	Piper PA 28 series aircraft	LTO 027
2004 – 001	All aircraft below 5700 kg AUW	LTO 035

3 The following VAM AD have been cancelled:

VAM AD NO.	SUBJECT AIRCRAFT / ENGINE / PROPELLER / EQUIPMENT	REFERENCE DOCUMENT
1986 – 001	Ground Proximity Warning System (GPWS) installed on aircraft certificated in the Transport Category for the carriage of more than 30 passengers and aircraft over 15,000 kg MTWA.	MCAD 86/29
1988 – 001	Beech 200 series aircraft	MCAD 88/34
1988 – 002	All instrument and Flight Research Inc. altimeters Part No. IFR45-20M	MCAD 88/35
1988 – 006	Twin engine aircraft with engine over heat and fire detector system	MCAD 88/39
1989 – 001	Sikorsky S61N helicopters	MCAD 89/40
1990 – 006	Sikorsky S61 helicopters	MCAD 90/44
1991 – 001	Aircraft below 5700 kg MTWA fitted with electrically operated stall warning	MCAD 91/49
1991 – 002	Boeing 737 aircraft fitted with Type III exit handles with integral moulded cover clamped to the operating handle.	MCAD 91/50
1991 – 003	Aeroplanes over 5700 kg MTWA certificated in Transport category and configured to carry 20 or more passengers	MCAD 91/51
1991 – 004	Portable oxygen equipment carried in Transport (Passenger) category aircraft over 5700 kg MTWA and all aeroplanes manufactured after 1 January 1991 over 5700 kg MTWA	MCAD 91/52
1994 – 004	Aerospatiale AS 355 Helicopters	MCAD 94/56
1995 – 001	All aircraft and helicopters certificated in any category and fitted with Pacific Scientific lap belt assemblies and restraint	LTO 029A

4 This Appendix lists all VAM AD issued up to the date of this CAD at issue01/revision 00. VAM AD issued thereafter will be available on CAAM website.

5 Please direct all queries with regard to VAM AD to:

Civil Aviation Authority of Malaysia
(Airworthiness Division)
No. 27, Persiaran Perdana,
Level 2, Block Podium A, Precinct 4

Federal Government Administrative Centre
62618 Putrajaya
MALAYSIA
Tel: 603-88714000
Fax: 603-88714069

6 **VAM AD No. 1984-001**

MCAD No.: MCAD 84/01 Rev. 1

Applicability: Bell 206 A/B not fitted with low fuel quantity warning light.

Associated Material: (previously issued as LTO 028)

Description: Fuel quantity system calibration.

Compliance – Requirement:

Compliance is required before issue of C of A and for aircraft in service, at periods not exceeding 12 months since last calibration.

1) With aircraft in normal calibration attitude, 5 U.S. gallons in fuel tank and bus bar voltage of 27.5, adjust gauge to read zero. Check calibration at 5 and 10 U.S. gallons.

2) Check gauge reading on battery only and with generator on line at Flight Idle rpm.

   Note. –

   In complying with this requirement, the gauge should be adjusted to read zero when the fuel tank contains the following:

   a) Total unusable fuel (includes undrainable and drainable fuel), and

   b) US gallons of usable fuel.

   Effectively the disposable fuel (i.e. fuel at pilot's disposal for all performance calculation) is reduced by 5 US gallons. However, the manufacturer's figures for usable and unusable fuel are unchanged and these data should be used for the purpose of load and balance calculation.

Therefore, the weight and CG schedule should reflect the approved manufacturer data and a note in the 'Disposable Load' Section to advise the pilot that the fuel is 5 US gallons less than the actual usable fuel.

7 **VAM AD No. 1984-002**

MCAD No.: MCAD 84/02

Applicability: Bell 206 A/B

Associated Material: -

Description: Fuel tank inspection

Compliance – Requirement:

a) At 300 hours intervals or not exceeding twelve months drain fuel tank and carry out internal inspection for contamination

b) At 1200 hours intervals or not exceeding 3 years remove fuel tank for cleaning and detailed inspection.

Compliance is required before issue of C of A for used aircraft, if action required by (a) and (b) have not been previously completed within the periods specified. Repeat at specified intervals.

8 **VAM AD No. 1984-003**

MCAD No.: MCAD 84/03

Applicability: Bell 206 A/B

Associated Material: TB206-81-56

Description: Inspect and modify engine bellmouth attach fittings

Compliance – Requirement:

Inspect and modify engine bellmouth attach fittings as necessary in accordance with Technical Bulletin.

Compliance is required before issue of C of A or not later than next 100 hours inspection for existing Malaysia registered aircraft.

9 **VAM AD No. 1984-004**

MCAD No.: MCAD 84/04

Applicability: Cessna 206 Variants

Associated Material: -

Description: Inspect flap motor support arm

Compliance – Requirement:

Inspect flap motor support arm for looseness and down limit switch for condition, particularly cracking. Complete at next and every subsequent 100 hours inspection.

10 **VAM AD No. 1984-005**

MCAD No.: MCAD 84/05

Applicability: Dehavilland Aircraft of Canada DHC-6

Associated Material: SB 6/415

Description: Introduction of OPEN/CLOSED labels to cockpit and rear doors

Compliance – Requirement:

Compliance required before issue of C of A. CAAM will consider alternative modifications to SB 6/415.

11 **VAM AD No. 1984-006**

MCAD No.: MCAD 84/06

Applicability: Dehavilland Aircraft of Canada DHC-6

Associated Material: SB 6/368

Description: Removal from service of lithium batteries in ELTs.

Compliance – Requirement:

Compliance is required before issue of C of A.

12 **VAM AD No. 1984-007**

MCAD No.: MCAD 84/07

Applicability: Allison 250-B17, C20, C28 series engines

Associated Material: -

Description: Inspection power turbine inner and outer shaft and associated components

Compliance – Requirement:

Inspection power turbine inner and outer shaft and associated components for corrosion at 900 hours interval since last inspection.

Inspection requirements apply to all shafts regardless of CEB compliance standard

13 **VAM AD No. 1984-008**

MCAD No.: MCAD 84/08

Applicability: Allison 250-C28 and – C30 series engines

Associated Material: CEB 72-2063, CEB 72-3059

Description: Introduction of roller bearing

Compliance – Requirement:

Introduction of roller bearing at the No 2½ location in lieu of the existing ball bearing.

Compliance required at the next overhaul of all compressor and gearbox modules.

Operators should note that pre and post modification compressor/gearbox modules are not inter-changeable.

14 **VAM AD No. 1984-009**

MCAD No.: MCAD 84/09

Applicability: Allison 250-B17, C20, C28 series engine

Associated Material: Allison Gas Turbine Operation & Maintenance Manual

Description: Inspection and cleaning

Compliance – Requirement:

a) Inspection and cleaning of power turbine support scavenge oil strut.

b) Inspection and cleaning of power turbine support strut pressure oil nozzle.

For all engines with 500 hours or more in service since new/last overhaul, comply with (a) and (b) within 10 hours or within 100 hours from when (a) and (b) were last completed, whichever is later.

Repeat interval 100 hours.

15 **VAM AD No. 1988-003**

MCAD No.: MCAD 88/36

Applicability: British Aerospace 125 aircraft with Garrett TFE 731-3 engines

Associated Material: (previously issued as LTO 003), SB 72-1-2844A

Description: Modification of engine turbine interstage transition duct.

Compliance – Requirement:

Incorporate modification no. 252844A i.a.w. British Aerospace SB 72-1-2844A.

16 **VAM AD No. 1988-004**

MCAD No.: MCAD 88/37

Applicability: Bell 206B and 206L helicopters

Associated Material: (previously issued as LTO 004)

Description: Modification of hydraulic system switch

Compliance – Requirement:

a) The hydraulic system switch is to be relocated to a suitable position on the centre console, well away from the fuel valve switch.

b) The hydraulic system and fuel valve switches must be inspected for wear. Any wear is cause for replacement.

c) The fuel valve must be coloured **RED**.

Minor modification action is necessary for the relocation of the hydraulic switch.

17 **VAM AD No. 1988-005 R1**

MCAD No.: MCAD 88/38

Applicability: Airbus Model A300 and A310-200 series airplanes, and Boeing Models 737-200, 737-300, 757-200, 767-200, and 767-300 series airplanes, which are approved for operations over a route that contains a point farther than one hour flying time at the normal one-engine inoperative cruise speed (in still air) from an adequate airport, referred to as "extended range," "EROP," or "ETOP" operations.

Associated Material: (previously issued as LTO 005), FAA AD 88-21-03R1

Description: To prevent failure of Fuel Crossfeed Valve

Compliance – Requirement:

a) Add the following instructions into the appropriate Section of the Approved Flight Manual:

Fuel Crossfeed Valve

Perform an operational check of the fuel crossfeed valve during the last hour of cruise flight during each extended range operation. Enter operational check outcome in the aircraft log.

b) Replace, prior to next flight, any fuel crossfeed valve not exhibiting proper operation with a serviceable valve.

18 **VAM AD No. 1989-002**

MCAD No.: MCAD 89/41

Applicability: Boeing 737-200 aircraft

Associated Material: (previously issued as LTO 010)

Description: Inspection of aileron centring mechanism springs

Compliance – Requirement:

1) Perform the following:

   a) Inspect aileron centring mechanism springs (ref. Boeing IPC 27-10-00 Figure 29, Item 150) for pitting corrosion, particularly on internal surfaces of coils and for evidence of fatigue cracks.

   b) Remove for further inspection any springs found to be corroded. Springs having pitting corrosion are to be replaced before further flight.

   c) Replace any cracked springs before further flight.

2) Repeat inspection at 12 monthly intervals.

3) If any discrepancies are found, submit a report to the Airworthiness Division, CAAM.

19 **VAM AD No. 1989-003**

MCAD No.: MCAD 89/42

Applicability: Piper PA-28 series aircraft fitted with Curtiss fuel strainer drain valve, including those modified in accordance with CSE Service Bulletin No. 6/75.

Associated Material: (previously issued as LTO 012)

Description: Placarding of the Curtiss fuel strainer drain valve.

Compliance – Requirement:

Modify by installing a placard adjacent to the fuel strainer drain valve stating:

WARNING
ENSURE FUEL DRAIN IS CLOSED AFTER USE

Note: Letters to be clear and at least 4 mm high on a contrasting background.

Insert a copy of this Directive into the Limitations Section of the Pilot Operating Handbook/Flight Manual.

20 **VAM AD No. 1990-001**

MCAD No.: MCAD 90/43

Applicability: Piper PA-38-112 aircraft

Associated Material: (previously issued as LTO 013)

Description: Inspection of main landing gear stub axle for cracks

Compliance – Requirement:

Inspect the root of each stub axle for cracks using a dye penetrant or equivalent NDT inspection technique, paying particular attention along the radius between the stub axle shaft and the flange. REPLACE any cracked stub axle.

REPEAT INSPECTION at every 100 hourly or annual intervals whichever is sooner. Report all findings to the CAAM Airworthiness Division, giving details on the position of any crack found and the number of hours the part has accumulated in service.

21 **VAM AD No. 1990-002**

MCAD No.: MCAD 90/44

Applicability: Pilatus PC-6 aircraft

Associated Material: (previously issued as LTO 014)

Description: Inspection of lift strut assembly for corrosion

Compliance – Requirement:

Remove wings struts and examine for corrosion at fuselage to strut attachments and wing to strut attachments. Remove all connecting plates and examine for corrosion.

Repeat inspection at every out of phase inspection (annual check). Report all findings to the CAAM Airworthiness Division, giving details of damage and time of last inspection.

22 **VAM AD No. 1990-003**

MCAD No.: MCAD 90/45

Applicability: Aerospatiale AS355 Helicopters

Associated Material: (previously issued as LTO 015)

Description: Battery over-temperature sensor check

Compliance – Requirement:

Inspect the battery over-temperature sensor connector for the correct installation of the internal link between connector pins 2 and 3. If the link is missing or improperly installed, or if an approved modification to connect pins 2 and 3 is not installed, ensure that a link is correctly installed.

23 **VAM AD No. 1990-004**

MCAD No.: MCAD 90/46

Applicability: Beech 200 aircraft

Associated Material: (previously issued as LTO 016)

Description: Inspection of fuselage skin under the wing fillet for corrosion

Compliance – Requirement:

1) Remove fuselage-to-wing fillets and inspect for corrosion. Rectify as necessary.

2) Remove and discard Scotch foam from wing fillets. Clean and re-protect surface prior to refitment.

3) Repeat inspection at annual intervals. Report all findings to the CAAM Airworthiness Division.

24 **VAM AD No. 1990-005**

MCAD No.: MCAD 90/47

Applicability: Sikorsky S61 Helicopters

Associated Material: (previously issued as LTO 017)

Description: Tightening Torque Check of nuts of T-bolts connecting input drive shaft to main gearbox flange.

Compliance – Requirement:

1) Check and record tightening torque of nuts of T-bolts connecting input drive shaft flange to main gearbox (splined coupling) flange.

2) Replace nuts exhibiting tightening torques below limits with new parts meeting maintenance manual acceptance criteria for weight spread and run-on torque checks. An installed engine vibration check must then be performed before further flight.

3) Repeat check at intervals not to exceed 200 flight hours. Report all findings to CAAM Airworthiness Division.

Note. –

ACCOMPLISHMENT INSTRUCTIONS

a) If using dial torque meter, check and record tightening torque by restraining T-bolt head from turning and progressively applying torque to the minimum applicable tightening torque requirement (MM 71-10 table 401 refers). If actual tightening torque exhibited is less than the minimum required, reject and replace nuts.

b) If using break-back torque wrench, set at minimum applicable torque, datum mark nut and flange for relative movement, restrain T-bolt head from turning and check tightening torque. For unit where tightening torque is less than minimum requirement, mark and record arc of nut rotation required to achieve minimum torque value, then reject and replace nuts.

25 **VAM AD No. 1994-001**

MCAD No.: MCAD 94/53

Applicability: All Fokker 50 aircraft

Associated Material: (previously issued as LTO 021), FOKKER SBF 50-30-012

Description: Inspect/Modify back of windshield wiper switch panel.

Compliance – Requirement:

Modify the aircraft in accordance with Service Bulletin F50-30-012 dated 31 Jan 1991.

26 **VAM AD No. 1994-002**

MCAD No.: MCAD 94/54

Applicability: PA18-150 SUPER CUB

Associated Material: (previously issued as LTO 022), Piper SB 706B

Description: Failures of the lower horizontal stabilizer brace wire fuselage attachment tab.

Compliance – Requirement:

Modify the aircraft in accordance with Service Bulletin 706B dated 9 Oct 1991.

27 **VAM AD No. 1994-003R1**

MCAD No.: MCAD 94/55

Applicability: Allison 250 series engines installed in single and twin-engine helicopters.

Associated Material: (previously issued as LTO 023), , EASA AD 2004-0009 R2 (previously issued as UK CAA AD 010-12-92)

Description: Maintenance Instructions for all control system plumbing connecting the Gas Producer Fuel Control, the Power Turbine Governor, or the Compressor

Compliance – Requirement:

1) **Inspect** the 'B'-nuts of all control system plumbing connecting the Gas Producer Fuel Control, the Power Turbine Governor, or the Compressor (Pc, Py, Pr, Pg, Po, P1, P2, pipelines) for indication of slippage at intervals not exceeding 100 hours.

2) During maintenance which involves disturbing any control system plumbing connecting the Gas Producer Fuel Control, the Power Turbine Governor, or the Compressor (Pc, Py, Pr, Pg, Po, P1, P2, pipelines),:-

   a) **Comply** with the requirements of Allison (now Rolls Royce Corp.) Alert Commercial Service Letter Reference CSL–A–169, A–1166, A–2113, A–3117 and A–4036 Recommendations 2 to 9 and 11 to 16.

   b) **Record** the 'B'-nut torque values in the relevant aircraft technical records.

28 **VAM AD No. 1994-005**

Applicability: Piper PA28 series

Associated Material: (previously issued as LTO 027)

Description: Inspection of MLG cylinder i.a.w. Piper SL 760

Compliance – Requirement:

1) Comply with the requirements of paragraph 1 and 2 of PSL 760. Pay particular attention to the areas shown by arrows.

2) Raise the necessary amendment to incorporate the repetitive inspection into the maintenance schedule.

Repeat inspection every 100 FH or 1 year whichever is the sooner.

29 **VAM AD No. 2004-001**

Applicability: All aircraft below 5700 kg AUW

Associated Material: (previously issued as LTO 035)

Description: serviceability check of the ELT

Compliance – Requirement:

1) A serviceability check of the ELT is to be carried out every 4 months.

2) The ELT battery is to be checked for full voltage, every 6 months.

4.3 Appendix 3 – Generic Requirements for Airworthiness

1 The Generic Requirements (GR) listed in this appendix were published previously as Airworthiness Notices (AN). These generic requirements are mandatory for Malaysian registered aircraft.

2 The reference GR number in the left-hand column of the table should be quoted in the aircraft records when certifying compliance with the associated requirements.

Table 1 Current Generic Requirements

GR NO.	PREVIOUS AN NO.	TITLES
GR 01	AN 19 issue 2 dated 1 Oct 2002	Electrical Generation Systems — Aircraft Below 5700 kg. MTWA
GR 02	AN 20 Issue 1 dated 1 Apr 1987	Emergency Power Supplies for Electrically Operated Gyroscopic Bank and Pitch Indicators (Artificial Horizons)
GR 03	AN 25 Issue 1 dated 1 Apr 1987	Electrical Power Supplies for Aircraft Radio Systems
GR 04	AN 30 Issue 1 dated 1 Sept 1988	Tyre Burst In flight — Inflation Media
GR 05	AN 35 Issue 4 dated 1 Mar 2000	Light Aircraft piston Engine Overhaul Periods
GR 06	AN 36 Issue 1 dated 1 April 1987	Routine Maintenance of Propeller Blades
GR 07	AN 37 Issue 2 dated 1 Jul 1997	Maintenance Requirements for Variable Pitch Propellers Installed on Aircraft Holding a Malaysian Certificate of Airworthiness
GR 08	AN 41 Issue 1 dated 1 Apr 1987	Maintenance of Cockpit and Cabin Combustion Heaters and Their Associated Exhaust Systems
GR 09	AN 49 Issue 2 dated 1 Oct 2002	Cotton, Linen and Synthetic Fabric-covered Aircraft
GR 10	AN 72 Issue 2 dated 1 Oct 2002	Electrical Generation Systems – Bus-car Low Voltage Warning Single Engine Aircraft with Malaysian Certificate of Airworthiness
GR 11	AN 82 Issue 1 dated 1 Oct 2002	Painting of Aircraft

Table 2 – Cancelled Mandatory Airworthiness Notices

AN NO.	ISSUE	DATE	TITLES	REMARKS
4	3	1 July 1997	Mandatory Modification and Inspection (Airworthiness Directives)	CAD 8501
	4	1 September 1994	Appendix to Notice No. 4	CAD 8501
	2	1 October 2002	Appendix 1 to Notice No. 4	CAD 8501
	2	1 October 2002	Appendix 2 to Notice No. 4	CAD 8501
	2	1 October 2002	Appendix 3 to Notice No. 4	CAD 8501
13	2	1 September 1994	Return to service of aircraft items recovered from aircraft involved inaccidents/incidents.	
15	2	1 July 1997	Tyres and wheels fitted to aircraft certificated in the Transport Category.	
16	1	1 April 1987	Automatic Direction Finding Equipment on turbine-engine, aeroplanes andhelicopters.	CAGM 8712
17	1	1 April 1987	Vertical Speed Indicators	CAGM 8709
19	2	1 October 2002	Electrical generation systems — aircraft below 5700 kg. MTWA	GR 01
19A	1	1 September 1994	Electrical power supplies — Light aircraft, Care and Maintenance	
20	1	1 April 1987	Emergency power supplies for electrically operated gyroscopic bank andpitch indicators (artificial horizons)	GR 02
21	1	1 April 1987	Internal emergency lighting systems	
25	1	1 April 1987	Electrical power supplies for aircraft radio systems	GR 03
26	5	1 July 1997	Light aircraft Emergency Locator Transmitters	
26A	1	1 October 2002	Emergency Locator Transmitter (ELT) for Aircraft above 5700kg MTWA	
30	1	1 September 1988	Tyre burst in flight — inflation media	GR 04
31	1	1 April 1987	Toilet flush motors	
32	2	1 October 2002	Cabin and toilet fire protection	
33	2	1 October 2002	Unprotected starter circuits in aircraft not exceeding 5700 kg. MTWA	
34	1	1 April 1987	Cargo containment	
35	4	1 Mar 2000	Light Aircraft piston Engine Overhaul Periods	GR 05
36	1	1 Apr 1987	Routine Maintenance of Propeller Blades	GR 06
37	2	1 July 1997	Maintenance requirements for variable pitch propellers installed onaircraft holding a Malaysian Certificate of Airworthiness	GR 07
	3	1 March 2000	Appendix to Notice No. 37	GR 07
38	2	1 July 1997	Flame resistant furnishing materials	
39	2	1 September 1994	Aircraft seats — resistance to fire	

AN NO.	ISSUE	DATE	TITLES	REMARKS
41	1	1 April 1987	Maintenance of cockpit and cabin combustion heaters and their associated exhaust systems	GR 08
47	2	1 July 1997	Galley equipment	
49	2	1 Oct 2002	Cotton, Linen and Synthetic Fabric-covered Aircraft	GR 09
50	3	1 July 1991	Access to and opening of Type III and Type IV Emergency exits	
56	2	1 July 1991	Floor proximity emergency escape path marking	
57A	1	1 October 2002	Aircraft Field Loadable Software	CAD 8301
59	2	1 July 1991	Improved flammability test standards for cabin interior materials	
60	3	1 October 2002	Class C and D cargo or baggage compartment — fire containment capability	
61	2	1 October 2002	Minimum space for seated passengers	
63	1	1 July 1991	Portable oxygen equipment pressure relief	
64	1	1 July 1997	Electrical Cable Failure	
65	1	1 September 1994	Altimeters in aircraft	
67		8 November 1996	Printing of Malaysian Flag and the wording 'Malaysia' on aircraft registered in Malaysia	
72	2	1 Oct 2002	Electrical Generation Systems	GR 10
74	1	1 March 2000	Scales of Equipment Required for Aeroplanes — MCAR Fifth (5th Schedule Paragraph (4) Table.	
74A	1	1 March 2000	Scales of Equipment Required for Helicopters and Gyroplanes — MCAR Fifth (5th) Schedule Paragraph (4) Table.	
79	1	1 October 2002	Aeroplanes required to be equipped with Ground Proximity Warning Systems (GPWS) – Commercial Airport Transport	CAD 6 Part 1
79A	1	1 October 2002	Aeroplanes required to be equipped with Ground Proximity Warning Systems (GPWS) – Non-Commercial Airport Transport.	CAD 6 Part 2
80	1	1 October 2002	Aircraft Security	
82	1	1 October 2002	Painting of Aircraft	GR 11
83	1	1 October 2002	Flight Recorders	CAD 6 Part 1
84	1	1 October 2002	Airborne ILS (Localiser), VOR and VHF Communications Receivers Improved FM Broadcast Interference Immunity Standards.	

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5 Attachments

5.1 Attachment A – GR No 01: Electrical Generation Systems — Aircraft Below 5700 kg. MTWA

(Previously issued as Airworthiness Notice no. 19 issue 2 dated 1 Oct 2002)

1 Introduction

1.1 Investigations into accidents and incidents involving total loss of generated electrical power to aircraft below 5700 kg MTWA have shown certain inadequacies in the standard of failure warnings and indications provided. Experience has shown that the loss of generated electrical power can remain undetected for a significant period of time, resulting in the serious depletion of the available battery capacity and reduced duration of supplies to essential services under these conditions.

1.2 The purpose of this GR is to publish requirements for the retrospective modification of certain aircraft to ensure that a clear and unmistakable warning of loss of generated electrical power is given, and to preserve or provide sufficient electrical energy to operate essential services for an adequate period of time in the event of such a loss occurring.

2 Requirement

2.1 For all multi-engine aircraft below 5700 kg MTWA compliance with paragraphs 2.2, 2.3, 2.4 and 2.5 of this GR, or with a CAAM approved alternative (as appropriate) providing an equivalent level of airworthiness, is required.

2.1.1 Where it can be shown that an aircraft is fitted with such limited electrical and radio equipment, or is certificated to operate under such limited conditions (e.g. VMC day only) that the loss of generated electrical power would not significantly prejudice safe flight, the CAAM will, on application, waive this requirement where it is satisfied that compliance would not be justified in the circumstances of a particular case.

2.2 Clear visual warning shall be provided, within the pilot's normal line of sight, to give Indication of either—

a) reduction of the generating system voltage to a level where the battery commences to support any part of the main electrical load of the aircraft; or

b) loss of the output of each engine driven generator at the main distribution point or busbars.

2.3 The battery capacity shall be such that in the event of a complete loss of generated electrical power, adequate power will be available for a period of not less than 30 minutes following the failure, to support those services essential to the continued safe flight and landing of the aircraft, (see paragraph 3.1). This includes an assumed period of not less than 10 minutes from operation of the warning specified in paragraph 2.2 for completion of the appropriate drills. This delay period may be reduced to not less than five minutes if the warning system is provided with "attention getting" characteristics (e.g. a flashing light). For the purpose of calculations it shall be assumed that the electrical load conditions at the time of failure are those appropriate to normal cruising flight at night (see paragraph 3).

2.4 Where all gyroscopic attitude reference instruments, i.e. bank and pitch indicator(s) and turn and slip indicator(s), are dependent on electrical power for their operation, at least one of these Instruments shall continue to operate without crew action for the prescribed 30-minute period.

Note. –

1) For certain aircraft types a turn and slip indicator may not be acceptable as the sole remaining attitude reference instrument.

2) Certain aircraft are equipped with both electrically operated and air driven attitude reference instruments. In such cases the air driven instrument(s) will be accepted as providing the emergency attitude information provided that the requirements of paragraph 2.4.1 are met.

2.4.1 The instrument(s) with which the requirement of 2.4 will be met shall be clearly designated and:

a) shall be so located on the instrument panel that it will be visible to, and usable by the pilot from his normal position; and

b) shall be provided with means of indicating that the power supply to the instrument is operating correctly.

2.5 Precise drills covering crew action in the event of electrical generation system failures and malfunctions shall be included in the appropriate aircraft manual(s), together with a statement of the battery endurance under specified load condition

3 Additional Information

3.1 When ascertaining that the installed battery capacity is adequate for compliance with 2.3, the following loads should be taken into account:

a) Attitude information (where applicable in accordance with paragraph 2.4).

b) Essential radio communication.

Note. –

For the purpose of calculations it will normally be accepted that intermittent use of single VHF communication equipment satisfies this requirement. Utilisation on the basis of a total 15 minutes reception plus 3 minutes transmission in the 30 minutes period would be an acceptable interpretation.

c) Essential cockpit lighting.

d) Pitot head heater (applicable only to those aircraft certificated for flight in icing conditions).

e) Any other services essential for the continued safe flight and landing of the particular aircraft.

f) Those services which cannot readily be shed when carrying out the drills required under paragraph 2.5.

3.2 In order to ensure that the essential services, taken into account in accordance with 3.1, will function adequately for the prescribed period, the calculation of the duration of battery supply should normally be based on the following assumptions:

a) only 75% of the 'name plate' rating of the battery is available (this Is to take into consideration loss of capacity with age and a realistic state of charge).

b) The voltage/ time discharge characteristic of the battery, appropriate to the load of the listed services, is not extended beyond a battery terminal voltage of 21.5 volts on a 24 volt system, pro rata for 12 volt systems; (this is to ensure that the voltage available throughout the prescribed period Is adequate for satisfactory operation of the services).

Note. –

Only where compliance with this requirement cannot be shown within the criteria of paragraphs 3.1 and 3.2 will consideration has to be given to the fitment of additional or larger capacity, batteries to particular aircraft.

3.3 Applications for the approval of modifications necessary to ensure compliance with this GR should be made to the CAAM with reference to CAD 8104 as appropriate.

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5.2 Attachment B – GR No 02: Emergency Power Supplies for Electrically Operated Gyroscopic Bank and Pitch Indicators (Artificial Horizons)

(Previously issued as Airworthiness Notice no. 20 issue 1 dated 1 Apr 1987)

1 Introduction

1.1 Studies of those aircraft accidents and incidents in recent years which have involved total loss, or interruption, of generated electrical supplies on public transport aircraft indicate that major factor in the ability of the crew to maintain safe flight in the continuation of presentation to the pilot of reliable aircraft attitude Information. Fatal accidents have been attributed to failure of power supplies resulting in the loss of horizon information for flight in 'blind' conditions. Incidents have also occurred which could have been catastrophic if the crew had been totally dependent on horizon instrument, rather than visual, information.

1.2 All public transport aircraft operated on the Malaysian Register, the safety of which depends on electrical services, are equipped with some form of standby or emergency electrical power supply. On many aircraft these emergency supplies are provided by batteries of sufficient capacity to maintain essential services for a flight time sufficient to reach an airfield and make a landing. However, on a number of aircraft types the adequacy and duration of these supplies Is critically dependent on crew response time in recognising the emergency and in completing particular drills to isolate the battery supply to prevent it being dis-charged into loads on the main electrical system. It is considered that the ability of the crew to cope with a major interruption of electrical supplies would be improved if they had knowledge that continuity of horizon information was not totally dependent on their prompt and correct execution of emergency drills.

1.3 The purpose of this GR is to require the retrospective modification of certain classes of aircraft to ensure that continuity of horizon information is maintained

1.4 Aircraft types fitted with air driven gyroscopic bank and pitch indicators are exempted from this GR.

2 Compliance

2.1 Compliance with paragraphs 2.2 and 2.3 of this GR, or with a CAAM approved alternative providing an equivalent level of safety is required as a condition for the issue of a Certificate of Airworthiness for aircraft within the following classifications:-

a) aircraft operated for the purposes of public transport and certificated for the carriage of more than 19 persons over the age of three years.

b) aircraft with an MTWA in excess of 15,900 kg.

2.2 Where it cannot be shown that in the event of a total failure of the main electrical generating system an adequate supply will be available automatically to a suitable bank and pitch indicator for a minimum period of 30 minutes, assuming that no special crew action is taken for 10 minutes, then a separate emergency supply, independent of the aircraft electrical generating system, which will automatically supply such an instrument and its associated lighting for a minimum period of 30 minutes, shall be provided.

2.2.1 Where the emergency supply is provided by a separate battery it is permissible for this battery to be (trickle) charged from the main electrical generating system,

provided that the installation is such that the battery cannot discharge back into the main system.

2.3 The instrument supplied in accordance with 2.2 shall be:-

a) the third instrument (standby horizon) where this is provided, or failing such provision.

b) the bank and pitch indicator fitted to the Captain's flight instrument panel.

2.3.1 Where the third instrument is fitted it shall:-

a) operate independently of any other attitude indicating system.

b) be so located on the instrument panel that it will be visible to, and usable by, both pilots from their normal positions.

c) be compatible in presentation with the main attitude indicating system.

d) be fitted with a failure warning device.

Alternatively, a means of indicating that the power supply to the instrument is operating correctly shall be provided.

2.3.2 Where the instrument on the Captain's flight instrument panel is utilized:-

a) The circuitry to the instrument shall be modified, as necessary, so that transfer to the emergency source of supply is automatically effected in the event of failure of the main supply.

b) The requirements of paragraph 2.3.1 (d) shall be met.

3 Additional Information

3.1 Commentators have suggested in the past that under conditions of widespread adverse weather, or heavy traffic density at airports, a period of 30 minutes may be a less than desirable time for flight to a suitable airfield and landing, and clearly this period by itself is inadequate for long range aircraft.

3.1.1 The basis of certification of all long range, and of certain short/medium range, aircraft types is that after a period of interruption of electrical supplies it will be possible for the crew to re-establish sufficient normal, or emergency, generated power to support all necessary essential services, including the instrument covered by this GR, for the remainder of the flight. The prescribed period of 30 minutes is considered to be adequate to allow for appropriate crew action for this class of aircraft.

3.1.2 For those shorter range aircraft that are totally dependent on battery power to support all essential services to the completion of the flight, a period of 30 minutes assuming a crew delay time of 10minutes, is the mandatory minimum endurance of the emergency supply for the horizon instrument prescribed in this Notice. It is, however, strongly recommended that in circumstances where the crew do take prompt and correct actions in response to warning indications of the interruption of an generated electrical power, the aircraft installation should include adequate battery capacity to provide a 60 minute supply for both the subject instrument and the other services essential to complete the flight and make a landing.

3.2 A number of aircraft types already comply with the requirements of this GR, or incorporate other special features which have been considered and accepted by the CAAM as providing an equivalent level of safety.

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5.3 Attachment C – GR No 03: Electrical Power Supplies for Aircraft Radio Systems

(Previously issued as Airworthiness Notice no. 25 issue 1 dated 1 Apr 1987)

1 Introduction

1.1 Previous Issues of Airworthiness Notice No. 25 drew attention to the dangers of operation of aircraft in which the entire radio installation was supplied via a single electrical feeder circuit, and stated that Certificates of Airworthiness would not be issued or renewed in respect of aircraft certificated in the Transport Category with such systems.

1.2 It is not intended that aircraft, for which compliance with the requirements of paragraph 2 of previous Issues of Airworthiness Notice No. 25 has been established, should be re-examined.

2 Requirement

2.1 The electrical feeder arrangements shall be such that—

a) Where more than one radio system is installed, no likely single failure (e.g. a fuse or a relay) will result in the loss of all radio systems.

Notes. –

1) It is strongly recommended that such a failure should only result in the loss of one radio systems.

2) The reference to radio system includes any associated audio system.

b) Where duplicate radio systems, or radio systems which can duplicate a function, are installed, no likely single failure (e.g. a fuse or a relay) will result in the loss of both systems.

3 Interpretation

3.1 In examining electrical feeder arrangements to establish compliance with paragraph 2, the examination for likely single failures should include—

a) The mechanical and electrical aspects of the supply circuit, including the return path of the electrical supply

b) The location within the electrical circuit of fuses, circuit breakers and power switching relays, their physical location in the aircraft and the manner in which they are interconnected; and

c) Panels for integrated control of radio systems, audio integration systems, and dimmer control equipment for electronic displays.

4 Implementation

4.1 Aircraft used for the purposes of public transport of passengers or cargo must comply with the requirements of paragraph 2.

4.2 Multi-engine aircraft used for any purpose must comply with the requirements of paragraph 2.

4.3 The CAAM will consider applications for a waiver to this requirement in respect of multi-engine aircraft that is not used for the purposes of public transport, when it can be satisfied that the aircraft is fitted with such limited radio equipment, or is restricted

to operations under such limited conditions, that the loss of the electrical supply to all radio equipment would not significantly affect the safety of the aircraft during its permitted normal operation.

5 Recommendation

5.1 It is strongly recommended that all single-engine aircraft (in addition to those for which compliance is required) should comply with the requirements of this requirement.

5.4 Attachment D – GR No 04: Tyre Burst In flight — Inflation Media

(Previously issued as Airworthiness Notice no. 30 issue 1 dated 1 Sept 1988)

1 Introduction

1.1 This requirement is applicable to all Malaysian registered aeroplanes with a Maximum Take-off Weight Authorised (MTWA) exceeding 5700 kg, with retractable landing gear.

1.2 The majority of in-flight tyre bursts have been attributed to the tyre carcass being weakened by foreign object damage, scuffing, etc., such that a rapid release of pressure takes place. Such failures are usually experienced when the gear has been retracted for some time and the effects of brake heat transfer, internal tyre temperature and differential pressure are combined.

1.3 A fatal accident involving cabin decompression and fire has highlighted another mode of tyre failure in flight where a tyre may fail explosively without any significant prior degradation. A tyre inflated with air and subjected to excessive heating, possibly caused by a dragging brake, can experience a chemical reaction resulting in release of volatile gases. Such a chemical reaction in the presence of the oxygen in the contained air may result in a tyre explosion in a landing gear bay and/or an in-flight fire since it appears that the protection normally afforded by conventional pressure relief devices in the wheel would be incapable of responding adequately to the rapid increases in temperature and gas pressure associated with auto-ignition.

1.4 Laboratory material and tyre burst testing indicates that the risk of auto-ignition can be reduced by using an inert gas for tyre inflation and servicing.

1.5 Other potential benefits may accrue from the use of Nitrogen as it will tend to reduce wheel corrosion, tyre fatigue and the risk of fire when fusible plugs melt due to brake overheating.

2 Compliance

2.1 With immediate effect, all braked wheels of retractable landing gear units on aeroplanes defined in paragraph 1.1 will be required to have tyres inflated with Nitrogen, or other suitable inert gas, and maintained such as to limit the Oxygen content of the compressed gases to not greater than 5% by volume.

2.2 To ensure compliance with this requirement suitable inflation and servicing procedures must be adopted in consultation with the airframe constructor. At airfields where suitable inert gases are not normally available it is acceptable to use air for inflation or servicing provided that a suitable entry is made in the technical log and that the tyre is re-inflated or serviced in accordance with the agreed procedure at the earliest opportunity or within 25 flight hours, whichever is the sooner.

3 Additional Information

3.1 In addition to compliance with the requirement of paragraph 2 above, tyre and wheel assemblies should be maintained such that greases, solvents, powders and rubber dust are excluded as far as practicable from within the inflation volume.

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5.5 Attachment E - GR No 05: Light Aircraft piston Engine Overhaul Periods

(Previously issued as Airworthiness Notice no. 35 issue 4 dated 1 Mar 2000)

1 Introduction

1.1 For the purposes of this requirement, a light aircraft piston engine means either:

a) an engine installed in an aircraft below 2730 kg MWTA or

b) a piston engine of 400 hp (298kW) or less

Note. – For the purpose of this GR, engine is defined to include those components and equipment necessary for satisfactory functioning and control. The propeller and its associated equipment are excluded except where agreed by CAAM in writing.

1.2 Normally, for a light aircraft piston engine, CAAM will accept the engine constructor's overhaul period recommendations, which have been promulgated under a system approved by the responsible airworthiness authority.

1.3 Some constructor's publications permit operation beyond the overhaul periods recommended, at the discretion of the owner/operator, if the condition of the engine shows it to be justified. In certain instances the recommended overhaul periods are associated with particular rates of engine utilization, service bulletin/modification configuration or types of operations. CAAM policy in respects of engines used in light aircraft is set out in paragraph 2.1 to 2.5 and in the attachments to this GR.

2 Requirement

2.1 Continuation in service shall be in accordance with paragraph 2.1.1 as qualified by subparagraph 2.1.1(a) to 2.1.1(c) as appropriate.

2.1.1 Engines may be operated to the hours between complete overhauls which have been recommended by the constructor and promulgated under a system approved by CAAM, provided they conform to the appropriate service bulletin/modification configurations and types of operation. All such overhaul period recommendations by the constructor constitute a recommended overhaul period for the purpose of this requirement, including recommendations by the constructor to reduced overhaul periods with particular types of operation or particular service bulletin/modification configurations.

a) Where any overhaul period recommendation is stated in terms of both operating time and calendar time limitations, an engine which becomes restricted initially by calendar limitation may continue in service until the operating time limitation is reached, subject to inspection in accordance with paragraph 2.1 at the calendar time limitation, and subsequently at 100 hours or yearly intervals, whichever occurs first, in order to assess its condition. Calendar time periods run from the date on which the appropriate release document was signed, by the manufacturer in the case of a new engine, or by the overhauler in the case of an overhauled engine, unless it can be established that the engine was adequately inhibited/stored up to the time of installation.

b) Engines which have completed the recommended overhaul period may continue in service for a further period of operation not exceeding 20% of the hours recommended, subject to the following:

1) Compliance being shown with the appropriate limitations specified in Attachment 1 to this requirement.

2) Compliance being shown with any Airworthiness Directive which requires compliance at engine overhaul, unless otherwise agreed by CAAM.

3) The engine must have been operated in an aircraft registered in Malaysia for a period of at least 200 hours immediately prior to completion of the engine constructor's overhaul period recommendation.

4) The engine being inspected in accordance with Attachment 1 to this requirement in order to assess its condition immediately prior to the increase, and subsequently at 100 hour or early intervals, whichever occurs first. For engines operated in crop spraying aircraft the inspection must be repeated at 50 hours intervals.

c) Engines installed on aircraft not exceeding 2730 kg issued not used for Commercial Air Transport or Aerial Work role and which have completed the 20% extension of paragraph 2.1.1(b) may continue in service indefinitely, subject to the following:

1) Compliance being shown with the appropriate limitations specified in Attachment 1 to this requirement.

2) The engine being inspected in accordance with Attachment 1 to this requirement in order to assess its condition before exceeding 120% of the recommended overhaul period and subsequently being inspected and reassessed at 100 hours or yearly intervals whichever occurs first.

2.1.2 In the event that the inspection referred to in paragraph 2.1.1(a), 2.1.1(b) and 2.1.1(c) results in rejection, the affected assembly, e.g. cylinder must be completely overhauled.

2.2 In no case shall any mandatory restrictions be exceeded, and the compliance with mandatory bulletins/modifications shall be completed at the specified times.

2.3 In the case of engines not incorporating all the service bulletins/modifications which would enable it to qualify currently for any recommended overhaul period as defined in paragraph 2.1 of this GR, or of engine types not included in the constructor's bulletins, a specific recommendation in writing must be sought from the constructor, and If this is not obtainable, application made to the CAAM.

2.4 For clarity, the requirements of paragraphs 2.1 are presented in tabular form in Attachment 2 of this GR.

3 **Procedure**

3.1 The following procedural requirements must be complied with:

a) a written request must be submitted to the CAAM for approval of any proposed time between overhauls (TBO) extension, irrespective of the certification category of the aircraft that the engine Is installed in.

b) engines must not be operated beyond the current approved TBO until CAAM has given written approval of the request, which will be notified to both operator and nominated maintenance organizations.

c) engines installed in aircraft certificated in the Commercial Air Transport or Aerial Work Categories will be limited to an extension of 20% only on the TBO approved by the CAAM. When the 20% increase in TBO has been fully utilised, continued operation of the aircraft in which the engine is installed will only be permitted for non-commercial air operators only.

d) All inspections associated with initial, and continuing, approval of the TBO extension must be certified by certifying staff with appropriate rating under an approved maintenance organisation.

Note. – Operators are reminded that the CAAM is only concerned with the airworthiness implications of TBO extensions. The assessment of cost-benefits in terms of extended life versus possibly high overhaul costs rest with the operator.

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Attachment 1 to GR No 05: Light Aircraft piston Engine Overhaul Periods

1. The concept of allowing engines to run beyond the constructer's recommended overhaul period depends upon the presumption that it is possible to check the condition of the engine by prescribed inspections carried out at defined intervals. It is not intended to provide a freedom to run until the engine fails. The validity of the concept depends on the ability of the inspections to give warning of impending failure and in many areas of the engine this ability exists. There are, however, some types of failure (e.g. crank shaft cracking, counterweight wear) for which predictive checks are not possible other than by strip inspection.

2. Information has been supplied by CAAM to assist in the identification of those engine components which service experience has shown to have running time limits beyond which it would not be reasonable to operate, i.e. components the failure of which are not susceptible to prior detection but which would result in either an unacceptably high failure rate or a hazardous failure. These components and the associated life limits are detailed in paragraph 5 of this Attachment 1 and further information will be added as it becomes available.

3. In assessing the suitability of any engine to continue in operation beyond the constructor's recommended overhaul period, the CAMO shall ensure the engine must not go beyond any life limits and conditions specified in this Attachment 1.

4. The CAAM is taking the unusual step, in allowing this system to be applied to piston engines in ‘private’ light aircraft, of proceeding without the agreement of all the constructors concerned. This does not imply that the CAAM considers it is better informed than the constructers. The CAAM has made its decision on the grounds of the effect on airworthiness only, whilst the constructors have probably taken into account economics and serviceability. The CAAM feels that the operator must make his own decisions on these other aspects.

5. **Limitations**

5.1 Rolls-Royce Gipsy Major Engines.

Prior to running beyond 120% of the constructor's recommended overhaul period, engines other than Major 10 and earlier marks incorporating modification 2385 (splined propeller attachment) must have the taper portion of the crankshaft sulfinuz treated by Modification 2690. In accordance with Rolls-Royce Technical News Sheet G 15, engines must not exceed an overhaul period of 1000 hours unless Modification 2495 is embodied.

5.2 Avco Lycoming Engines.

Nil.

5.3 Rolls-Royce Majors 0-240 Engines.

Nil.

5.4 Teledyne Continental Motors.

Nil.

6. Examination and checking of Engine

A number of items included in the normal scheduled maintenance of an engine may be repeated to determine the condition of an engine at the end of its normal overhaul period, and additional inspections may also be specified.

6.1 External Condition.

The engine should be examined externally for obvious faults such as a cracked crankcase, excessive play in the propeller shaft, overheating and corrosion, which would make it unacceptable for further use.

6.2 Internal Conditions.

Significant information concerning the internal condition of an engine may be obtained from an examination of the oil filters and magnetic plugs, for metal particle contamination. These checks may be sufficient to show that serious wear or breakdown has taken place and that the engine is unacceptable for further service.

6.3 Oil Consumption.

Since the oil consumption of an engine may have increased towards the end of its normal overhaul period, an accurate check of the consumption over the last 10 flying hours would show whether it is likely to exceed the maximum recommended by the constructor, should the overhaul period be extended.

6.4 Compression Check.

Piston ring and cylinder wear, and poor valve sealing could, in addition to increasing oil consumption, result in a significant loss of power. A cylinder compression check is a method of determining, without major disassembly, the standard of sealing provided by the valves and piston rings.

6.4.1 On engines with a small number of cylinders a simple compression check may be carried out by rotating the engine by hand and noting the resistance to rotation as each cylinder passes through its compression stroke. The check should normally be made shortly after running the engine while a film of oil remains on the rubbing surfaces, to assist sealing and prevent scoring the working parts. If this is not possible, the constructor may recommend that oil is introduced into each cylinder and the engine turned through a number of revolutions before making the test.

(a) This method may be used to determine serious loss of compression on a single cylinder or the difference between the compressions of individual cylinders, but may not accurately show a similar partial loss of compression on all the cylinders of an engine.

(b) An alternative method which will give a more accurate result is to fit a pressure gauge (reading up to 1400 kPa (200 lb./sq. in)) in place of one sparking plug in each cylinder in turn and note the reading as the piston passes through top dead centre (TDC) on the compression stroke.

6.4.2 Another method of carrying out a direct compression test is by use of a proprietary type compression tester equipped with a means of recording cylinder pressures on a graph card. One set of plugs should be removed immediately after an engine run, and the compression tester fitted to each cylinder in turn while rotating the engine by means of the starter motor. The effectiveness of combustion chamber sealing can be judged by assessment of the graph records obtained.

6.4.3 A further method of checking engine compression is the differential pressure test. In this test a regulated air supply (normally 560 kPa (80 lb./sq. in)) is applied to each cylinder in turn and a pressure gauge used to record the actual air pressure in the cylinder. Since some leakage will normally occur, cylinder pressure will usually be less than supply pressure and the difference will be an indication of the conditions of the piston rings and valves. By listening for escaping air at the carburettor intake, exhaust and crankcase breather, a defective component may be located. As while the previous tests, it is usually recommended that the differential pressure test is carried out as soon as possible after running the engine.

Note. - The crankshaft should be restrained during this test as, if the piston is not exactly at the end of its stroke, the test air pressure may be sufficient to cause rotation.

7. Power Output of Aeroplane Engines

The power developed by an aeroplane engine after initial installation is established in the form of a reference engine speed, which is recorded in the appropriate log book so that comparisons can be made during subsequent power checks. The reference engine speed is the observed engine speed obtained using specified power settings and operating conditions, corrected by means of graphs supplied by the engine constructer to the figure which would be obtained at standard sea-level atmospheric temperature and pressure; changes in humidity do not produce large changes in power and are ignored for the purpose of establishing a reference engine speed or subsequently checking engine power. Power checks should be carried out using the same power settings and operating conditions as when the reference engine speed was established, and should be corrected in the same way.

7.1 Power Checks.

The majority of light aeroplane piston engines are air-cooled and rely on an adequate flow of air for proper cooling of the cylinders. This condition can only be obtained during flight, and ground runs should, therefore, be as brief as possible. Cooling can be assisted by facing the aircraft into wind, but high wind conditions must be avoided when making power checks, as they will seriously affect the results obtained. Before running

the engine at high power the normal operating temperatures should be obtained (not the minimum temperatures specified for operation) and during the test careful watch should be kept on oil and cylinder temperatures to prevent the appropriate limitations being exceeded.

7.1.1 Normally-aspirated engines are tested at full throttle and, where a controllable-pitch propeller is fitted, with maximum fine pitch selected. The changes in barometric pressure affecting engine power are considered to be balanced by changes in propeller load, so that only a temperature correction is necessary. This correction factor may be obtained from a graph supplied by the engine constructor. The observed full throttle speed multiplied by the correction factor will give the corrected speed.

7.1.2 Although normally-aspirated engines are often fitted with variable-pitch propellers, the engine speed obtained at full throttle is usually less than the governed speed and the propeller remains in fully fine pitch. With supercharged engines, however, the propeller is usually constant speeding at high power settings and small changes in power will not affect engine speed. The power of a supercharged engine is therefore, checked by establishing a reference speed at prescribed power settings.

(a) Since a supercharged engine is run at a specified manifold pressure regardless of the atmospheric pressure, corrections must be made for both temperature and pressure variations from the standard atmosphere.

(b) The procedure is to run the engine until normal operating temperatures are obtained, open up to maximum take-off manifold pressure, decrease power until a fall in engine speed occurs (denoting that the propeller blades are on their fine pitch stops), then throttle back to the manifold pressure prescribed by the constructor and observe the engine speed obtained.

(c) The correction factor to be applied to the observed engine speed of a supercharged engine may be obtained from graphs supplied by the engine constructor.

7.1.3 Although the engine speed obtained during a check of engine power is corrected as necessary for atmospheric temperature and pressure, no correction is made for humidity, ambient wind conditions or instrument errors and, consequently, the corrected engine speed is seldom exactly equal to the reference speed even if engine condition is unchanged. However, engine power may usually be considered satisfactory if the corrected speed obtained during a power check is within 3% of the reference speed.

7.1.4 If it is not possible to assess power deterioration by means of power check (e.g. due to fitting a different propeller), a rate-of-climb flight test should be carried out.

8. **Power output of Helicopter Engines.**

The power developed by the engine of a single-engine helicopter is considered to be adequately checked during normal operations; any loss of power should be readily apparent. It is thus not considered necessary separately to check the power output of a helicopter engine specifically for the purpose of complying with this appendix.

9. **Power loss.**

If the power check (paragraph 7 of this Attachment) or normal engine operation reveal an unacceptable loss of power or rough running, it may be possible to rectify this by carrying out certain of the normal servicing operations or by replacement of components or equipment. The replacement of sparking plugs, resetting of tappets or magneto contact breaker points, or other adjustments to the ignition or carburetion systems, are all operations which may result in smoother running and improve engine power.

10. **Servicing.**

If the engine proves to be suitable for further service, then a number of servicing operations will normally be due, in accordance with the approved Maintenance Programme. Unless carried out previously (paragraph 9 of this Attachment) these operations should be completed before the engine is returned to service.

11. **Log Book Entries.**

A record of the checks made, and any rectification or servicing work, must be entered and certified in the engine log book before the engine is cleared to service for its recommended or extended life under the provisions of this Attachment.

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Attachment 2 GR to No 05: Light Aircraft piston Engine Overhaul Periods

<table>
<tr><th></th><th>Public transportation</th><th>General aviation</th></tr>
<tr><td>Normal Overhaul Period (operating hours)</td><td colspan="2">Constructor's recommended period provided the engine conforms to appropriate service bulletin/modification configuration and type of operation.

Note. – Engine which have both a constructor's calendar time and operating time limitation, and become restricted initially by calendar limitation may continue in service until operating time limitation subject to inspection (see paragraph 2.1 of this GR) at the calendar time limitation, and subsequently at 100 hour or yearly intervals, whichever occurs first.</td></tr>
<tr><td>Extension not exceeding 20% of normal overhaul period</td><td colspan="2">Compliance with Attachment 1 to this GR.

Compliance with any Airworthiness Directives

Inspections in accordance with paragraph 2.1 of this GR of completion of normal overhaul period and then at 100 hour or yearly intervals, whichever occurs first. (For engines operated in crop spraying aircraft the inspection must be repeated at 50 hours intervals).</td></tr>
<tr><td>Extension in excess of 20% of normal overhaul period (applicable only to aircraft not exceeding 2730 kg.)</td><td>No further extension unless the aircraft is not under the operation of Commercial Air Transport.</td><td>Engines may continue in service indefinitely subject to:

(a) Compliance with Attachment 1 to this requirement.

(b) Further inspection in accordance with paragraph 2.1 of this GR at 120% of the normal overhaul period and then at 100 hour or yearly intervals, whichever occurs first.</td></tr>
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5.6 Attachment F – GR No 06: Routine Maintenance of Propeller Blades

(Previously issued as Airworthiness Notice no. 36 issue 1 dated 1 Apr 1987)

1 Introduction

1.1 There have been occurrences where propeller blade tips have been dislodged during flight due to fatigue cracks as a result of inadequate and/or improper maintenance. Further investigation revealed that these cracks occurred because damages to propeller blades such as nicks, dents, gouges and corrosion had not received the recommended attention.

1.2 The consequences of not reworking significant blade damages, or neglecting the presence of surface corrosion, are such that airworthiness is impaired. The presence of corrosion, nicks and dents will produce undesirable stress concentrations which under continuous operating conditions can and will lead to blade failure. It is fundamental that maintenance personnel realise the fact that all assessments of the airworthiness of propellers from the fatigue aspect have been made assuming that the blades will be properly maintained.

2 Requirement

2.1 Propeller manufacturers have clearly defined, in the appropriate manuals, the type and extent of blade damages which do not requires rework until the next overhaul. Any damages exceeding such limitations must be reworked, in accordance with the manufacturer’s recommendations, prior to the next flight. Any evidence of corrosion must be treated in accordance with the manufacturer's recommended procedures.

3 Certification

3.1 Certificates of Airworthiness will cease to be in force under regulation 27 of CAR 2016 if the propeller blades have not received appropriate maintenance. Licensed Aircraft Engineers should not issue a Maintenance Release where it is obvious that propeller blade maintenance has been inadequate. In addition, CAAM may invalidate the Certificate of Airworthiness or reduce the time between overhauls (TBO) of a propeller if, in their professional opinion, deemed that the condition of a propeller indicates inadequate maintenance.

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5.7 Attachment G – GR No 07: Maintenance Requirements for Variable Pitch Propellers Installed on Aircraft Holding a Malaysian Certificate of Airworthiness

(Previously issued as Airworthiness Notice no. 37 issue 2 dated 1 Jul 1997)

1 Introduction

1.1 For most propeller types the propeller manufacturer will publish overhaul periods and any necessary maintenance inspection instructions which will be applied by the operator at the period specified unless varied by the Approved Maintenance Programme.

1.2 It has been recognised though that there are a few propeller types where the manufacturer has not published overhaul life in term of hours or calendar period. In order to ensure that these propellers are maintained in a satisfactory condition, the inspections are required to be applied at the period stated.

1.3 A situation also exists where, for low utilisation operation, the calendar period can be reached when the propeller has run only a small percentage of its operating hours limit. Under these circumstances, wear would not be expected to be a problem while degradation of seals and corrosion are more likely to exist. This requirement introduces an alternative maintenance policy which, subject to intermediate inspections, as specified in the requirement, will monitor the condition of the propeller such that it can operate beyond its calendar period to achieve its operating hourly limit.

1.4 Any overriding mandatory requirements in respect of particular propeller issued either by the Airworthiness Authority of the county of manufacture of a propeller, or by the CAAM will take precedence over this requirement. For the purposes of compliance with an AD which specifies requirement as a function of overhaul, the bare blade inspection required by paragraph 3.2(a) of this GR shall be deemed as overhaul.

1.5 This requirement is applicable to variable pitch propellers, variable pitch propellers which have been locked and to ground adjustable propellers.

2 Compliance

2.1 The maintenance policy defined in either paragraph 2.1(a) or (b) or (c) must be applied to all variable pitch and ground adjustable propellers.

a) Overhaul at the operating hours or calendar period recommended by the manufacturer, whichever occurs first, unless varied by the Approved Maintenance Programme.

b) The hub/blade and bare blade inspections specified in paragraph 3.2(a) and 3.2(b) of this requirement must be applied when:

1) No calendar or operating hours overhaul intervals are recommended by the manufacturer, or

2) Only operating hours intervals are recommended by the manufacturer with no associated calendar recommendation.

c) For a propeller fitted to an aircraft which has low utilisation, and for which the manufacturer has specified overhaul periods in term of operating and

calendar periods, the calendar life limitation only may be exceeded subject to hub/blade and bare blade inspections specified in paragraphs 3.2(a) and 3.2(b) of this requirement.

2.2 The periods of operation or elapsed calendar time prescribed in the tables to this requirement shall be calculated from the date of the initial installation of the propeller on an aircraft following manufacture or complete overhaul of the propeller and may be preceded by a period of storage of up to 2 years which has been carried out in accordance with the manufacturer's recommendations. Period of storage in exceeds of 2 years or subsequent to the installation shall be counted as if the propellers were installed.

2.3 The applicability and compliance to this GR are summarised in the Table 1 and Table 2 of this GR.

3 **Propeller Inspection**

3.1 The inspection required by Table 1 or Table 2 shall be undertaken by an organisation approved by the CAAM for the purpose.

3.2 The inspection and re-work shall be carried out in accordance with the manufacturer instructions and as minimum shall include:

a) Hub/blade inspection.

1) Dismantling of the propeller sufficiently to gain access to the blade root bearing assemblies.

2) Thorough cleaning of the blade root assemblies.

3) Examination for pilling, fretting, corrosion and other damage of the hub, bearings, blade roots, and housing, together with replacement of any disturbed seals. All of the blade surfaces shall be examined for damage, de-elimination (where applicable), and the presence of corrosion, removing the paint finish as necessary. In cases where de-icer boots or overshoes are installed on the blades, a detailed examination for corrosion around their edges shall be carried out, and, if any evidence is found, the boots/overshoes shall be removed in permit a full inspection of the masked areas. Any corrosion shall be removed, and the blades re-protected. In cases where de-icer boots/overshoes are removed, replacement parts shall be installed using the facilities prescribed and under the conditions and procedures specified in the relevant manufacturers Overhaul Manual.

4) Checking the track of the propeller after refitting, then functioning throughout its operational range by means of an engine run in verify correct performance and to establish that any vibration is within acceptance limits.

b) Bare blade inspections.

In addition to the hub/blade inspection ref, 3.2(a);

1) Removal of all de-icing boots or overshoes and fairings.

2) Removal of all paint and erosion protection.

3) Removal of all blades root, bushings and plugs.

4) Inspection of the complete blade surface for the presence of corrosion. Any corrosion shall be removed and the blades re-protected and prepared for the reinstallation of the blade fillings.

5) Full dimensional inspection of all blades.

4 Records of Accomplishment

4.1 A comprehensive record of the inspection and work done in accordance with paragraph 3 of this GR shall be prepared and retained and an entry, making a cross reference to this document, shall be inserted in the relevant Propeller Log Book. All such work and entries shall be certified by a duly authorised person, in the prescribed manner.

Table 1: Propellers fitted to Aircraft, MTWA above 5700 kg.

(a) Overhaul period	Whichever occurs first or operating hours of calendar period as published by the propeller manufacturer unless varied by the Approved Maintenance Programme.
(b) Overhaul period	Operating hours as published by the propeller manufacturer or on condition where no life has been published, subject to (i) an (ii) below
(i) Hub/ blade inspection period	Inspect at 3 years since new or overhaul or inspection (ii) below.
(ii) Hub/ blade inspection period	Not to exceed 6 years since new, overhaul or last bare blade inspection.

Table 2: Propellers fitted to Aircraft, MTWA below 5700 kg.

(a) Overhaul period	Whichever occurs first or operating hours of calendar period as published by the propeller manufacturer unless varied by the Approved Maintenance Programme.
(b) Overhaul period	Operating hours as published by the propeller manufacturer or on condition where no life has been published, subject to (i) an (ii) below
(i) Hub/ blade inspection period	Inspect at 3 years since new or overhaul or inspection (ii) below (but may be phased to next annual check or Certificate of Airworthiness Renewal provided period does not exceed 4 years)
(ii) Hub/ blade inspection period	Not to exceed 6 years since new, overhaul or last bare blade inspection.

Note. – Hub/blade inspections and bare blade inspections are to be in accordance with the procedures of paragraph 3 of this GR.

5.8 Attachment H – GR No 08: Maintenance of Cockpit and Cabin Combustion Heaters and Their Associated Exhaust Systems

(Previously issued as Airworthiness Notice no. 41 issue 1 dated 1 Apr 1987)

1 Introduction

1.1 Cases have occurred of fatal aircraft accidents where the associated investigations have revealed that the flight crew may have been suffering from carbon monoxide poisoning brought about by the gas escaping from combustion heaters or their associated exhaust systems.

Note. – Carbon monoxide (CO) a poisonous gas, is a product of incomplete combustion and is found in varying degrees in all smoke and fumes from burning carbonaceous substances. It is colourless, odourless and tasteless.

1.2 Fitment of oversize nozzles to combustion heaters will increase the concentration of carbon monoxide in the exhaust gases and may cause operating difficulties with the heater. Therefore, it is imperative that only nozzles of the type quoted by the manufacturer are fitted and that servicing, overhaul and inspection standards of combustion heaters and their associated exhaust systems are maintained at a high level.

2 Servicing and Overhaul

2.1 The requirements of this paragraph 2 are applicable to all aircraft whether maintained to an approved maintenance programme or not.

2.2 Except where otherwise agreed by the CAAM, servicing, overhaul and inspection of combustion heaters and their associated exhaust systems shall be in accordance with the instructions contained in the appropriate manuals produced by the aircraft constructor and the equipment manufacturer. If the instructions in the aircraft constructor's manual differ from those in the equipment manufacturer's manual, those of the aircraft constructor shall be assumed to be overriding.

2.3 In addition to compliance with the provisions of the approved maintenance programme and appropriate instructions, compliance shall (unless already accomplished in the course of aircraft maintenance) also be shown with (a) and (b), at intervals not exceeding 500 heater operating hours or two years, whichever is the sooner (but see paragraph 2.4).

a) Combustion heaters and their exhaust systems shall be completely dismantled, inspected and restored to the extent necessary to ensure continued safe operation. Combustion chambers shall, in addition, be pressure tested.

b) The hot air outlet ducting adjacent to the heater shall be inspected for exhaust contamination and the appropriate action shall be taken where there is any evidence of contamination.

2.4 Unless equipment which records heater operating hours is installed, it must be assumed that heater hours are equal to aircraft flying hours or some percentage of flying hours that has been agreed with the CAAM. Applications for the agreement of a flying hour percentage should be made to the CAAM.

3 Maintenance Programme Amendment

3.1 Appropriate amendments must be submitted by all holders of CAAM Approved Maintenance Programme affected by these revised requirements.

3.2 Proprietary carbon monoxide detectors are available. Whilst the use of such detectors may be an aid to the detection of carbon monoxide contamination in aircraft, their use is not considered to be a satisfactory substitute for the procedure detailed in this requirement.

5.9 Attachment I – GR No 09: Cotton, Linen and Synthetic Fabric-covered Aircraft

(Previously issued as Airworthiness Notice no. 49 issue 2 dated 1 Oct 2002)

1 Introduction

1.1 This contains requirements in respect of the issue or renewal of Certificates of Airworthiness applicable to aircraft, that have fabric covering. The fabric covering may be manufactured from natural materials such as linen or cotton, but also include other Aviation Approved fabrics produced from Polyester or Glass Fibre.

2 Structural Damage and Deterioration

2.1 Removal of the fabric covering of some older types of aircraft has revealed cases of unsuspected structural damage and deterioration. It is therefore important that during routine inspections, any sign of distortion, slackness, wrinkling or discoloration of the covering material is investigated ~and the cause established.

2.2 The use of good maintenance practices, incorporation of adequate correctly placed drain holes, regular cleaning and storage of the aircraft in a dry hangar will retard deterioration. Damage will be reduced by using proper ground handling techniques and equipment. Planned periodic inspections of aircraft coverings, structural elements and their attachments are essential in preventing damage and deterioration from going unnoticed.

2.3 Following incidents such as heavy landings, high "g" loadings, ground loops and collisions, the aircraft must be inspected to detect any hidden damage or distortion.

This may involve removal of the covering material or provision of access openings and may include inspections using Non Destructive Testing (NDT) techniques. Experience has shown that structures can appear undamaged until manually loaded during a physical check. Wherever possible, the manufacturer's inspection recommendations should be used. In the absence of specific guidance, refer to UK CAA CAP 562 Civil Aircraft Airworthiness Information and Procedures (CAAIP) and/or consult a specialist organization.

2.4 Details of the incident, inspections/repairs carried out should always be entered in the aircraft log book.

3 Fabric Coverings

3.1 Many factors can influence the life and condition of covering fabrics, such as, age, contamination, exposure to high humidity, ultra violet light, utilisation and type of operation for which the aircraft has been employed. The type of covering material used will also need to be ascertained as natural materials are much more susceptible to adverse climatic conditions than synthetic materials. However, the improved longevity of synthetic materials often means that internal structures are inspected much less frequently and deterioration can go undetected.

3.2 The airworthiness of covering fabrics should be assessed using a method acceptable to the CAAM, these being detailed in the Manufacturer's Airworthiness data or where appropriate UK CAA CAP 562 CAAIP Leaflet 51-150.

Note. – With suitable training and experience an engineer can usually assess the condition of fabric covering by its appearance, tension and reaction to thumb pressure. Failing this ability, a suitable type of fabric tester should be used. The tester

and its method of operation are described in UK CAA CAP 562 CAAIP Leaflet 51-150.

3.3 Cotton and linen fabrics may be replaced with synthetic materials providing they are of a type manufactured and approved for aeronautical use in their country of origin and acceptable to the aircraft manufacturer as an alternative covering material. Replacement materials must also be appropriate for the intended purpose having properties no less than the original fabric in terms of strength and durability. Application must be in accordance with the manufacturer's procedures with control surfaces re-balanced to the original limits specified. Rib stringing and other materials must have a compatible life expectancy to the replacement covering.

Note. – Care must be exercised when tautening synthetic fabric using the application of heat. Lightly built wooden structures covered with these materials can become distorted or crushed during the shrinking process. The application of non-tautening dope should be also considered in these cases.

3.4 The use of a replacement fabric must be covered by an approved modification, either from an appropriately CAAM approved design organisation or through CAAM as appropriate.

4 Certification Requirements

4.1 Certificates of Airworthiness

4.1.1 Certificates of Airworthiness will only be issued and may only be recommended for renewal in respect of used aircraft if the requirements of paragraph 4.1.2 and 4.1.3 have been complied with.

4.1.2 Certified evidence must be produced to show that an internal inspection sufficient to establish continued structural integrity has been carried out within the period specified in the applicable Maintenance Schedule. The depth of the inspection must be relative to the age of the aircraft, inspection history, known usage, storage conditions/hangarage and the elapsed time since the last full inspection. This should be determined by the certifying person using data from the organisation responsible for Type Design, a maintenance programme agreed by the CAAM and the guidance material contained in UK CAA CAP 562 CAAIP. Access holes may have to be cut to facilitate inspections and these reinforced in accordance with the manufacturer's requirements.

4.1.3 Certification of the inspections and work carried out must be made by an appropriately Licensed Aircraft Maintenance Engineer, operating under the approval granted to a Maintenance Organisation. Log book entries must be made in sufficient detail to provide an accurate record indicating the extent of the access, inspections carried out, repairs and overhauls performed and any recovering required since the last structural inspection including reference to the applicable modification approval.

4.2 Permits to Fly

4.2.1 Permits to Fly will only be issued and may only be recommended for renewal in respect of used aircraft if the requirements of paragraph 4.2.2 have been complied with.

4.2.2 At initial issue or the first annual inspection (as applicable), all fabric covered aircraft must be internally inspected to establish and suitably record their structural integrity. The depth of the inspection must be relative to the age of the aircraft, inspection history, known usage, storage conditions/hangarage and the elapsed time since the last full inspection. This must be certified by persons specifically authorised by the CAAM in order to qualify for issue or renewal of the Permit to Fly. Thereafter, inspections must be performed at a frequency not exceeding 3 years. Access holes may have to be cut to facilitate inspections and these reinforced in accordance with the design requirements.

4.2.3 Log book entries must be made in sufficient detail to provide an accurate record indicating the extent of the access, inspections carried out, repairs and overhauls performed and any re-covering required since the last structural inspection including reference to the applicable modification approval.

5 Guidance

5.1 Guidance material relating to fabric covered aircraft may be found in a number of publications which include:

CAA UK CAP 562 CAAIP Leaflet 51-150 Fabric Covering

CAA UK CAP 562 CAAIP Leaflet 51-160 Doping

CAA UK CAP 562 CAAIP Leaflet 51-10 Inspection of Wooden Structures

CAA UK CAP 562 CAAIP Leaflet 51-50 Inspection of Metal Aircraft Structures

CAA UK CAP 562 CAAIP Leaflet 51-120 Rigging checks on Aircraft

FAA AC 43.13 Acceptable Methods, Techniques and Practices

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5.10 Attachment J – GR No 10: Electrical Generation Systems – Bus-car Low Voltage Warning Single Engine Aircraft with Malaysian Certificate of Airworthiness

(Previously issued as Airworthiness Notice no. 72 issue 2 dated 1 Oct 2002)

1 **Introduction.**

1.1 Aircraft systems which were once fitted only in the more complicated twin-engine, general aviation aircraft, have now been developed and fitted to single engine aircraft. Thus, greater reliance is being placed on the integrity of the electrical power supplies for such aircraft.

1.2 The purpose of this GR is to extend the requirement for a clear and unmistakable warning of the loss of generated electrical power (to the main bus-bar) as detailed in paragraph 2.1. This will be by introduction, where necessary, of retrospective modifications.

2 **Requirements.**

2.1 For all single-engine aircraft with a Malaysian Certificate of Airworthiness equipped with an engine driven electrical generating system, compliance with paragraph 2.2 and 2.3, or with CAAM approved alternative providing an equivalent level of airworthiness is required not later than 01 July 1998.

2.1.1 Where an aircraft is equipped to operate under day visual meteorological conditions (VMC) conditions only and the loss of generated electrical power could not prejudice continued safe flight and landing, CAAM on application will waive this requirement, where it is satisfied that compliance would not be justified in the circumstances of a particular case.

2.2 A clear and unmistakable red visual warning shall be provided, within the pilot scan of vision, to give indication of the reduction of the voltage of the aircraft bus-bar to a level where the battery commences to support all or part of the electrical load of the aircraft.

2.3 Guidance shall be given to the appropriate aircraft manual(s) on any actions to be taken by the pilot should the warning operate. See also paragraph 3.2.

3 **Additional Information.**

3.1 The recommended voltage levels for operating the warning required under paragraph 2.2 of this requirement are 25 volts to 25.5 volts for a nominal 24 volts dc system and 12.5 volts to 13 volts for a nominal 12 volts dc system

3.2 The battery duration should be sufficient to make a safe landing and should be not less than 30 minutes, subject to the prompt completion of any drills. This duration need only a reasonable estimate and not necessarily calculated by a detailed electrical load analysis. However, when making this estimate, only 75% of the battery name-plate capacity should be considered as available because of loss of battery efficiency during service.

3.3 Owners and operators are recommended to contact the aircraft constructor or main agent for information regarding suitable means of compliance with this requirement.

3.4 Owners and operators may, on application, submit proposal for their means of compliance to CAAM for approval of the modification.

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5.11 Attachment K – GR No 11: Painting of Aircraft

(Previously issued as Airworthiness Notice no. 82 issue 1 dated 1 Oct 2002)

1 Introduction

1.1 This requirement is applicable to all Malaysian registered aircraft issued with a Certificate of Airworthiness.

1.2 Experience has shown that a greater degree of control has to be exercised over the painting of aircraft exteriors. The term painting in this context embraces the associated processes of stripping and such terms as refinishing and refurbishing.

2 Compliance

2.1 All aircraft defined in paragraph 1.1 which are to have their external finish substantially altered, shall comply with this requirement.

2.2 The CAMO or the Approved Maintenance Organisation must assess the proposed task for its airworthiness implication, taking into account the aircraft manufacturers published requirements and precautions in addition to the content of paragraph 5 of this requirement, and make a decision as to the need for a maintenance release. CAMO should consult their Approved Maintenance Organisation prior to making such a decision.

2.3 When a maintenance release is judged to be necessary, the signatory to the maintenance release will take responsibility for the whole process and should, therefore, assess the extent of the work to establish the need to:-

a) Carry out on-site supervision including stage inspections.

b) Brief the work force to avoid any airworthiness hazard, particularly where significant problems could be concealed by subsequent work processes

c) Ensure that any task carried out is adequately defined by documented process specification containing sufficient information to control the procedure.

d) Ensure that all necessary guidance material, including the aircraft manufacturers' published data and the paint manufacturers' instructions are provided.

e) Anticipate potential problems resulting from partial restoration which could mean additional paint weight in significant areas and the need for balancing of control surfaces.

f) Make provision to rectify any corrosion detected following paint removal.

g) Ensure the restoration of corrosion inhibiting compounds where washing or use of solvents or other paint removal techniques may have removed them in areas adjacent to those being repainted.

h) Determine the basic weight and corresponding centre of gravity position.

Note. – It may benefit the CAMO to anticipate any scheduled structural inspections including Non-Destructive Inspections, which could be better accomplished following the paint removal.

3 **Requirement**

3.1 When the need for a maintenance release has been judged necessary under paragraph 2 of this requirement, for an aircraft which has been externally painted or had some significant change to its finish, such paint removal and subsequent polishing, then a maintenance release must be issued upon completion of the process (see paragraph 5 of this GR).

4 **Certification of maintenance release**

4.1 CAAM will not grant specific approval for painting of aircraft. Therefore, specialist painting organizations will not be entitled to issue any certification in respect of the airworthiness status of an aircraft following painting, unless the organisation holds on appropriate CAAM Organisation Approval.

4.2 A licensed aircraft engineer holding the relevant Category 'B1' AML for the class of aircraft, with any Type Rating in the appropriate sub-paragraph of CAD 1801 has authority to issue a maintenance release for the satisfactory completion of the external finish.

5 **Additional Information**

5.1 Examples of likely damage and hazards that must be avoided include:-

a) Damage caused during preparation work which could adversely affect the structural integrity of the aircraft, such as:-

1) Reduction in fastener head size by uncontrolled use of power tools and abrasive media.

2) Surface scratching by use of paint scrapers.

3) Degrading of composite or plastic surfaces by abuse of particle blasting techniques.

4) Aluminium surface contamination by steel wool particles.

5) Use of incorrect chemical paint strippers.

b) Damage to transparencies, composites and sealants by solvent and paint removers, due to inadequate protection and/or the retention of these products in crevices.

c) Inadvertent deletion of placards and markings, failure to renew them, or failure to comply with the required specification for, e.g. Registration Marks, mandatory door markings and break in zone identification.

d) Blockage of vents, drains and other openings by debris, masking tape and residues of paint remover, paint or particle blast material. The possible ingress of water into fuel tanks through vent apertures or past filler cap seals when using high pressure hoses for washing down.

e) Loss of correct mass balance moments on flight control surfaces.

f) Uncontrolled variations to aircraft basic weight.

g) Variation to surface profile and aerodynamic smoothness at critical points such as surface leading edges, by the uncontrolled use of fillers or excessive paint thickness.

h) Inadequate knowledge of the manufacturers' finishing schemes for antennas and radomes.

i) For fabric coverings, special procedures which ensure proper adhesion and protection from the effects of ultra-violet light. Aggressive removal of the old finish may cause fabric damage. The exposed fabric should be assessed for its serviceability prior to refinishing. The advice published by the manufacturer of synthetic fabric would have to be made available and complied with in full as well as that of the aircraft manufacturer.

j) The effects of excessive paint thickness on the application of non-destructive testing techniques using eddy current and ultrasonic methods.

k) Jamming of flight control and landing gear mechanisms by preparation treatments and paint.

5.2 Examples of finishing work that would require the issue of a maintenance release:-

a) Complete repainting from bare metal or fabric, or over coating an existing finish.

b) Reversion from paint finish to polished metal.

c) Repainting or reversion to bare metal on flying control surfaces or supercritical lifting surfaces.

d) Extensive polishing of bare metal finish using abrasive polishes where skin thickness or fastener head dimensions are critical, particularly where polishing is to be a repetitive requirement.

e) Finishing of radomes, antennas and composite materials used in Primary and Secondary structure.

f) Painting in areas involving critical orifices or mandatory markings

g) Any alteration to the finish of Helicopter main rotor and tail rotor blades or any other critical parts.

Note – 1. It is not intended that the requirement for the issue of a maintenance release should include minor repairs to surface finish where airworthiness implications are minimal.

2. The above list of examples is not to be exhaustive.

5.3 It is recommended that aircraft issued with a Permit to Fly should be subject to the same principles of compliance with this requirement, although there is no legal requirement for the issue of a maintenance release.

5.4 Operators and maintenance organisations are reminded that the use of self-adhesive decals as an alternative to painting may totally preclude both visual and eddy current inspections. Operators and maintenance organisations need to address the impact on structural inspection tasks when using such decals and ensure that the aircraft maintenance programme requires their removal at the appropriate time.