Australian Government
Civil Aviation Safety Authority

Maintenance of Warbird, Historic and Replica aircraft

Civil Aviation Advisory Publication

June 2015

This Civil Aviation Advisory Publication (CAAP) provides guidance, interpretation and explanation on complying with the *Civil Aviation Regulations 1988* (CAR) or a Civil Aviation Order (CAO).

This CAAP provides advisory information to the aviation industry in support of a particular CAR or CAO. Ordinarily, the CAAP will provide additional 'how to' information not found in the source CAR, or elsewhere.

A CAAP is not intended to clarify the intent of a CAR, which must be clear from a reading of the regulation itself, nor may the CAAP contain mandatory requirements not contained in legislation.

Note: *Read this advisory publication in conjunction with the appropriate regulations/orders.*

This CAAP will be of interest to:

- owners, restorers and maintainers of warbird, historic and replica aircraft (WHR)
- organisations providing maintenance services on WHR.

Why this publication was written

This CAAP provides information and guidance about the amended provisions of CAO 104.0 and Directions Instrument number Civil Aviation Safety Authority (CASA) 03/15.

Status of this CAAP

This CAAP replaces CAAP 104-1(1) dated February 2015 and has been expanded to provide guidance for maintainers and maintenance organisation approval holders about:

- excluded type training
- training for maintenance
- certification of wood aircraft structures and fabric covered surfaces.

Changes to this CAAP are marked with shading.

For further information

For application and policy advice contact CASA's Approved Self-Administering Aviation Organisations (ASAO) Office (Telephone 131 757).

Contents

1. The relevant regulations and other references

- Civil Aviation Act *1988 (the Act)*
- Regulation 21.189 of the *Civil Aviation Safety Regulations 1998* (*CASR)* - Special certificate of airworthiness for limited category aircraft
- Part 42 of CASR – Continuing airworthiness requirements for aircraft and aeronautical products
- Part 45 of CASR – Display of nationality and registration marks and aircraft registration identification plates
- Subregulation 66.010 (1) of CASR
- Part 147 of CASR – Continuing airworthiness – maintenance training organisations
- Regulation 30 of CAR – Certificates of approval
- Regulation 33B of CAR – Airworthiness authorities
- Regulation 33D of CAR – Grant of aircraft welding authority
- Part 4A of CAR – Maintenance. Specifically:
  - Subregulation 42G (2) of CAR
  - Subregulation 42G (5) of CAR
  - Subregulation 42ZC (4) of CAR
  - Subregulation 42ZC (6) of CAR
  - Schedule 7 of CAR – Maintenance that must not be carried out on a Class B aircraft by a person referred to in paragraph 42ZC (4) (b)
  - Schedule 8 of CAR – Maintenance that may be carried out on a Class B aircraft by a pilot entitled to do so under Subregulation 42ZC (4).
- Civil Aviation Order (CAO) 104.0 – Certificates of approval – application, grant and conditions

- Directions Instrument – Maintenance on warbird and historic and replica aircraft (WHR) – directions and licence condition.

2. Acronyms

AMO	Approved Maintenance Organisation
ASAO	Approved Self-administering Aviation Organisation
AEL	Aircraft Engineer Licence
CAAP	Civil Aviation Advisory Publication
CAO	Civil Aviation Order
CAR	*Civil Aviation Regulations 1988*
CASA	Civil Aviation Safety Authority
CASR	*Civil Aviation Safety Regulations 1998*
CofA	Certificate of Airworthiness
COA	Certificate of Approval
LAME	Licensed Aircraft Maintenance Engineer
NDT	Non-Destructive Testing
WHR	Warbird, Historic and Replica Aircraft

3. Definitions

For the purpose of this publication, the following definitions apply:

AUTHORITY OR TYPE RATING HOLDER – A person who holds one or more of the following:

(a) an airworthiness authority under paragraph 33B (1) (a) of CAR to carry out maintenance on a WHR

(b) an airworthiness authority under paragraph 33B (1) (d) of CAR to conduct non-destructive testing (NDT) of aircraft and aircraft components

(c) an aircraft welding authority under subregulation 33D (1) of CAR

(d) an authorisation under subregulation 42ZC (6) of CAR to carry out maintenance for paragraph 42ZC (4) (e) of CAR

(e) a category B1 or B2 licence with a rating for a type rated aircraft type that is a WHR.

Note: Wherever reference is made to an authority or type rating holder in this CAAP, it means the holder of an authority or type rating which permits the particular type of maintenance under discussion.

CERTIFICATION AUTHORISATION – An authorisation that has been issued to an employee in accordance with the requirements of CAO 104, as described in section 5, 8 or 11 of this CAAP.

CERTIFICATE OF APPROVAL (COA) HOLDER – A person who holds a COA, under regulation 30 of CAR, for maintenance of aircraft, aircraft components or aircraft materials.

INDEPENDENT MAINTAINER – A person mentioned in paragraph 42ZC (4) (b) of CAR, being a person who holds a maintenance licence or an airworthiness authority and who is performing maintenance covered by that licence or authority independently of a COA holder.

QUALITY CONTROL MANUAL – The manual for a COA holder, as approved in writing by CASA, for the maintenance of aircraft in relation to training and assessment, and certification authorisation for the maintenance of aircraft, including a WHR (where applicable).

WHR – Means any of the following:

- an ex-armed forces (Warbird) aircraft, as described in subparagraph 21.189 (1) (a) (ii) of

CASR

- an historic aircraft, as mentioned in paragraph 21.189 (3) (a) of CASR
- a replica aircraft, as mentioned in paragraph 21.189 (3) (f) of CASR and issued with either of the following:
  i. a special certificate of airworthiness for limited category aircraft under regulation 21.189 of CASR
  ii. an experimental certificate for aircraft under subregulations 21.191 (d) or (e) of CASR.

WHR EMPLOYEE – An employee of a COA holder who is either of the following:

- a category B1 licence holder in a subcategory that is applicable to the WHR on which they propose to carry out maintenance
- a category B2 licence holder.

4. Background

4.1 Unless otherwise permitted under the regulations, the supervision and certification of aircraft maintenance may only be carried out by a person holding a:

- Part 66 Aircraft Engineer Licence (AEL) with the appropriate category and subcategory, or type rating (if applicable)
- CAR 33B Airworthiness Authority
- CAR 33D Welding Authority
- maintenance authorisation, issued under subregulation 42ZC (6) of CAR.

4.2 These authorities can generally be described as an authority for carrying out maintenance.

5. Excluded type maintenance (permitted training)

5.1 Why excluded type training?

5.1.1 Certain small aircraft have been classified as requiring type training and a type rating on the basis of the engine fitted to the aircraft. These aircraft are listed in the Part 66 Manual of Standards (MOS) as ‘small or non-rated aircraft (engine)’.

5.1.2 Part 147 approved courses of training for these aircraft (engine) types are, in many cases, unavailable due to insufficient demand for the course, or a lack of qualified trainers to provide the course. In order to accommodate industry needs, CASA has made provision for CAR 30 approval holders to conduct the necessary training and assessment in-house. In-house training and assessment carried out in accordance with the guidelines set out in CAO 104.0 and expanded in this CAAP, can lead to a licence outcome in the form of addition of a type rating or removal of an exclusion.

5.2 Excluded type training

5.2.1 The training must be given in accordance with procedures in a quality control manual approved for the purpose by CASA.

5.2.2 The training may be given as on-the-job training, which may be supplemented by classroom training or manufacturers training. Classroom training may also be provided by third party training providers, including but not limited to, Part 147 approved organisations.

5.3 Permitted trainers

5.3.1 Practical training must be given by employees or contractors who meet the experience requirements, namely that the person has held a maintenance licence in the appropriate category for at least 5 years and a rating for the particular aircraft or engine for at least 18 months. A person who holds, or has held, a CASA maintenance authorisation for the particular aircraft or engine for at least 5 years will be deemed to have met the requirements.

5.3.2 Formal training qualifications are desirable, however, the quality manager may approve a trainer who, in the quality managers assessment, is capable of successfully delivering the theory training and supervising the on-the-job training. The trainer must understand the way in which permitted training is given and how the required outcomes are measured and verified.

5.3.3 The training must cover the topics and tasks listed in the Part 66 MOS. Annex A of this CAAP contains a sample manual that can be modified to suit each operator's requirements.

5.4 Excluded type certification authorisation

5.4.1 In order to issue a certification authorisation, the Certificate of Approval (COA) holder must hold a CASA delegation under subregulation 42ZC (6) of CAR.

5.4.2 When the employee has successfully completed the training in accordance with the procedures set out in the Part 66 MOS, a once-only certification authorisation may be issued for a period of not more than 6 months.

5.4.3 The employer may give a notice of completion of training and assessment (in the approved form) to the employee and to CASA not earlier than 3 days before completion of the 6 month period.

5.4.4 The approved form for this purpose is currently under development, however, as an interim measure, email applications should be addressed to sport@casa.gov.au

5.4.5 Once notice of completion of training and assessment is provided, CASA will be able to consider removal of the relevant exclusion from the individual’s licence, or issue of the relevant rating.

5.4.6 In order to ensure a minimum delay between completion of the 6 month certification period and issue of the type rating or removal of the exclusion, the CAR 30 approval holder should send CASA a preliminary notice of completion at the end of 5 months. This will permit CASA licencing personnel some lead time to prepare the necessary documentation ahead of the notice of completion.

5.4.7 The CASA form for this purpose is Form 465 – Notification of Training Outcome.

6. WHR maintenance

6.1 Maintenance licensing under Part 66 of CASR does not generally cater for aircraft that have a special certificate of airworthiness (CofA), such as WHR. There are some exceptions such as the McD DC3 (PW R1830). CASA’s past practice has been to issue an individual maintenance authority under regulation 33B, or permission to carry out maintenance via subregulation 42ZC (6) of CAR. These interactions with CASA are unnecessary if an organisation has an approved training and authorisation system.

6.2 In order to provide a sustainable means of training and authorising WHR maintainers, CASA has introduced an in-house training and authorisation program for delivery by COA holders. In the longer term, CASA expects that a similar program will be continued for ASAOs under Part 149 of CASR.

6.3 CAO 104.0 sets out the requirements, procedures and limitations applicable to training that is provided in this manner and the authorisations resulting from that training. This CAAP describes the types of aircraft governed by the WHR provisions of CAO 104.0 (and associated Directions

Instrument), the training requirements for maintainers, and the scope and limitations that apply to authorisations granted under CAO 104.0.

6.4 Classifications of WHR

6.4.1 As set out in CAO 104.0, WHR are grouped into three classifications:

- **Part 1 WHR**: Those aircraft for which the maintenance provider is required to train and authorise B1 and B2 licence holders (WHR employees), in accordance with a procedure approved by CASA. Authority or type rating holders do not need extra training for the relevant Part 1 WHR, but still require a certification authorisation in accordance with the authorisation procedure described in section 8 of this CAAP. WHR employees require training, assessment and authorisation by the COA holder.
- COA holders are not required to hold a 42ZC (6) delegation for the purpose of authorising an authority or type rating holder.
- **Part 2 WHR:** Those aircraft that may be maintained, without special training and authorisation, by a WHR employee or by an authority or type rating holder.
- **Unspecified WHR:** Those aircraft that have not been classified as either Part 1 WHR or Part 2 WHR.

6.4.2 Part 1 WHR and Part 2 WHR groupings are listed at in Tables 1 and 2 at Appendix 3 of CAO 104. For ease of reference, these tables are reproduced at Appendix 1 of this CAAP.

7. Maintenance requirements

7.1 Part 1 WHR

7.1.1 Due to the complexity or irregularity of these aircraft, all maintenance (except unscheduled field maintenance) must be performed under the control of a COA holder whose certificate of approval covers the work. The work must be carried out or supervised by a specially trained category B1/B2 Part 66 AEL holder (trained WHR employee) or an authority or type rating holder.

7.1.2 The person certifying for the maintenance must hold a certification authorisation as described in section 8 of this CAAP, which permits certification on behalf of the COA holder for maintenance carried out on a particular aircraft.

7.1.3 The CASA issued authorities and type ratings remain subject to any specified condition or limitation that is on or attached to the authorisation.

7.1.4 An independent maintainer may perform any unscheduled maintenance that is not listed in Schedule 7 of CAR.

7.2 Exemption for current Part 1 maintainers

7.2.1 Paragraph 8AA.5 of the CAO 104.0 states:

> In spite of paragraph 8AA.4, a category B1 or B2 licence holder who carried out Part 1 WHR maintenance on an aircraft not more than 2 years before subsection 8 takes effect may continue to carry out such maintenance.

7.2.2 This means that a maintainer who is currently maintaining aircraft under their licence, which have been subsequently classified as Part 1 WHR aircraft under CAO 104, may continue to maintain the aircraft without training or assessment. The COA holder is not required to hold a 42ZC (6) delegation in order to authorise an employee to continue making the certifications.

7.3 Part 2 WHR

7.3.1 This class of aircraft may be maintained by either:

- a WHR employee
- a holder of an authorisation issued under Regulation 33B or paragraph 42ZC(6)
- an AME licence holder where the licence covers the class of aircraft.

7.3.2 As per Part 1 WHR, other authorisations for maintenance (i.e. airworthiness authority for maintenance or NDT, welding authority and 42ZC (6) authorisation) are unaffected by CAO 104.0 and the Directions Instrument.

7.3.3 An independent maintainer may perform any maintenance that is not listed in Schedule 7 of CAR.

7.3.4 All maintenance listed in Schedule 7 of CAR must be controlled by a COA holder whose approval covers the type of maintenance being performed. Additionally, the work must be supervised and certified by a person whose licence or maintenance authority covers the type of maintenance being performed.

7.4 Unspecified WHR

7.4.1 If a WHR has not been listed as a Part 1 or 2 WHR, and it has a turbine engine, then that WHR is treated as a Part 1 aircraft due to the specialised maintenance training required to safely maintain the engines. In the majority of cases, piston engined aircraft will be treated as Part 2 aircraft, with the exception of very complex large aircraft, such as the Lockheed Constellation; or aircraft that have a mixture of piston and turbine engine types, such as the Neptune.

7.4.2 If a turbine powered WHR is not listed in Part 1 or Part 2 of Appendix 3 to CAO 104.0, then it must be maintained as if it were a Part 1 WHR, until such time as it is classified otherwise within Appendix 1 or 2 of CAO 104.0.

7.4.3 If a person modifies an aircraft that is listed in Part 2 by installing a turbine engine, the aircraft ceases to be a Part 2 aircraft and is treated thereafter by the CAO as an unlisted turbine powered aircraft which is for all practical purposes a Part 1 aircraft.

7.5 Field maintenance by an independent engineer on Part 1 WHR

7.5.1 Unscheduled field maintenance not listed in Schedule 7 of CAR may be carried out on a Part 1 or Part 2 WHR, at any location in order to allow retrieval of an aircraft that has become unserviceable away from home base.

7.5.2 The COA holder or registered operator of the aircraft must give the independent engineer permission to carry out the maintenance. The engineer must hold a licence in the appropriate category and subcategory, where applicable.

7.5.3 The independent engineer providing the maintenance is not required to be an employee of a COA holder and is not required to have been specifically trained and authorised in the particular aircraft type in accordance with section 8 of CAO 104.0. The independent engineer will, however, need to ensure that they have sufficient data, knowledge and experience to perform the work safely.

7.6 Pilot maintenance schedule

7.6.1 Maintenance, carried out in accordance with Schedule 8 of CAR, is unaffected by the provisions of CAO 104.0 and the associated Directions Instrument.

7.6.2 The permission that category B1/B2 Part 66 AEL holders have been granted to carry out Schedule 8 of CAR (pilot) maintenance (a separate instrument issued by CASA) is also unaffected.

8. Training and assessment for Part 1 WHR maintenance

8.1 A COA holder may submit a Part 1 WHR training plan to CASA for approval. Once approved, the organisation should include the training plan with their quality control manual. The training plan must not be varied without CASA's approval.

8.2 WHR training plan requirements

8.2.1 The requirements for a training plan should not be confused with the requirements for a Part 147 maintenance training organisation. The plan is primarily intended to provide an outline of how the COA holder is going to provide the training to ensure that the employee has attained the necessary knowledge and skills required to perform or supervise maintenance on a particular aircraft. (Refer to Annex A of this CAAP for the sample manual).

8.2.2 The training plan does not need to include matters that are common to other aircraft classes. Rather, the plan should focus on the following elements that are unique to the particular aircraft:

- systems
- fits and tolerances
- techniques
- special tools
- processes.

8.2.3 Training may be delivered through on-the-job training or a combination of on-the-job and training delivered by an approved maintenance training organisation (recognised under Part 147 of CASR) or by a factory trained specialist (if available).

8.2.4 The training plan must describe in simple terms, the training objectives and outcomes, and a process for assessing Licensed Aircraft Maintenance Engineer (LAME) competence. The plan must also identify the person(s) responsible for managing the training and assessment program.

8.2.5 Recognition of prior learning processes may be employed by the COA holder to the extent the processes are described within the quality control manual.

8.2.6 The person providing the training is not required to hold formal training and assessment qualifications, but must be a person with demonstrated technical knowledge relevant to the aircraft. A person with demonstrated technical knowledge could be an authority or type rating holder; or another person who has been trained and authorised by the COA holder under the provisions of CAO 104.0.

8.2.7 If a person holds a Part 1 WHR certification authorisation issued by a COA holder, and is subsequently employed by another COA holder who has an approved training and assessment plan, the new employer will only need to train and assess the person to the extent necessary to be satisfied that the person has the requisite knowledge and skills as described in the new employers training objectives and outcomes statement.

8.3 Sample training plan

8.3.1 A sample manual can be found at Annex A of this CAAP. Section 6 of the Annex sets out the guidelines for a procedures manual that will meet the CAO 104.0 training requirements for the purpose of authorising Part 1 maintenance and certification.

8.3.2 When an employee of a COA holder has completed the WHR training and successfully met the assessment requirements set by the training plan, the COA holder must provide the employee with a notice of successful completion of training and assessment.

8.3.3 The COA holder is required to retain a record of all employees who have been trained and authorised under these provisions. The record for each employee must be retained for at least two years after the employee ceases to be employed with the COA holder.

8.4 WHR certification authorisations

8.4.1 An authority or type rating holder is deemed to have met the training requirements of Section 8 of CAO 104.0 and may be issued with a certification authorisation without undergoing an approved course of training. A COA holder does not require a 42ZC (6) delegation for this purpose.

8.4.2 Before issuing or re-issuing a certification authorisation to a trained WHR employee, the COA holder must be a CASA delegate for the purpose of authorising a person to carry out and certify maintenance on Part 1 WHR.

8.4.3 An authority or type rating holder may only act on behalf of a COA holder to certify maintenance carried out on a Part 1 WHR if the employee has been issued with a written certification authorisation for the purpose. The authorisation must set out the certifications that the employee is authorised to make on the COA holder's behalf.

8.4.4 The WHR to which the certification authorisation relates must be covered by a B1 or B2 Part 66 AEL, or CASA-issued authorisation for maintenance.

8.4.5 A certification authorisation may only be issued for a maximum period of two years. When an authorisation expires, the COA holder must assess the employee for the required levels of competency before re-issuing the certification authorisation. An employee who holds a CASA issued authorisation for maintenance other than an AEL, does not require re-assessment before their certification authorisation may be renewed, as CASA provides this function as part of CASA's renewal process. An issue or renewal of an authorisation must be notified to the employee in writing.

9. Independent inspection

9.1 A person carrying out independent inspection of a flight control system, in accordance with subregulation 42G (2) of CAR, does not have to have been trained, assessed or authorised in accordance with section 8 of CAO 104.0, if that person meets at least one of the criteria detailed in subregulation 42G (5) of CAR.

10. Points to remember

10.1 With the exception of field maintenance, Part 1 WHR may only be maintained by a COA holder whose approval includes the type of WHR aircraft.

10.2 Part 1 WHR maintenance certifications may only be made by an employee of a COA holder who holds a certification authorisation issued by that COA holder. The employee must also meet one of the following criteria:

- hold an authority or type rating that covers maintenance of the particular aircraft
- unless the exemption clause at Paragraph 8AA.5 of the CAO 104.0 applies, the employee must be a category B1/B2 Part 66 AEL holder, who has been trained in the maintenance of the particular aircraft and authorised by the COA holder to conduct that maintenance.

10.3 Part 1 WHR

10.3.1 A B1/B2 Part 66 AEL holder (WHR employee) may be trained and assessed for the purpose of performing and certifying maintenance (on a Part 1 WHR) if the maintenance falls within the scope of their category B1 or B2 licence.

10.3.2 A B1/B2 Part 66 AEL holder (WHR employee) who has been maintaining and certifying a WHR aircraft that has subsequently been designated as a Part 1 aircraft under CAO 104, may be issued a certification authorisation as if the person has been trained and assessed provided that not more than 2 years have elapsed since the person had last performed maintenance and certification of the aircraft.

10.3.3 WHR employees are not required to be trained on a WHR that is also a type rated aircraft if the LAME has the type rating on their licence or holds an authorisation issued under regulation 33B or subregulation 42ZC (6) of CAR.

10.3.4 A COA holder must not issue a certification authorisation in relation to a Part 1 WHR to a trained WHR employee unless the COA holder is the holder of a delegation under subregulation 42ZC (6) of CAR for this purpose.

10.3.5 A COA holder with a delegation under subregulation 42ZC (6) of CAR for this purpose and an approved WHR quality system may train, assess and authorise WHR employees to permit them to carry out Part 1 WHR maintenance.

10.3.6 An independent maintainer may carry out unscheduled maintenance on a Part 1 WHR at any location, in order to allow the aircraft to be returned to its home base provided that the maintenance is not listed within Schedule 7 of CAR.

10.3.7 Furthermore, an independent maintainer is not required to be specifically trained and authorised by a COA holder to carry out unscheduled maintenance on an affected WHR. The intent of this provision is to ensure that the operator of an aircraft that develops an unserviceability away from home base, is able to call upon the services of a local LAME (if available) to get the aircraft home.

10.3.8 For the purpose of paragraph 8.9 of CAO 104.0, the supervised performance of maintenance tasks during training is not deemed to be carrying out maintenance by the person undergoing training.

10.4 Part 2 WHR

10.4.1 Maintenance certifications for Part 2 WHR may be issued by a LAME whose licence subcategory is applicable to the aircraft being maintained, or by the holder of a CASA-issued authorisation for maintenance of the aircraft.

10.4.2 A COA holder is not required to issue its employees with certification authorisations for Part 2 aircraft.

10.4.3 A B1 or B2 AEL holder does not need to be trained and assessed to carry out maintenance on Part 2 WHR.

10.4.4 An independent maintainer may carry out any maintenance on a Part 2 WHR, so long as Schedule 7 of CAR does not stipulate that the maintenance must be carried out under the control of a COA holder.

11. Wood and fabric authorisation

11.1.1 CASA has made provision using Section 10 of CAO 104.0 for training and authorising employees to maintain and certify wooden aircraft structures and fabric covering services.

11.1.2 The administrative requirements are similar to the requirements for excluded type training and the salient features are listed below.

11.1.3 Training is intended to be provided in an on-the-job, and where necessary, supplementary classroom training format. When the training, assessment and authorisation period are completed in accordance with the guidelines in CAO 104.0 and expanded in this CAAP, a licence outcome can result in the form of removal of one or more exclusions.

11.1.4 Training must be provided by a person who has demonstrated expertise in the type of maintenance (wood structures or fabric surfaces) for which training is to be given. A person who holds a Part 66 licence that includes wood or fabric maintenance is acceptable provided that the person has performed wood or fabric maintenance for at least 5 years. Additionally, a person who has provided training in wood or fabric aircraft maintenance in a CASA approved maintenance training organisation (Part 147 of CASR or regulation 30 of CAR) may provide the training.

11.1.5 In order to be issued a certification authorisation, the employee must hold a Part 66 licence in the appropriate sub category. For example, a B1.1, B1.3 or B2 licence is unlikely to be relevant to wood structures or fabric coverings.

11.1.6 Before issuing a maintenance authorisation for wood or fabric maintenance, the COA holder must hold an approval that covers the scope of the maintenance in which training is to be given and be either:

- a CASA delegate for subregulation 42ZC (6) of CAR, who may authorise a person for paragraph 42ZC (3) (d) or (4) (e) of CAR (as the case requires)

  or

- an authorised person for subregulation 42ZC (7) of CAR, who may authorise a person for paragraph 42ZC (3) (d) of CAR.

11.1.7 In either case, the delegation or authorisation must be issued for the purpose of authorising the particular maintenance.

11.1.8 Upon completion of training, a maintenance authorisation may only be issued for 6 months and is not renewable.

11.1.9 At the completion of training and when the employee has completed the 6 months of carrying out maintenance and providing certifications for wood and or fabric covered aircraft (the authorisation period), CASA may remove the exclusion from a licence.

11.1.10 For removal of the exclusion, the COA holder must notify CASA not earlier than 3 days before completion of the authorisation period in the approved form that the employee has completed the training and authorisation period.

11.1.11 In order to expedite the process, an employer may, after at least 5 months of the authorisation period have elapsed, provide CASA and the employee with a provisional notice in the approved form of satisfactory completion of training and assessment. The preliminary notice may be sent to CASA electronically, to an address which will be provided by CASA for the purpose.

11.1.12 CASA Form 465 – Notification of Training Outcomes is the form used to notify CASA that an employee has completed the required training and certification period.

Executive Manager
Standards Division

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APPENDIX 1 – List of WHR

Part 1 WHR

Aircraft		Licence Categories	Suggested identification for a certification authorisation
Airframe	**Engine type**		
Aero Vodochody L 29 Delphin	Motorlet M-701C 500	B1.1; B2	L29
Aero Vodochody L 39 Albatross	Ivchenko AI-25TL	B1.1; B2	L 39
BAC Jet Provost	A-S Viper	B1.1; B2	Jet Provost
BAC Strikemaster	Rolls-Royce Viper Mk.535 turbojet	B1.1; B2	Strikemaster
Bell Cobra	Lycoming T53-L-13	B1.3; B2	AH-1G
Bell Iroquois Huey	Lycoming T53-L-11	B1.3; B2	UH series
CAC Sabre	RR Avon	B1.1; B2	Sabre
Cessna Dragonfly	General Electric J85-GE-17A	B1.1; B2	Dragonfly
DH 115 Vampire	DH Goblin	B1.1; B2	DH115
English Electric /Handley Page Canberra	RR Avon	B1.1; B2	Canberra
Folland Gnat	BS Orpheus	B1.1; B2	Gnat
Fouga CM 170 Magister	Turbomeca Marbore	B1.1; B2	CM 170
Gloster Meteor	RR Derwent	B1.1; B2	Meteor
Hawker Hunter	RR Avon	B1.1; B2	Hunter
Lockheed C121 Constellation	Wright R 3350-DA3	B1.2; B2	Constellation
Lockheed P2v Neptune	Wright R 3350 and Westinghouse J 34	B1.1; B1.2; B2	Neptune
Mikoyan Mig 15	Klimov VK 1	B1.1; B2	Mig 15
Mikoyan Mig 17	Klimov VK-1F	B1.1; B2	Mig 17
Mikoyan Mig 21	Tumansky	B1.1; B2	Mig 21
Savoia Marchetti S211	P&W JT15D-4C	B1.1; B2	S211
Soko Galeb	A-S/RR Viper	B1.1; B2	Galeb
TS-11 Iskra	WSK SO-3 or A-S Viper	B1.1; B2	TS-11

Notes:

1. Only the holder of a CASA issued authorisation for maintenance or a specially trained LAME, holding a current certification authorisation, may carry out scheduled and unscheduled maintenance on these aircraft. An independent engineer (not specifically trained and authorised) may only perform maintenance certification for unscheduled maintenance on these aircraft that is not specified in Schedule 7 of CAR.
2. The 'Suggested identification for a certification authorisation' (if any) mentioned in column 3 of Table 1 refers to a suggested means of identifying certification authorisations for CAO 104.0.

Part 2 WHR

Aircraft		Licence categories
Airframe	**Engine type**	
Aermacchi AM-3 Bosbok	Lycoming	B1.2; B2
AESL CT4/CT6	Cont IO-360	B1.2; B2
Antonov AN2 Colt	Shvetsov	B1.2; B2
Auster series	Piston (various types)	B1.2; B2
Bell 47	Lycoming	B1.4; B2
Beech 18	PW R 985	B1.2; B2
BA/Klemm Eagle	Gypsy Major	B1.2; B2
BA/Klemm L-25 Swallow	Continental	B1.2; B2
CAC Boomerang	P&W R-1830	B1.2; B2
CAC Mustang	RR/Packard Merlin	B1.2; B2
CAC Winjeel	P&W R-985	B1.2; B2
CAC Wirraway	P&W R-1340	B1.2; B2
Cessna O2A/B	Cont. IO-360	B1.2; B2
Cessna L19/305 Bird Dog	Cont. O-470	B1.2; B2
Cessna 100, 200, series	Piston (various types)	B1.2; B2
Comper Swift	Pobjoy/Gypsy Major	B1.2; B2
Consolidated Catalina	PW R-1830	B1.2; B2
Convair CV340	R-2800	B1.2; B2
Curtis P 40	Allison V-1710 RR/Packard Merlin	B1.2; B2
DH 84 Dragon	Gypsy Major	B1.2; B2
DH 89 Dragon Rapide	Gyspy 6	B1.2; B2
DH 83 Fox Moth	Gypsy	B1.2; B2
DH 60 Moth	Gypsy	B1.2; B2
DH 82 Tiger Moth	Gypsy Major	B1.2; B2
DH 94 Moth Minor	Gypsy Minor	B1.2; B2
DHA3 Drover	Gypsy Major	B1.2; B2
DHC1 Chipmunk	Piston (various types)	B1.2; B2
DHC 4 Caribou	PW R-2800	B1.2; B2
Douglas A-26/ B- 26 Attacker/Invader	PW R-2800	B1.2; B2
Douglas C47/DC3	PWR-1830/ Wright R-1820	B1.2; B2
Douglas DC4	PW R-2000	B1.2; B2
Extra 300L	Lycoming AEIO 540	B1.2; B2
Fiat G59	RR/Packard Merlin	B1.2; B2
Grumman Avenger	Wright R-2600	B1.2; B2
Grumman S2 Tracker	Wright R-1820	B1.2; B2
Hawker Sea Fury	Bristol Centaurus	B1.2; B2
Lockheed Hudson	Wright R-1820	B1.2; B2
Nanchang CJ 6	Zhouzhou	B1.2; B2
North American Mustang	RR/Packard Merlin	B1.2; B2
North American T28	Wright R-1820	B1.2; B2
North American T6/SNJ/Harvard	P&W R-1340	B1.2; B2
Percival Provost Mk1	Alvis Leonides	B1.2; B2
Piper Cub series	Piston (various types)	B1.2; B2
PZL Wilga	Ivchenko	B1.2; B2
Ryan (all)	Gypsy Major, Kinner, Menasco Pirate.	B1.2; B2
Short Scion	Pobjoy	B1.2; B2
Supermarine Spitfire	RR/Packard Merlin	B1.2; B2
Taylorcraft	Piston (various types)	B1.2; B2

Aircraft		Licence categories
Airframe	**Engine type**	
Vought /Goodyear Corsair (all variants)	P&W R2800	B1.2; B2
Vultee BT 13	P&W R-985	B1.2; B2
Yakovlev Yak -18A/Yak -18T	Vedeneyev	B1.2; B2
Yakovlev Yak 50	Klimov	B1.2; B2
Yakovlev Yak 52	Vedeneyev	B1.2; B2

Notes:

1. A Class B aircraft for which a standard CofA has been issued is subject to Part 4A of CAR, regardless of whether it is eligible for a special CofA in the limited category.
2. The holder of a CASA-issued authorisation for maintenance, B1/B2 employees and independent engineers (whether specifically trained or not) may carry out maintenance and provide maintenance certifications on these aircraft. A current certification authorisation is not required for these aircraft.
3. All turbine powered WHR aircraft will be classified as Part 1. If a Part 2 WHR is modified by installation of a turbine engine, it must be treated as a Part 1 aircraft and may only be certified on behalf of a CAR 30 approval holder, by a person who holds a certification authorisation.

ANNEX A - Also available on the CASA website in word format

Australian Government

Civil Aviation Safety Authority

ANNEX A TO CAAP 104-01(1.1)

SAMPLE

CAO 104.0 Manual

V1.1 - June 2015

Disclaimer

This manual template has been prepared to guide and assist Certificate of Approval (COA) holders who propose to train and authorise maintenance certification staff under the provisions of Civil Aviation Order (CAO) 104.0. The procedures and training plans that are set out in this manual represent the minimum acceptable standards that are required in order to satisfy the requirements set out in CAO 104.0.

It is not a prerequisite that this manual must be used in order to obtain an approval to authorise certification staff; however, the training outcomes specified in each section of this manual must be met or exceeded for each particular aircraft or system for which training is to be given.

An applicant for approval under CAO 104.0 may use any form of manual that suits the particular COA holder provided that these minimum requirements are incorporated into that manual.

How to use this manual

This manual is made up of six general and four training topics:

General

- **Sections 1 to 5** – describe the general administration and management processes applicable to the training procedures
- **Section 10** – provides practical performance assessment guidelines for use within each of sections 6, 7, 8 and 9.

Training

- **Section 6** – describes the procedures for training and authorising warbirds, historic and replica aircraft (WHR) employees
- **Section 7** – describes procedures for training and authorising certain excluded type employees
- **Sections 8 and 9** – describe the procedures for training and authorising excluded system employees in wood aircraft structures and/or fabric coverings.
- If you do not wish to use the full scope of the training manual, you may delete one or more of sections 6, 7, 8 and 9. However, if you propose to use this manual in part or in its entirety, then you should read the manual carefully and ensure that you are able to incorporate the chosen sections into your organisational procedures. Once approved, you will be required by regulation 11.077 of *the Civil Aviation Safety Regulations 1998* (CASR) to comply with the manual. Therefore, you should ensure that it is specific to your operations, not just a generic manual with your name on the cover page.

Important note: When assessing an application for a delegation under subregulation 42ZC (6) of *Civil Aviation Regulation 1988* (CAR) Civil Aviation Safety Authority (CASA) will refuse the application if the manual does not meet these minimum requirements.

Wherever a blank space appears, you will be required to ensure that you insert the appropriate information. Depending on context, the required information may be any of the following:

- your name or the name that is shown on your COA
- your Aviation Reference Number (ARN)
- the identifying details of an aircraft as shown in the Part 66 Manual of Standards (MOS)
- the name of the person responsible for managing the training program
- the name of an employee under training.

If a phrase, position name or title is shown with multiple options (e.g. Training/Quality Manager) you should remove all but the correct option for your organisation. If the position is held under a different title in your organisation - use that title.

1 Applicability statement and responsible manager certification

This manual has been generated to meet CASA Civil Aviation Order (CAO) 104.0 requirements for the purpose of providing maintenance training and issuing certification authorisations.

This manual sets out the procedures and assessment guidelines for the issue of certification authorisations that will be followed by ……. working under the COA number……..

This manual forms part of the …….. Quality and Procedures Manual, as accepted by CASA. Amendments to this manual will only be made by the Training/Quality Manager, in accordance with the procedures set out in this manual.

Authorised by (signature): …… Training/Quality Manager *(delete whichever does not apply)*

Date Revision: 1.0

2 Distribution List

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2.2 Amendment Record

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3 Introduction

This document sets out the procedures, processes and documentation that will be followed for the purpose of training maintenance personnel in the maintenance of excluded aircraft systems, excluded aircraft types or WHR Part 1 aircraft as described under Section 5, 6, 8 or 10 of CAO 104.0.

Following these procedures, maintenance training staff will be able to:

- provide training in accordance with these procedures
- assess an employee's competencies in accordance with these procedures
- where appropriate, issue a certification authorisation in accordance with these procedures.

  Note: For the purpose of this manual, employee means any individual who is performing or certifying for maintenance on behalf of and under the control of the COA holder.

4 Training program management

This program will be managed by a person appointed to act as the Training/Quality Manager.

4.1 Qualifications

A Training/Quality Manager must have the following attributes:

- credentials in quality management, acceptable experience in a training or quality management role, or acceptable experience in a maintenance supervision role
- a high level of understanding of the maintenance regulations in Parts 4 and 4A of CAR
- an understanding of the Part 66 licence regulations
- an understanding of workplace training and assessment processes
- a high level of understanding of the provisions and application of CAO 104.0
- a high level of understanding of the procedures set out in this training and assessment manual
- a high level of understanding of the responsibilities of the person administering the CAR 42ZC (6) delegation on behalf of the COA holder.

4.2 Training/Quality Manager responsibilities

The Training/Quality Manager will have the following responsibilities:

- assessment of training providers using the guidelines set out in Sections 5 and 7 of this manual
- if external training providers are to be engaged, assessment of the external provider to ensure that the provider is able to deliver the required training outcomes as set out in this manual
- ensuring that each training plan is configured to:
  - adequately meet the trainee's identified training needs
  - provide training in all aspects of the aircraft/engine that are unique to the aircraft/engine particularly features or techniques that would be unlikely to be encountered during normal performance of the trainee's licence privileges
- review training results for each trainee and determine whether the training objectives have been satisfactorily achieved
- issue certification authorisations upon satisfactory completion of training and assessment
- notify CASA within 5 months of issuing a certification authorisation for an excluded system or type, and again at the expiration of 6 months if in the opinion of the manager, the trainee has successfully completed the training and certification period
- monitor the training program, for effectiveness and amend the program if deficiencies are identified
- notify CASA of any amendments to the training programs set out in this manual and provide CASA with copies of the amended pages with the changes highlighted with change bars
- ensure that certification authorisations are only issued or re-issued while the COA holder holds a CASA delegation for the purpose of subregulation 42ZC (6) of CAR to

issue certification authorisations to employees for the purpose of paragraph 42ZC (4) (e) of CAR.

4.3 Trainee eligibility assessment guidelines

In order to meet the requirements specified in CAO 104.0 the following course entry requirements will be applied:

- the trainee must possess a valid CASA Part 66 licence in the applicable subcategory for the aircraft for which training is to be provided.
- If training is for an excluded type or a Part 1 WHR certification authorisation, the trainee's licence must not be affected by an exclusion which would disallow maintenance of the particular aircraft (i.e. E9-fabric surfaces, E10 -wooden structures, E12-propellers).
- If training is for an excluded system the trainee must have the appropriate licence category and sub-category for the system as set out in the CASA Part 66 Manual of Standards.

5 Training procedures

Guidance note: The following training program will ensure that an individual is able to demonstrate the required competencies for the issue of a certification authorisation. The training program needs to include the following:

- training in the use of relevant data and documentation
- training in maintenance tasks that are unique to the aircraft, engine or system
- training in the application of any specialised maintenance techniques that are unique to the aircraft, engine or system
- training in the use of test equipment that is unique to the aircraft or engine.

5.1 Approved training providers

Instruction will be provided by personnel experienced and qualified in the type of maintenance training being given to an individual under this training plan.

Training will be given in an on-the-job format or a combination of on-the-job and theoretical training. The makeup of the training will be decided by the training manager, based on an assessment of the needs of the individual trainee and the complexity of the particular aircraft.

Training can be given by approved licence holders or task specialists with recognised skills and experience in the relevant discipline. In the case of ex-military aircraft, training may also be provided by non-licenced individuals who have provided or supervised maintenance for a particular Part 1 aircraft in the military environment or provided maintenance training for the particular aircraft in the military environment.

Approved training personnel will be listed in a register of trainers contained in each relevant section of this manual and be revised as instructors are added or removed.

The register will detail the names of approved trainers and their qualifications for the role.

6 Training for initial issue of a Part 1 WHR certification authorisation.

Part 1 WHR training will be given in accordance with the training plan in this section, which will be varied as required to reflect the individual's training needs and specific requirements of the aircraft for which training is to be given.

A record of training and assessment will be retained in the personnel file of the individual and maintained by the Training/Quality/Aircraft Maintenance Manager.

Training records will be made available to CASA for review, as required by CASA.

6.1 Assessment for initial issue of a Part 1 certification authorisation

Upon successful completion of training, a trainee will be assessed in accordance with the assessment guidelines set out in Section 10 of this manual. Assessment will be made by the approved training provider conducting the training. The results will be reviewed by the Training/Quality Manager.

If the Training/Quality Manager is satisfied that the trainee has achieved an acceptable level of competency in all knowledge topics listed in Table 1 and the maintenance tasks listed in Table 2, the trainee will be issued with a certification authorisation for the Part 1 aircraft in which the training and assessment was given. The certification authorisation will be valid for not more than 2 years from the date of issue.

Personnel holding current Part 66 licences in the category and ratings that cover a particular Part 1 aircraft will be deemed to have met the training requirements as specified in Section 8 of CAO 104.0 and may be issued with a Part 1 certification authorisation.

Personnel who hold a CASA issued maintenance authorisation issued under regulation 33B or paragraph 42ZC (6) of CAR will be deemed to have met the training requirements as specified in section 8 of CAO 104.0; and may be issued a Part 1 certification authorisation.

6.2 Assessment for re-issue of a Part 1 certification authorisation

At the end of a 2 year period since issue or reissue of a certification authorisation, the Training/Quality Manager must assess the trained WHR employee to re-issue the certification authorisation for a further 2 years.

If, in the view of the Training/Quality Manager, no additional or refresher training is required, the certification authorisation may be reissued accordingly.

If, in the view of the Training/Quality Manager, further training is required, a training plan will be drawn up based on the assessed training needs.

Training for re-issue may be given by an authorised trainer or an employee who holds an equivalent valid certification authorisation.

Certification authorisations held by employees on the basis of a CASA issued authorisation or type rating, may be reissued without further assessment at the Training/Quality Manager's discretion.

6.3 Part 1 WHR training plan outline

MAINTENANCE TRAINING PROGRAM

……. Pty Ltd COA Number ……

Aircraft Type…… Model…….. Engine……..

Trainee……..

6.3.1 Objectives and outcomes

The Training/Quality Manager will ensure that a person is properly trained in the knowledge elements (Table 1 below) and maintenance procedures (Table 2) that are specific to the type of aircraft.

On completion of the training, the trainee will have demonstrated the competencies required to maintain the type of aircraft to an acceptable standard of airworthiness in accordance with the relevant instructions for continuing airworthiness.

6.3.2 Reference material

- CAO 104.0
- Part 4 and 4A of CAR
- Applicable aircraft or system maintenance data.

6.3.3 Processes

This training plan is based on the use of on-the-job training that will be provided using the aircraft and maintenance facilities of ……..

Training and assessment will be provided by an employee or contractor of ....., who has the knowledge, qualifications and licence/authorisation required to perform and certify for completion of the maintenance for which the training is provided. Training in knowledge topics must verify that the trainee meets the appropriate knowledge level. If deemed appropriate, external training providers may be engaged to provide supplementary theory instruction or skills training in particular special processes or techniques.

6.3.4 Explanation of knowledge levels

6.3.4.1 Level 1

A familiarity with the principal elements of the topic such that the following trainee objectives are met:

- familiar with the basic elements of the topic
- able to give a simple description of the topic, using common words and examples
- able to use typical terms.

6.3.4.2 Level 2

A general knowledge of the theoretical and practical aspects of the topic and an ability to apply that knowledge, such that the following trainee objectives are met:

- understand the theoretical fundamentals of the topic
- give a general description of the topic using, as appropriate, typical examples
- demonstrate awareness of practical applications of the topic.

6.3.4.3 Level 3

A detailed knowledge of the theoretical and practical aspects of the topic, and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner, such that the following trainee objectives are met:

- describe the underlying intent and implications of the topic
- give a detailed description of the topic using theoretical fundamentals and specific examples
- explain in detail the theoretical and practical application of the topic.

Table 1 – Knowledge elements Part 1 WHR

Topic	Level	Achieved	
		Y/N	Date and Signature
Source appropriate data references for each maintenance task.	3		
Demonstrate an understanding of where to find: • inspection wear limits • damage limits • acceptable repair practices • service life limitation • maintenance instructions • special inspections	3		

Table 2 – Maintenance procedures

Ground handling	Competent	
	Y/N	Date and Signature
Demonstrate familiarity with: • mooring • earth points • towing and turning limits • ground power starting …… …… *(Insert additional specific items if required)*		
Inspections	Competent	
	Y/N	Date and Signature
Perform under supervision: • daily Inspection • 25 hour inspection and service • 50 hour inspection and service • Annual inspection …… *(Insert additional specific items if required)*		

Airframe	Competent	
	Y/N	Date and Signature
Jacking and levelling - Demonstrate knowledge of: • Safety precautions during jacking • Jacking points • Levelling points		
Control surface travel checks - Demonstrate an understanding of control surface travel limits, and competency in the use of any aircraft specific travel measuring equipment such as travel gauges etc (*Delete if only standard tools and procedures required)*		
Undercarriage functional tests Strut charging - Demonstrate use of any aircraft specific strut charging equipment or techniques *(Delete if only standard tools and procedures required)*		
Flight control system rigging Flight control system – if applicable, demonstrate competency in aircraft specific techniques required when removing, replacing or adjusting the ……..….system *(Delete if only standard tools and procedures required)*		
Pressurisation tests (if applicable) – Demonstrate competency in setting up and operating ground pressurisation unit and an understanding of any aircraft specific safety requirements *(Delete if no specific differences to other pressurised aircraft)*		
Crew oxygen system (if applicable) – Demonstrate competence in any applicable aircraft specific techniques when servicing crew oxygen system *(Delete if no specific differences to other pressurised aircraft)*		
Explosive devices - Demonstrate comprehensive understanding of safety requirements and maintenance procedures related to: • ground safety-disarming • safety requirements before entering cockpit • flight arming • removing and installing ejection seats *(Delete if no explosive devices fitted)*		
Structure- Special repair techniques - Demonstrate competency in repairing any of the following if applicable: • bonded wood sandwich construction (such as ply/balsa/ply) • laminated plywood • wood box beams • composite structures • fabric covering and repairs *(For each aircraft, delete if not required or insert additional training headings as required)*		

Engine	Competent	
	Y/N	Date and Signature
General - Demonstrate competency to carry out the following tasks to an acceptable standard of airworthiness: • compressor/engine wash • compressor/engine inspection • oil sampling • fuel system component changes and rigging • fuel control unit installation and rigging		
Engine ground runs-high powered aircraft Demonstrate situational awareness with regard to danger zones around intakes and propeller/jet exhaust. Select run-up area where noise and propeller/jet blast will not create hazards to others. Demonstrate proper aircraft anchoring procedures. Conduct engine runs observing any type-specific precautions and procedures		

At the successful completion of the training and assessment in each task, the quality manager will be notified that the trainee is eligible for issue of a certification authorisation.

Table 3– Training providers for Part 1 WHR Maintenance

Name	Authorised to provide training on:	Qualifications

7 Excluded type training procedures

7.1 Background

This section describes the procedures that will be followed by ……when training and assessing an employee for the purpose of issuing a certification authorisation for one or more excluded aircraft types.

7.2 Scope of this section

Training and authorisation under this section will only be given for those excluded aircraft types described for the purpose in the Table 2 of Appendix IX of the Part 66 MOS, and will be confined to aircraft listed in section 10 of this manual

7.3 Training procedure

A trainee will be trained in the theory and practical elements listed in Tables 4 and/or 5 and 6 of this manual. This training will be given as class-room training and/or on-the-job training.

Class-room training will only be provided for engines, or engine systems if in the opinion of the Training/Quality Manager, a particular aspect of an engine or engine system is sufficiently complex to require more than on-the-job training instruction.

7.4 Assessment

A trainee will be assessed during the course of the training and a final assessment will be at completion, using the guidelines set out in Annex A of this manual.

Assessment will be made by the training provider and the results will be reviewed by the Training/Quality Manager.

7.5 Authorisation issue

If a trainee is assessed as having met the required competency standards, the Training/Quality Manager will issue a certification authorisation for the aircraft (engine) type for which the training was given.

A certification authorisation for an excluded aircraft type will be issued for a period of 6 months and will not be renewable.

7.6 Notification to CASA

At the completion of 5 months from the date of issue of a certification authorisation to an employee, the Training/Quality Manager will send a preliminary notification to CASA Permissions Application Centre (PAC).

The notification needs to include the following details:

- name and COA number of the organisation
- name and ARN of the employee
- the excluded aircraft type for which the authorisation has been issued

- date at which the authorisation was issued
- name and position of the person making the notification.

At the completion of 6 months, the Training/Quality Manager will advise CASA that the Licensed Aircraft Maintenance Engineer (LAME) has successfully completed the excluded type training and has satisfactorily exercised the privileges of the certification authorisation for 6 months.

Table 4 – Instruction plan- Piston Engines

ATA Chapter	Elements	Required? Y/N	Theory Assessment Person/Sign/ Date	Practical Assessment Person/Sign/ Date	Quality Assurance Person/Sign/Date
70	Standard practices-engines				
70A	Constructional arrangement and operation (carburettors, fuel injection systems, induction, exhaust and cooling systems, supercharging/ turbocharging, lubricating systems				
70B	Engine performance				
71	Powerplant				
73	Engine fuel and control				
73A	FADEC				
74	Ignition				
76	Engine control				
77	Engine control systems				

ATA Chapter	Elements	Required? Y/N	Theory Assessment Person/Sign/ Date	Practical Assessment Person/Sign/ Date	Quality Assurance Person/Sign/Date
79	Oil				
80	Starting				
81	Turbines				
82	Water injection				
83	Accessory gearboxes				

Table 5 – Instruction plan - Turbine Engines

ATA Chap	Elements	Required? Y/N	Theory Assessment Person/Sign/ Date	Practical Assessment Person/Sign/ Date	Quality Assurance Person/Sign/Date
49	Auxiliary power (APUs)				
70	Standard practices-engines				
70A	Constructional arrangement and operation (installation, inlet, compressors, combustion section, turbine section, bearings and seals, lubrication systems)				
70B	Engine performance				
71	Powerplant				
72	Engine turbine and turboprop and ducted fan and unducted fan				
73	Engine fuel and control				
73A	FADEC				
74	Ignition				
75	Air				
76	Engine controls				
77	Engine indicating systems				
78	Exhaust				
79	Oil				
80	Starting				
82	Water injections				
83	Accessory gearboxes				
84	Propulsion augmentation				

Table 6 – The employee will be trained and assessed in the following maintenance procedures

Activity	Competent	
	Y/N	Date and Signature
Inspections (delete non – applicable items): Perform under supervision: • Daily Inspection • 25 hour inspection and service • 50 hour inspection and service • Annual/100hourly inspection …… …… …… …… *(Insert additional specific items if required)*		
Engine General- demonstrate competency to carry out the following tasks to an acceptable standard of airworthiness: • servicing oil/coolant etc • fuel system component changes and rigging • magneto removal/installation and timing • compressor wash		
Engine ground runs-high powered aircraft/turbine powered aircraft • demonstrate situational awareness with regard to danger zones around propeller • ensure that jet engine danger zones are clear of personnel and loose objects • select run-up area where noise will not create hazards to others. • demonstrate proper aircraft anchoring procedures • conduct engine runs observing any type-specific precautions and procedures		
Engine Inspection-demonstrate competency in using inspection aids (including borescope if applicable) to carry out: • cylinder inspection • crankcase inspection • camshaft/cam ring inspection • internal compressor/combustion chamber/turbine inspection • interpret inspection results using appropriate data references		

At the successful completion of the training and assessment in each task, the Quality Manager will be notified that the employee is eligible for issue of a certification authorisation.

Table 7 - Training providers for excluded type or system maintenance

Name	Authorised to provide training in/on:	Qualifications

Prerequisites:

Training personnel, for the purpose of excluded type or excluded system training, must have held a maintenance licence (CAR 30/Part 66/both) in the appropriate subcategory for a minimum of 5 years. The trainer must have held a rating in the particular aircraft or engine for which training is to be given for at least 18 months.

A person who holds, or has held, a CASA maintenance authorisation for the particular aircraft or engine for at least 5 years will be deemed to have met the requirements.

8 Wood structures and fabric covered surfaces

8.1 Inspect, test and repair fabric surfaces

8.1.1 Objectives

On completion of this training, a trainee will be able to apply hand skills, knowledge of fabric surfaces and maintenance publications to inspect, test and repair aircraft fabric surfaces and the application of hand skills, knowledge of fabric surfaces and maintenance publications to re-cover fabric surfaces of aircraft and aircraft components that are covered with fabric.

8.1.2 Reference material

- FAA Advisory Circular (AC) 43-13: current edition
- Poly-Fiber Procedure Manual
- Ceconite Procedure Manual
- Applicable aircraft maintenance data

8.1.3 Knowledge requirements

A trainee will be required to demonstrate a comprehensive theoretical knowledge of the following subject matters: (Knowledge levels are explained in Section 10).

Table 8 - Knowledge requirements

Topic	Level	Achieved	
		Y/N	Name /Signature /Date
WHS hazards associated with fabric covering processes and how to obtain relevant MSDS and PPE	1		
regulatory requirements relating to the repair of fabric surfaces	1		
industry publications relating to the repair of fabric surfaces	1		
aircraft fabric surface covering and finishing materials and principles	2		
fabric-covered component attachment methods	2		
types of fabric and related characteristics	2		
types of tape, cord and thread and their relative advantages and disadvantages	2		
cements and finishing scheme materials, their characteristics, uses, storage requirements and related safety precautions	2		
inspection requirements for new fabric prior to use	3		
the criteria for fabric rejuvenation, repairs and	3		

Topic	Level		Achieved
repair methods, including the need for re-balancing of flight control surfaces after fabric rejuvenation or repair			
the application of flight loads to fabric-covered surfaces, and related failure mechanisms	3		
compatibility of differing fabric materials and adhesives, sealants and dopes	2		
acceptable methods of testing fabric for deterioration	3		
acceptable methods of applying adhesives, sealants and tautening dopes	3		
acceptable methods for heat tautening of Dacron coverings	3		

If a trainee has passed the CASA Basic examination FE Fabric and Doping, the COA holder may deem the employee as having met the relevant required knowledge standards for this section.

8.1.4 Practical training

Using aircraft when available, and/ or training aids as required a trainee will be trained in the following maintenance tasks:

1. identify the type of fabric covering (cotton/Dacron/fibreglass etc.)
2. using relevant data inspect for:
    a. blockage of drainage holes at water and dirt collection points
    b. deterioration of protective finishings
    c. deterioration of fabric tensile strength
    d. damage to inspection panels and zips
3. carry out at least two of the following types of fabric repairs in accordance with applicable repair instructions.
    a. by surface rejuvenation
    b. by stitching
    c. by doped-on repair
4. apply tightening substrates (if applicable)
5. apply protective finishes
6. replace reinforcing rings
7. using an aircraft or a major subassembly of an aircraft, a trainee will be trained in the removal and replacement of the fabric covering using either the sewn envelope or doped/glued blanket method, including inspection and repair/replacement (as necessary) of inter-rib bracing tapes and anti-chafing tapes
8. the trainee will be trained on an aeroplane or major subassembly that requires the application of reinforcing tapes, use of rib stitching and application of finishing tapes
9. the trainee will be trained to inspect structural members, wiring, grommets and system components and initiate any necessary repair or rectification action before a new covering is applied

10. the trainee will apply fabric surface finishes making use of base or sealing coats, UV protective coats and final colour coats.

8.1.5 Assessment criteria

The trainee will be expected to:

- refer to relevant maintenance documentation in order to make an airworthiness assessment
- make appropriate preparation of the aircraft and establish access to the aircraft structure to allow for proper inspection in accordance with maintenance documentation
- inspect/test aircraft fabric for signs of damage, deterioration or loss of tensile strength in accordance with maintenance documentation and approved procedures
- assess damage or deterioration against limits specified by maintenance manual or other approved data to determine if repair, restoration or replacement is required
- inspect structural members, wiring, grommets and system components and initiate any necessary repair or rectification action
- fabricate and fit a fabric covering with appropriately placed inspection panels, zips and drainage holes
- apply a fabric finishing scheme ready for paint
- apply appropriate paint
- recognise defective doping and analyse the cause of the defect.

8.1.6 Required performance standards

The required performance standards are the following:

- extent of damage is correctly assessed to assist in determining repair procedure
- structure is supported and prepared in accordance with the applicable maintenance manual to ensure personal safety and freedom from damage
- appropriate repair scheme is identified in accordance with maintenance manual and/or approved data
- all materials and equipment required are organised
- fabric repairs are performed, in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out
- components are adjusted and/or re-balanced, where necessary, to operate within prescribed specifications
- where required, repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures.

At the successful completion of the training and assessment in each task, the Quality Manager will be notified that the employee is eligible for issue of a certification authorisation.

9 Inspect and repair aircraft wooden structures

9.1 Objectives

On completion of this training, a B1 Part 66 licence holder will be proficient in the application of woodworking hand skills and knowledge and the use of maintenance publications to inspect and repair aircraft wooden structures and wooden components to an acceptable standard for the purpose of applying to CASA for removal of an E10 exclusion.

9.2 Reference material

- FAA AC 43-13: current edition
- Applicable aircraft maintenance data

9.3 Theoretical knowledge

A trainee will be trained to understand the types of timbers and plywoods that are acceptable for aircraft use, their properties, strengths and limitations and attain the knowledge levels listed in section 10.

If a trainee has passed the CASA Basic examination FD Wooden Structures, the COA holder may deem the employee as having met the relevant required knowledge standards for this section.

Table 9 - Theoretical knowledge

Topic	level	Achieved	
		Y/N	Name/Signature/Date
The types of glues suitable for aircraft use	2		
The differences between: • caseins • resorcinols • urethanes • epoxies	1		
With regard to the various glue types, their: • strengths • limitations • storage requirements • mixing precautions • spreading requirements • assembly times • clamping requirements • environmental protection requirements • compatibilities	2		
The significance of: • grain slope, density and straightness • sap pockets, shakes and knots • moisture content and stability	2		

Topic	level		Achieved
With regard to wood structures the significance of: • compression cracks • splits • rot • fungal attack	2		

9.4 Practical training wood structure inspection and repair.

The trainee will be trained to:

- use typical hand tools including:
  - saws
  - planes
  - chisels
  - clamps
  - drills
- inspect a timber structure using:
  - tap tests to detect voids
  - feeler gauges to determine debonding or delamination
  - borescope and ink tests to test for compression cracks
- fabricate
  - a scarf splice in a spar (may be performed on a practice piece)
  - a plywood scarf joint (may be performed on a practice piece)
- repair a damaged wing rib (may be performed on a training aid)
- repair surface protection (may be performed on a training aid).

At the successful completion of the training and assessment in each task, the Quality Manager will be notified that the employee is eligible for issue of a certification authorisation.

10 Practical performance assessment

To be used when assessing an employee in accordance with sections 2, 4 and 5 of this manual

Trainee……

AIRCRAFT type/registration……...

10.1 Activity

TRAINEE OBJECTIVES ASSESSMENT FORM (FOR USE BY THE ASSESSOR)

USE REPORTS & INDICATIONS	PERFORMANCE ASSESSMENT				
	ATTEMPTS			RESULT *	
	1st	2nd	3rd	U	S
Trainee reads the available reports and indications (maintenance task)					
Trainee interprets the reports and indications correctly (Opens proper Manuals/takes right actions to start the process)					
FIND & USE AIRCRAFT DOCUMENTATION	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee finds proper troubleshooting procedure, if necessary					
Trainee makes the correct interpretation on TSM, AMM and other related procedures (this shows in the actions the trainee takes)					
CORRECTLY PERFORM ACTIONS	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee follows the procedure steps					
Trainee make sure that actions are properly done					
Trainee uses required tooling					
OPERATE IN COMPLIANCE WITH ENVIRONMENT	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee scans the environment before starting the task to ensure safety					
Trainee reads/interprets safety warnings correctly					
Trainee informs people of his/her work, if necessary					
Trainee continuously scans environment during task performance					
Trainee reacts properly to changes during task performance to ensure safety					
SYSTEM INTERACTION	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee ‘analyses’ the consequences of other systems before performing an action (trainee can do this him/herself or by asking the assessor or a knowledgeable colleague)					
Trainee takes other systems into account when acting on a system					
PERFORMS AIRCRAFT FINAL / CLOSE-UP	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee restores the aircraft back to initial condition (or appropriate condition depending on the circumstances)					
REPORTS IN MAINTENACE RECORDS	ATTEMPTS			RESULT	
	1st	2nd	3rd	U	S
Trainee fills the proper field in the maintenance record					
Trainee uses proper references and descriptions in the maintenance record					

Coaching comments Assessors Name

1st attempt

2nd attempt

3rd attempt

RESULT OF THE ASSESSMENT	Succeeded ❒ Remedial ❒
TRAINEE NAME:	
TRAINEE SIGNATURE:	DATE:
ASSESSOR NAME:	
ASSESSOR SIGNATURE:	DATE:

Unsatisfactory	Satisfactory
Observed performance not adequate/ had safety implications	Observed performance was adequate

DATA: The trainee will be required to demonstrate a comprehensive understanding of the maintenance manuals and other data related to the aircraft on which training is being given.

Appendix A

Aircraft for which excluded type training may be provided

Small or non-rated aircraft (Bristol Centaurus)
Small or non-rated aircraft (De Havilland Goblin 35)
Small or non-rated aircraft (PW R1830/R2000)
Small or non-rated aircraft (PW R2800)
Small or non-rated aircraft (Rolls Royce/Packard Merlin)
Small or non-rated aircraft (Wright R1820)
Small or non-rated aircraft (WSK PZL (Kalisz) Asz 62IR-M18)
Small or non-rated aircraft (Wright R2600)
Small or non-rated aircraft (Wright R3350)

Appendix B

Certification authorisation form

XXXXX Maintenance.

COA no ……

Certification authorisation

Issued pursuant to subsection 7 / subsection 8/ subsection 10 of CAO 104-1

(delete whichever does not apply)

Issued to ……

(Name of holder) …….is authorised to carry out maintenance and perform maintenance certification for the following Part 1 WHR aircraft / excluded aircraft type/ excluded system on behalf of xxxxxx Maintenance

Aircraft

1…….

2…….

3……..(expand if required)

System (delete if not applicable)

1. Wood aircraft structures

2. Fabric aircraft coverings

This authorisation expires at midnight on (date)…….

Issued by……

Position: Quality Manager/Chief Engineer/Training Manager (

Manual holder’s acknowledgement of receipt of amendment.

CAO 104.0 training manual amendment-acknowledgement

Amendment Number…… Date……..

Manual Number……. Manual Holder…….

I have actioned the amendment and have read and understand the change(s)

Signed…… Date…….

Each manual holder, on receipt of a manual amendment must action the amendment as required (pen amendment or page insertion/replacement) and having done so, return this signed acknowledgement to .....

The acknowledgement may be returned to …….. via post, courier or emailed as a PDF document.