



Australian Government
Civil Aviation Safety Authority



Engineer Careers

Aircraft maintenance
licences & ratings



Engineer

AIRCRAFT MAINTENANCE



A guide to:

Maintenance careers

Licences, ratings and approvals

Training requirements

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The Civil Aviation Safety Authority (CASA) is responsible for the safety regulation of Australia's civil aviation operators, and for the regulation of Australian-registered aircraft outside Australian territory.

CASA sets safety standards and ensures these are met through effective entry, compliance and enforcement strategies. Additionally, CASA provides regulatory services to industry, and plays a part in safety education for the aviation community. CASA also administers exams and issues licences for Australian pilots.

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To obtain an understanding of the role that an aircraft maintenance engineer has in the aviation safety system, one must understand the maintenance safety culture that has been nurtured, over many years, by maintenance engineers, technicians & mechanics worldwide. Jerry Lederer, founder of the US Flight Safety

Foundation, and also referred to as the "Father of Aviation Safety" in America, penned a Mechanic's Creed that applies to aviation maintainers worldwide. Australia's aircraft maintenance engineers and technicians, like their counterparts in the rest of the world, are an important link in the aviation safety culture.

The Maintenance Creed

UPON MY HONOR I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a qualified aircraft maintenance engineer/technician. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me.

IN DISCHARGING this trust, I pledge myself never to undertake work or approve work which I feel to be beyond the limits of my knowledge nor shall I allow any non qualified superior to persuade me to approve aircraft or equipment as airworthy against my better judgment, nor shall I permit my judgment to be influenced by money or other personal gain, nor shall I pass as airworthy aircraft or equipment about which I am in doubt either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.

Therefore, for individuals that are willing to commit themselves to upholding these ideals, there is a long term and satisfying career as an aircraft maintenance engineer or technician.

Maintaining the fleet

Keeping Australia's fleet of over twelve thousand private and commercial aircraft flying safely is the job of the licensed aircraft maintenance engineer (LAME).

Australia has an internationally recognised aviation maintenance safety culture that, in no small way, relies on the professionalism and dedication of aircraft maintenance engineers licenced and non-licenced, past and present.

The attainment of a licence and performance of the duties of that licence greatly enhance the privileges and responsibilities of the maintenance professional. The licence permits the LAME to perform a greater variety of maintenance than any other single maintenance entity and reflects the emphasis that is placed on the holder of the licence in perpetuating air safety.

There is satisfaction, too, in seeing your work result in well-maintained, safe and efficient aircraft.

Seeking employment with an aviation maintenance organisation as an apprentice or trainee is the normal method of getting started in aviation's Maintenance Repair and Overhaul (MRO) industry. However there are also opportunities for those that seek change from allied fields.

There is a problem worldwide, including Australia, with an aging MRO workforce, especially maintenance specialists qualified to international standards, so opportunities for employment and advancement in the MRO field has never been better, particularly as aviation technology expands and becomes more "hi-tech".

There are national aircraft maintenance engineer trade qualification standards that meet the needs of the domestic aviation MRO industry and, as required, they are



internationally harmonised. This enables Australian academically qualified people to access the global aviation MRO industry. Recognition of the Australian licensed engineer standards internationally relies on agreements between CASA and other National Airworthiness Authorities.

Aircraft maintenance personnel maintain a whole range of aircraft and their components, from simple piston engines to complex, state of the art microprocessor controlled jet aircraft; from classic wood and fabric structures to those made from advanced composites and complex metal alloys. Aircraft electrical systems also range from basic technologies like those found in cars through to large scale generation and distribution systems with enough capacity to power a small town. Aircraft flight management systems, navigation and communication systems embrace advanced microprocessor, satellite and laser technology and a career in maintaining these systems can offer far more challenge and diversity than the servicing of ground based devices.

A career path in aircraft maintenance can follow any of these specialisations, with opportunities available in maintaining

light aircraft through to large jets utilising a variety of methods and techniques that range from simple on-the job hand skills to highly computerised monitoring techniques. There is satisfaction, too, in seeing your work result in well-maintained, reliable, safe and efficient aircraft.

To get your licence you can follow a number of pathways: through military training, airline training and training with a general aviation maintenance organisation. The rationale why the Civil Aviation Safety Authority (CASA) licence qualified maintenance engineers to sign documents that release an aircraft to service emanates from an international treaty, the Convention on International Civil Aviation, Annex 1 and 6. Australia, as a signatory to that Convention, is therefore obliged to issue licences to qualified persons that must be identified as aircraft maintenance (engineer/technician/mechanic).

Once you have gained your licence as an aircraft maintenance engineer you will be in a position to follow a rewarding career either in Australia or overseas, as Australian qualifications are recognised in many countries.



What is an authorised person?

Every aircraft, whether it be a balloon, glider, aeroplane (small or large) or helicopter (small or large) relies heavily on people to inspect it and to do work that keeps it in a safe condition for flight. Some individuals will specialise in a particular aircraft system while others will have broader skills but collectively, they combine to ensure that aircraft, including all their parts, are kept in a condition so that the aircraft remain airworthy.

An authorised person is a person with training and experience sufficient to be 'authorised' by an MRO to perform certain maintenance functions. They can specialise on a specific aircraft or aircraft system, a broad class of aircraft or aircraft systems or a specific process or processes associated with aircraft maintenance. As an example, a particular process may be aircraft welding, non-destructive inspection, fabric repair, composite repair, in-situ metal surface treatment, etc. The size of the organisation performing these aircraft processes will normally dictate the

need for individual specialists. In small organisations there is a tendency for these people to be more multi skilled whereas larger organisations tend to have individuals specialised in specific tasks and processes. This is an economic decision made by the employer that provides the customer with better efficiencies.

To understand the work of an authorised person, then one must know what aircraft maintenance is. Aircraft maintenance addresses all work associated with keeping an aircraft safe for flight. Some of this work is carried out on the aircraft and some is performed in workshops. Servicing tasks such as fuelling, cleaning, replenishment of potable water, etc are not defined as maintenance tasks.

Irrespective of whether the work is carried out on the aircraft ('on-wing maintenance') or in a workshop ('off wing maintenance'), the authorised person has the same responsibility. For example, an authorised person working on navigation equipment in a workshop is just as important to aviation safety as the person rectifying defects prior to departure.





Aircraft maintenance, as distinct from workshop maintenance, is performed by persons holding qualifications appropriate for the task being carried out. The range of skill competencies that an individual must have depends on the type of aircraft or aircraft system being maintained. Broadly, avionic systems have specialists to inspect, test and evaluate those systems, or parts of those systems. Conversely, the aircraft and its mechanical systems are maintained by broadly trained individuals or, in some cases, certain tasks or processes are performed by specialists that may, or may not be, classified as an aviation professional.

Workshop maintenance generally requires people trained specifically for the purpose of the workshop. Many maintenance tasks

and processes cannot be performed on the aircraft so the component or part has to be removed and sent to the workshop. Some of those tasks are engine overhaul and repairs, avionic component bench testing, overhaul and repairs, airframe & systems component overhaul and repairs and testing of many articles used on an aircraft.

Though much of the work associated with aircraft can be taught by on-the-job training, to be properly qualified, a person should hold skill competency qualifications issued under the Australian Qualification Framework (AQF). For additional information refer to Manufacturing Skills Australia website www.mskskills.com.au and click on **metals engineering aerospace boating** for training pathways.



What is a LAME?

Many aviation professionals holding suitable qualifications in either an avionic and/or mechanical discipline are licensed by CASA so they may certify that work has been properly completed by signing a document, after completion of maintenance, to release the aircraft back into service. These individuals are known as LAMEs (pronounced Lay - Mee). This licence grants added privileges and responsibilities to certain qualified people.

CASA issues the licence because Australia is a signatory to an international treaty, "The Convention on International Civil Aviation", and Annex 1 to that Convention obligates the Commonwealth (CASA) to issue maintenance personnel licences to aircraft maintenance personnel on condition they meet the Annex 1 standards.

CASA therefore aims to ensure applicants for a licence or rating meet at least the Annex 1 standards in respect of knowledge, experience and skill that CASA has specified for that licence or rating. Structured training to obtain the skills is also recommended in Chapter 4 of Annex 1. Australia is moving to a formal training system to achieve these skills.

The LAME may be licenced either on a broad category of aircraft, for example simple piston powered aircraft, or by specific aircraft or system types, such as Boeing 747 or Rolls Royce RB211. Aircraft avionic systems may also be entered either as a specific aircraft or under broad system categories. These specific details are called ratings.

Irrespective of the licence or rating, the international privilege of a LAME is also stated in Annex 1. The duty of the LAME is to certify the aircraft, or parts of the aircraft or system, as airworthy after an authorised repair, modification, or installation of an engine, accessory, instrument, and/or item of equipment, and to sign a maintenance release following inspection, maintenance operations and/or routine servicing.

The Australian privileges of the LAME are to sign for the completion of aircraft work, to perform independent flight control inspections and to release the aircraft to service after maintenance. Annex 6 to the Convention states the LAME must sign the aircraft's 'maintenance release' after maintenance. Whilst this takes many forms around the world, this is a statement that the aircraft is safe to fly.



From 2007, CASA will progressively align LAME licences and ratings with the European Aviation Safety Authority (EASA) LAME licences and ratings. This EASA licensing system is based on different needs for Line (ramp) and Base (hangar) maintenance on modern transport category aircraft and aligns closely with similar licensing systems used elsewhere.

This change has necessitated a complete new training package to be developed by educationalists so that people can complete a competency training package with CASA recognised training organisations that will underpin the new style licences. These new licence categories will be identified as A, B1, B2 and C in the same manner as EASA has structured their licence categories and ratings.

The LAME licence category or rating specifies the scope of the licence, whilst the privileges remain for all cases as the ability to certify that maintenance work has been completed and aircraft or components are safe to be operated. The scope relates to the type of licence held. For instance, if maintenance has been completed in the specialist avionic category then the LAME will need to have an avionic licence category and rating applicable to that avionic maintenance. The avionic licence category applies across all avionic equipped aircraft types. The mechanical licence category covers aircraft, aircraft systems, including engines and some electrical systems for aeroplanes and rotorcraft.



The Working Environment

LAMEs must depend on pilots to describe the problems in order to locate and repair equipment. A pilot might discover before takeoff that the fuel gauge is malfunctioning. LAMEs will then try to diagnose the origin of the problem, testing the electrical system in an effort to find any faulty wires, which they would then replace. As always, safety comes first, but LAMEs perform their duties as fast as possible so that the aeroplane can remain in service.

The capabilities of aircraft have been improved by the avionics systems which form an important part of overall design. Parts utilised for aircraft navigation and radio communications, weather radar systems, and other instruments and computers that control flight, and engines, are repaired and maintained by avionics engineers and technicians. More and more time is required to repair avionic systems, such as computerised controls, due to the advancements made in technology. At times these specialists must perform an analysis of problems and create new fixes for complicated avionic problems.

A mechanical engineer's range of work can vary from jets to propeller-driven aeroplanes to helicopters. However, some find their niche by specialising in a specific area of the aeronautical product, like the engine, electrical system, or hydraulics. Engine specialists have the authority to service and repair engines, as well as perform some work on propellers. Airframe specialists have the authority to do any work on the aircraft airframe and aircraft systems, with the exception of

work on instruments, powerplants, and propellers. Mechanical engineers, perform work on every part of the aircraft, except instruments and radio systems.

Basically, the working environment varies from Line (open air) to Base (hangar) to workshop maintenance that includes scheduled and unscheduled maintenance, repairs, modifications and inspections mandated by CASA in order to keep aircraft operating optimally by focusing primarily on preventive maintenance. The work, depending on the complexity, may be performed in the field or in "hi-tech" workshops.

The working environment varies from work on the Line dispatching "serviceable" aircraft to work at a Base doing minor and major work in hangars or workshops. Another reason the environment is so attractive to mature workers is that personnel are subject to drug and alcohol testing to ensure that the working environment remains safe. This is seen as creating a better working environment. Many aerodrome working environments are also subject to security requirements that provide improved working conditions.

All required work, including replacing old components, is carried out to ensure everything is in running order by inspecting the engines, landing gear, instruments, pressurised sections, accessories – brakes, valves, pumps, and air-conditioning systems. Inspections are scheduled according to one or a combination of the following factors; the number of hours in flight the aeroplane has amassed, number of days passed since the last inspection, or the number of cycles of operations. Bigger, more complex aircraft contain



monitoring systems made of electronic boxes and consoles that track the aircraft's main functions and contain information valuable to aircraft reliability.

Each aircraft has special access doors that allow access to check the engine, and special lifts and hoists to take out the engine in order to make repairs or replace it all together. At times, the engine will be dismantled, then various tools and instruments are used to check components for corrosion, while x-rays and magnetic inspection equipment may be used to locate unnoticeable cracks. Old parts are replaced with new ones, or undergo necessary repairs. Other

aspects of the aircraft are examined and serviced as well, including sheet metal or composite structures, the tension of control cables, corrosion, distortion, and cracks in the fuselage, wings, and tail. Once the necessary repairs are made, the equipment is put through a series of tests to ensure that it is functioning properly.

Worn or defective parts are repaired or replaced. Damaged or worn sheet metal or composite surfaces are also repaired; control cable tensions measured; and checks for corrosion, distortion, and cracks in the fuselage, wings, and tail are performed. After completing all repairs, tests are made to ensure that it works properly.

Training and Job Qualifications

Most engineers and technicians that work on civil aircraft obtain their qualifications under the AQTF system as an "avionics maintenance technician," "airframe/engine maintenance engineer," or an avionic "electrical/instrument/radio maintenance engineer." You must be qualified to inspect, repair, test and/or maintain aircraft and aircraft components.

Australia has implemented a competency based system that will attest to a person's competency to perform maintenance tasks. This replaces the knowledge tests and experience schedule that had to be completed prior to recognition of skills.

Refer to Manufacturing Skills Australia website www.mskills.com.au and click on **metals engineering aerospace boating** for more details on aerospace maintenance training pathways.

It is important to understand certain principles taught in mathematics, physics, chemistry, electronics, computer science, and mechanical drawing because they help explain how an aircraft functions, and are both useful and at times necessary to know when making repairs. Adopting the correct pathway in secondary schools will prepare prospective

maintenance professionals. Refer Career Advice Australia's website: www.connecttoyourfuture.dest.gov.au.

Good communication skills are also paramount as well, and courses that focus on this area are helpful, because of the need to read and write reports.

An employee with the ability to perform many different duties is valued by employers. The Australian military aircraft maintenance training is also based on the civil aviation AQTF system. Experience in the military will provide an applicant with a great advantage when coupled with vocational educational training.

Maintenance work done on aircraft requires a higher than normal aptitude. Applicants that have the right combination of motivation, enthusiasm, and a good work ethic that can identify and solve mechanical problems are most desired by employers.

In order to maintain the validity of the specialist licence, regulations require current experience. This requires six months experience in the field in the past 24 months. Due to the ever increasing complexity of aircraft, some employers insist LAMEs stay up to date by taking training courses as they continue to work. Training requirements can also be met by taking courses offered by manufacturers or employers, via outside contractors.



Choosing a training organisation

In the major cities there are well-established training organisations dealing with aircraft maintenance. In some larger regional centres there may be privately-run or government-funded training organisations.

You should shop around to find the training provider who best meets your specific requirements.

You should contact these providers before leaving school or arranging for work experience.

When you contact a potential training provider, ask them these questions:

- ▶ Do they have classes near you?
- ▶ What are the entry requirements?
- ▶ What are their facilities like?
- ▶ What subjects are they teaching and when (a timetable)?
- ▶ Do they have or can they arrange external studies?
- ▶ Can they help you with the experience requirements?
- ▶ Are they approved by CASA? Note that this will be relevant only if proposed new rules requiring CASA approval of training organisations are passed into law.
- ▶ When can you start? Do you have to start at the beginning of the year?
- ▶ What are the course fees?
- ▶ Can you apply for government funding?
- ▶ Do they have a system where they will recognise any previous training and or experience?
- ▶ Do they have night classes?
- ▶ What are the qualifications of their instructors?
- ▶ What help can I receive (student services etc)?
- ▶ What will be my qualification at completion?

Types of training organisations

In the Australian aviation training industry there are five training schemes:

1. Airline training (full-time)
2. Dedicated training at specialist schools (full-time or part-time)
3. Maintenance engineering training as part of a TAFE or institute of technology certificate course (full-time or part-time).
4. Private training schools.
5. Through the Australian Defence Force.

- ▶ Do they know of any employer willing to take on an apprentice or trainee?
- ▶ Are their courses recognised all over Australia and/or internationally?
- ▶ Can the course be part of a diploma or degree?
- ▶ What arrangements have they made for people who are training externally or in remote areas to have their experience assessed?
- ▶ Will this assessment cost any more than normal fees?
- ▶ How do I enrol?
- ▶ When do enrolments close?
- ▶ Can I do additional training to finish earlier?
- ▶ Can they provide full-time training?

You should contact several providers and then choose the one which best suits your needs.

What a maintenance engineering licence allows you to do

Anyone can maintain an aircraft as long as they are aware of their legal obligations, are employed by a maintenance organisation approved to carry out the maintenance and have the skills and experience to do the work.

What they are not allowed to do is to certify that work is completed to the regulatory requirements and standards; or to supervise another person doing the work.

As a holder of an Aircraft Maintenance Engineers Licence you can:

- ▶ Maintain an aircraft for which you are licensed
- ▶ Certify or sign for maintenance covered by your licence.
- ▶ Supervise another person working on the aircraft, provided that you are permitted to do that work yourself – for example, a LAME licensed for engine work can supervise an unlicensed person doing engine work.

The scope of the aircraft maintenance licence allows you to do all work which falls within your licence category, as well as basic maintenance in other categories.

In many instances, a licensed engineer can carry out and sign for maintenance in areas not normally associated with the area their licence covers – for example, an airframe LAME can do some (restricted) work on electrical systems, instrument systems and radios. This is detailed in CAO 100.90. This document is available on the CASA web site or at your local CASA office.

The licence holder's responsibilities

In civil aviation, Licensed Aircraft Maintenance Engineers are fully responsible for the work they do, and often for work done by others. Just as a pilot has a responsibility to ensure that a flight is performed safely and in accordance with the law, the licensed engineer has similar responsibilities for maintenance.

LAMEs must ensure that any work they perform or supervise is carried out in a way which maintains the integrity, airworthiness and safety of the aircraft.

This means that LAMEs will do the work using the approved maintenance manuals with the right tools and approved parts.

The LAME certifies that the maintenance, test or inspection has been carried out to approved data and that the aircraft is airworthy and still meets its type design standard.



Job and Employment Opportunities

People with the necessary training in aircraft and component maintenance have a great opportunity for employment as aircraft and avionics maintenance engineers and technicians. Growth for aircraft maintenance professionals is expected to continue to increase on pace with the average growth in all industries through to 2012, as many jobs will open up to replace retirees. Employment for avionics technicians is expected to be just off the pace of the average rate of growth. Currently, these occupations are passing through a period of minimal growth, if any exists at all. The biggest projected airline growth region in the world is the Asia-Pacific region.

Through to the year 2012, the majority of job openings will come as a result of retirement, as a large amount of maintenance engineers are projected to leave the industry over the next ten years, opening up many positions each year. Others in the field may leave and find new work in related areas like automobile repair or other similarly related occupations.

Many factors affect the demand for engineers and with competition from other industries as well as retrenchments there is going to be a steady demand for these specialists.

Aircraft maintenance organisations, small commuter and regional airlines provide the best opportunities to applicants presently. The fastest growing portion of the airlines industry is commuter, regional airlines and helicopter operations, but these smaller companies also pay lower wages and

thus their job openings must be balanced with other considerations (lifestyle etc.). However, as many experienced workers leave to work for the major airlines or move to a new occupation, positions open up. As advancements in the complexity of aircrafts continue, the demand for skilled and knowledgeable engineers and technicians will increase.

Competition for positions will remain firm, since the major airlines offer higher wages and travel benefits, which the majority of applicants find quite enticing. Yet, the expectations for the future still predict future opportunities will be better than recent years. Experience is the key, and gives applicants the best chance to secure a job. The highest demand will exist for those engineers and technicians up to date with improvements in electronics and composite materials.

In some high schools and colleges there are opportunities for students in years 10 and 11 to arrange work experience as part of their studies. If you are interested in aircraft maintenance it would be worthwhile including an aircraft maintenance workshop in this work experience. This way you can be reasonably sure that a career in aircraft maintenance suits you.

Current Licence

There are five basic trade categories of aircraft maintenance engineers licence. These are:

- ▶ **Airframes**
- ▶ **Engines**
- ▶ **Instruments**
- ▶ **Electrical**
- ▶ **Radio**

A series of ratings and endorsements under each of these categories specify what maintenance the licence holder is entitled to perform.

The more complex the aircraft the more specific the licence. For less complex aircraft the licence is mostly general.



Airframes

The airframe category of licence allows you to certify for work done on aircraft structures and aircraft systems. The category is classified into the following ratings:

- Group 1** Aeroplane systems not classified in group 2 to 20 inclusive.
- Group 2** Helicopters not fitted with flight control hydraulic boosting.
- Group 3** Wooden airframe structures.
- Group 4** Fabric covering aircraft structures.
- Group 5** Power driven fluid systems other than groups 2, 19 or 20.
- Group 6** Airconditioning systems.
- Group 7** Aircraft fibre reinforced plastic composite construction as specified by CASA.
- Group 10** Pressurisation systems.
- Group 19** Helicopters with hydraulically powered flight controls, not classified in group 20.
- Group 20** Aeroplanes, powered by turbojet/turbofan engines, or pressurised and of a maximum take-off weight (MTOW) more than 8,000kg as specified by CASA.

Helicopters of MTOW greater than 3,500kg fitted with flight controls powered from more than one hydraulic source as specified by CASA.

Aircraft listed in AAC 9-91 deemed by the Civil Aviation Safety Authority to be of an unusual design requiring specialised maintenance techniques.



Engines

The Engine category of licence allows you to certify for work done on aircraft power-plants and engine systems. The category is classified into the following ratings:

- Group 1** Piston engines and associated engine systems in aeroplanes and airships other than those classified in Group 3 and Group 21.
- Group 2** Piston engines and associated engine systems in helicopters other than those classified in Group 3 and Group 21.
- Group 3** Supercharging and turbocharging systems.
- Group 21** Piston engines and gas turbine engines and associated engine systems in aeroplanes and airships as specified by CASA.
- Group 22** Piston engines and gas turbine engines and associated engine systems in helicopters as specified by CASA.



Radio

The radio category of licence allows you to certify for work done on aircraft radio systems. The category is classified into the following ratings:

- Group 1** VHF and HF communications systems other than in Group 20.
- Group 2** Audio and cockpit voice recorder systems other than in Group 20.
- Group 3** Automatic direction finding systems other than in Group 20.
- Group 4** VHF OMNI range systems other than in Group 20.
- Group 5** Marker, localiser and glideslope systems other than in Group 20.
- Group 6** Weather radar systems other than in Group 20.
- Group 7** Air traffic transponder systems other than in Group 20.
- Group 8** Very low frequency navigation systems other than in Group 20.
- Group 9** Radio altimeter systems other than in Group 20.
- Group 10** Distance measuring equipment systems other than in Group 20.
- Group 11** Doppler navigation systems other than in Group 20.
- Group 12** Satellite navigation systems
- Group 20** Radio systems installed in aeroplanes classified as high capacity aeroplanes and employed in regular public transport operations.

Aircraft deemed by CASA to be of an unusual design requiring specialised maintenance techniques.



Electrical

The Electrical category of licence allows you to certify for work done on aircraft electrical systems. The category is classified into the following ratings:

- Group 1** Electrical systems in aircraft equipped with single-generator power systems.
- Group 2** Electrical systems in aircraft equipped with multi-generator power systems other than in Group 20.
- Group 20** Electrical systems in aeroplanes powered by turbofan engines or pressurised above 8,000kg maximum take-off weight. Helicopters as specified by CASA.



Instruments

The Instrument category of licence allows you to certify for work done on aircraft instrument systems. The category is classified into the following ratings:

- Group 1** All general instrument systems not classified in Group 3 or Group 20 inclusive.
- Group 3** Autopilots and flight directors single axis other than in Group 20.
- Group 5** Autopilots and flight directors multiple axis other than in Group 20.
- Group 7** Autopilots and flight directors helicopters other than Group 20.
- Group 8** Remote indicating compass systems other than in Group 20.
- Group 9** Internal navigation and reference systems other than in Group 20.
- Group 10** Pressurisation systems other than in Group 20.
- Group 20** Instrument systems in aeroplanes powered by turbofan engines or pressurised and of maximum take-off weight above 8,000kg. Instrument systems in helicopters that require a stabilisation system as a condition of safe flight, or helicopters as specified by CASA. Aircraft deemed by CASA to be of an unusual design requiring specialised maintenance techniques.

Interim Airworthiness Authority System

CASA will be issuing Maintenance Authorities (MA) to applicants to enable the European style licensing training to be introduced from 2007 by CASA recognised training organisations. The issue of a MA will be an interim process until the Regulations are amended to implement as specialist licences and ratings under Part 66.

A MA may be issued in the following categories or subcategories:

- Category A** Subcategory A1, A2, A3 and A4—Line Maintenance
- Category B1** Subcategory B1.1, B1.2, B1.3 and B1.4— Mechanical
- Category B2** Avionics
- Category B1.1** Includes A1—Turbine engined aeroplanes
- Category B1.2** Includes A2—Piston engined aeroplanes
- Category B1.3** Includes A3—Turbine engined helicopter
- Category B1.4** Includes A4—Piston Engined helicopters

The scope of the avionic and mechanical MA differs from the scope of the current specialist licence.



Maintenance activities authority in subcategory A1, A2, A3 or A4

- 1 Minor scheduled line maintenance, including a scheduled inspection or check, up to and including a weekly check:
 - (a) specified in the operator's approved aircraft maintenance program; or
 - (b) if not specified in the operator's approved aircraft maintenance program that CASA considers is equivalent to a weekly check and lists in an AAC.
- 2 Minor maintenance, including a pre-flight, transit or overnight check, ground handling, APU running, minimum equipment list (*MEL*) implementation as allowed by paragraph 3 (p) and replenishment.
- 3 After appropriate task training for issuing an aircraft certificate of release to service as part of minor scheduled line maintenance or simple defect rectification:
 - (a) replacement of wheel assemblies; and
 - (b) replacement of wheel brake units; and
 - (c) replacement of emergency equipment; and (d) replacement of ovens, boilers and beverage makers; and
 - (e) replacement of internal and external

- lights, filaments and flash tubes; and
- (f) replacement of windscreen wiper blades; and
 - (g) replacement of passenger or cabin crew seats, seat belts and harnesses; and
 - (h) closing of cowlings and refitment of quick access inspection panels; and
 - (i) replacement of toilet system components, other than gate valves; and
 - (j) simple repair and replacement of internal compartment doors and placards, other than doors forming part of a pressure structure; and
 - (k) simple repair and replacement of overhead storage compartment doors and cabin furnishing items; and
 - (l) replacement of static wicks; and
 - (m) replacement of aircraft main and APU batteries; and
 - (n) replacement of in-flight entertainment system components, other than public address; and
 - (o) routine lubrication and replenishment of system fluids and gases; and
 - (p) deactivation of subsystems and aircraft components as permitted by the operator's MEL, if the task is one that CASA considers is a simple task and is listed in an AAC; and
 - (q) replacement of any other component for an aircraft type if the task is one that CASA considers is a simple task and is listed in an AAC.

Air Transport Association chapter designators of maintenance authority in subcategory B1.1, B1.2, B1.3, B1.4

- 07 Lifting and shoring
- 08 Levelling and weighing
- 09 Towing and taxiing
- 10 Parking, mooring, storage and return to service
- 21 Air-conditioning and cabin pressurisation
- 24 Electrical power
- 25 Equipment - furnishing
- 26 Fire protection
- 27 Flight controls
- 28 Fuel
- 29 Hydraulic power
- 30 Ice and rain protection
- 32 Landing gear
- 33 Lights
- 35 Oxygen
- 36 Pneumatics
- 37 Vacuum
- 38 Water and waste
- 45 Central maintenance system
- 49 Airborne auxiliary power
- 50 Cargo and accessory systems
- 51 Structures - general, but excluding:
 - (a) wooden structures and fabric surfaces unless:
 - (i) for wooden structures - the holder has obtained the relevant optional units of competency mentioned in paragraph 13.10 of this Order; or



(ii) for fabric surfaces - the holder has obtained the relevant optional units of competency mentioned in paragraph 13.10 of this Order; and

(Note These optional units of competency are marked Z in Appendix 6.)

(b) repair and modification of aircraft composite material, structures and components unless the holder has obtained the relevant optional units of competency mentioned in paragraph 13.9 of this Order.

(Note These optional units of competency are marked Y in Appendix 6.)

- 52 Doors
- 53 Fuselage
- 54 Nacelles and pylons
- 55 Stabilisers
- 56 Windows
- 57 Wings
- 60 Propeller - rotor
- 61 Propeller - propulsion, but only if the holder has obtained the relevant optional units of competency mentioned in paragraph 13.8 of this Order.

(Note These optional units of competency 81'0 marked P in Appendix 6.)

- 62 Rotor
- 63 Rotor drive
- 64 Tail rotor
- 65 Tail rotor drive
- 66 Folding blades and pylon
- 67 Rotors flight control
- 71 Power plant
- 72 Engine
- 73 Engine fuel and control
- 74 Ignition
- 75 Air
- 76 Engine controls
- 77 Engine indicating
- 78 Exhaust
- 79 Oil
- 80 Starting

(Note 1 This list is derived from Air Transport Association chapter designations.
Note 2 Avionics privileges within ATA chapters are limited in accordance with subparagraph 10.3 (b) of this Order.)



Air Transport Association chapter designators of maintenance authority in category B2

- 21 Air-conditioning and cabin pressurisation
- 22 Auto flight
- 23 Communication
- 24 Electrical power
- 25 Equipment - furnishing (electronic emergency equipment and cabin entertainment equipment)
- 26 Fire protection
- 27 Flight controls
- 28 Fuel
- 29 Hydraulic power
- 30 Ice and rain protection
- 31 Indicating recording systems
- 32 Landing gear
- 33 Lights

- 34 Navigation
- 36 Pneumatics
- 37 Vacuum
- 38 Water and waste
- 44 Cabin systems
- 45 Central maintenance system
- 49 Airborne auxiliary power
- 60 Propeller - rotor
- 61 Propeller - propulsion
- 73 Engine fuel and control
- 74 Ignition
- 76 Engine controls
- 77 Engine indicating
- 79 Oil
- 80 Starting

(Note 1 This list is derived from Air Transport Association chapter designations.

Note 2 Privileges within ATA chapters are limited to electrical and avionics aspects only in accordance with paragraph 10.4 of this Order.)

Choosing a workplace

Where you will be working in the aviation maintenance industry is really your choice.

There are some questions you should ask:

- ▶ Does the workshop give you the quality and range of experience you need?
- ▶ Do they have an apprentice or traineeship scheme?
- ▶ Will they allow me enough time for my studies?
- ▶ Does the workshop seem friendly and helpful?

- ▶ What will be my prospects once I finish training?
- ▶ What do they expect from me?
- ▶ Is there opportunity for overtime and extra work?
- ▶ What is their reputation like?

Time spent at this stage researching the experience required to gain a licence is very worthwhile. Know what you need, and talk to prospective employers to find out if they can meet your needs.

More information can be found on the CASA website at www.casa.gov.au



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