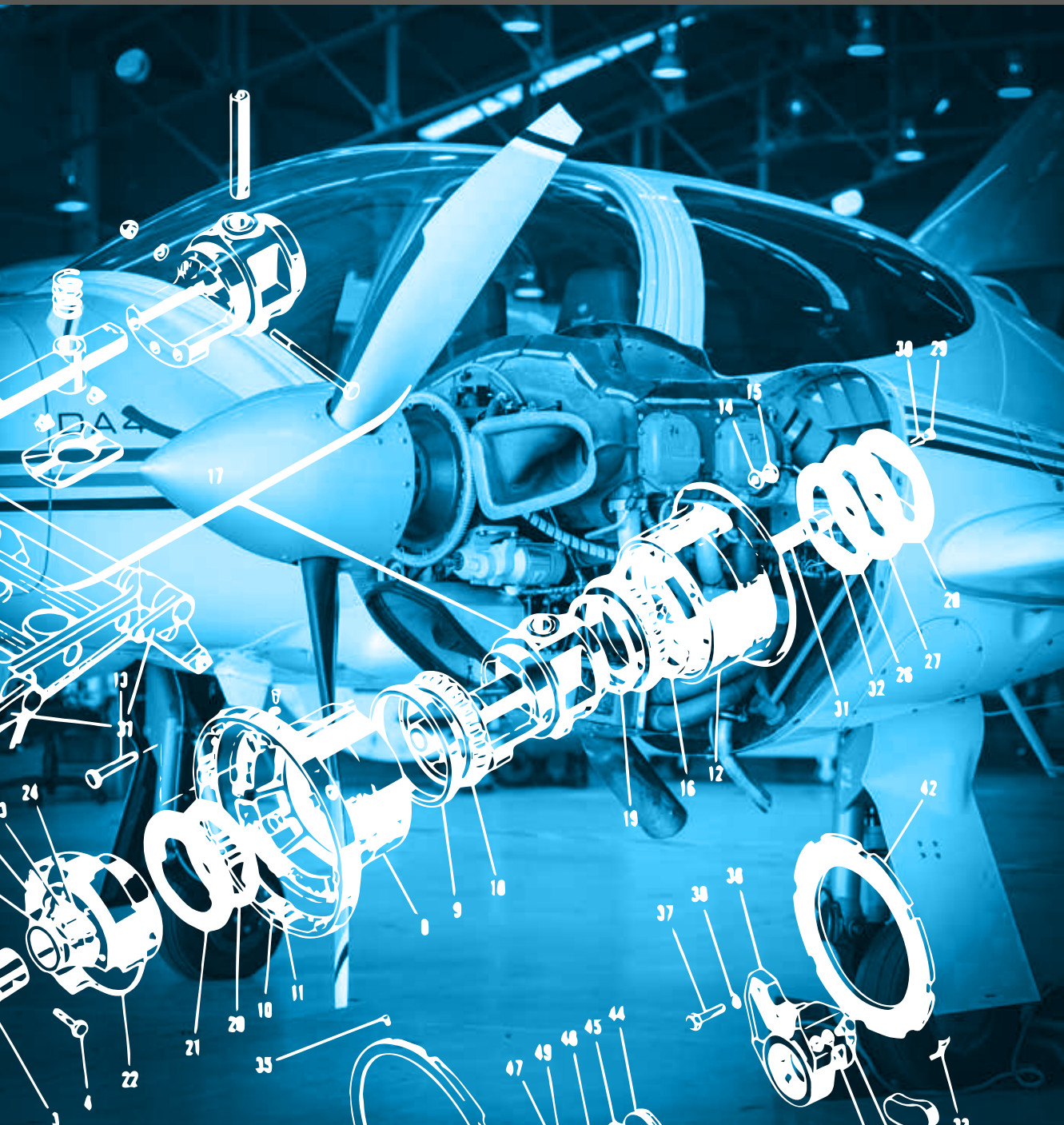
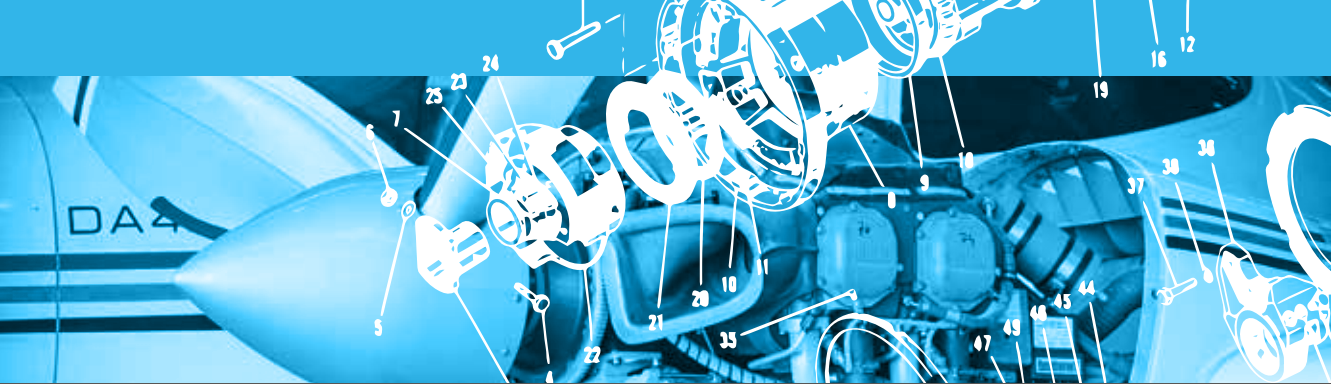




Australian Government
Civil Aviation Safety Authority

maintenance guide for **pilots**





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Section 1

The maintenance release

Introduction

The maintenance release records the current legal airworthiness status of the aircraft. It is the document which sits at the top of the pyramid of required maintenance inspections, maintenance manuals, airworthiness directives, systems of maintenance and maintenance schedules.

The pilot, the registered operator, licensed aircraft maintenance engineer (LAME), the certificate of registration (C of R) holder, the maintenance controller and the hirer of the aircraft all have an interest in the recent past maintenance history, and the flying time in hours (and days) available before the next required aircraft maintenance action. The maintenance release contains this information, allowing the pilot, LAME and so on to make informed decisions about the aircraft's condition and suitability to operate.

When a person issues a maintenance release they are certifying that:

1. All the required maintenance has been performed.
2. The maintenance has been performed in accordance with approved maintenance data.
3. The aircraft was considered airworthy at the time the maintenance release was issued and should remain airworthy for the period of release, which is usually 100 hours, and/or twelve months, whichever comes soonest, and providing that all maintenance indicated on the 'required maintenance' section of the maintenance releases is performed when required and all other related activities are carried out to the required standard.

At first sight this can seem daunting, but it need not be.

How does the maintenance release work?

The Civil Aviation Act and other regulations require all aircraft to have a current maintenance release before any flight is begun. The maintenance release is issued for the time indicated in the CASA-approved system of maintenance chosen by the certificate of registration holder from a list outlined in the civil aviation regulations.

Maintenance must be performed at regular operational and calendar intervals at the times specified in the system of maintenance.

The maintenance release is a 'mini' technical record. All flying times, daily inspections and maintenance defects must be recorded on the maintenance release, so that the next person who intends to fly the aircraft can be aware of any problems and see if there is enough time left on the release for the intended flight.

When an aircraft has been flying for a specified time, it becomes due for a periodic inspection. This is usually one year from the date of the last periodic inspection, or 100 hours time in service (TIS).

If the maintenance release is out of time (accumulated flight hours have reached the period of release, e.g. 100 hours, or the date/calendar period specified on the release), is cancelled or suspended for some reason, or records damage or an unserviceability that indicates that maintenance (or repair) is required before further flight, then the aircraft must not commence a flight unless CASA grants specific permission. The maintenance release must also be carried in the aircraft on every flight unless CASA has given an approval not to carry it.

In some cases an electronic maintenance release is approved. These will have specific requirements; for example, the pilot in command must have access to all the required information before accepting the aircraft for a flight. The same applies to maintenance staff before they perform any maintenance.

The maintenance release

The maintenance release—section by section (CASA CAAP 43-1 and form 918).

Broadly, there are three main parts to the maintenance release, each with a different purpose and requirements. Each of these three parts is then split further into sub-sections requiring specific information.

Each section of the maintenance release is numbered; for example, **section 2** asks for the specific aircraft type.





Part 1

Part 1 sections are numbered from 1 to 18a, as indicated in the table above.

The purpose and specific requirements of these sections are:

Section 1

This area must contain the words 'maintenance release', or other words approved by CASA, indicating the form's name and purpose.

Section 1a

This must contain a unique number for the specific maintenance release, ensuring there is a single path back to the book it was taken from (there will be a 'carbon copy' at the maintenance facility that did the maintenance) and is also part of the fingerprint to enable you to trace the maintenance release back to the person who issued it.

Section 2

This indicates the specific type of aircraft the release is issued for, such as Piper PA-32. This should contain full details of the make and model of the aircraft, as specified by its manufacturer, not the aircraft's common name. For example, as above – Piper PA-32 in full, not Cherokee or PA-32.

Section 3

The aircraft's registration designation is found here. The prefix VH- (indicating an Australian aircraft) is usually pre-printed on the form, and the person issuing the release must write in the appropriate letters specifying exactly which aircraft is being released. These letters should be taken from the marks on the aircraft itself and verified with the certificate of registration details. If they are different, find out why! The certificate of registration holder should also notify CASA of this.

Section 4a

The date on which the maintenance release expires. This should be 12 months from the day on which it was issued, or any other date specified by CASA. Pay special attention to the year, because a significant number of releases are unintentionally given dates which mean they expire on the same day they are issued!

Section 4b

The release may also expire after a total time-in-service (TTIS) indicated in this box.

The TTIS indicated here will normally be 100 hours from the TTIS at the time of maintenance release issue; for example, if the periodic inspection is carried out at 1221.7 hours TTIS, the expiry will be 1321.7 hours.

Some exceptions to this can be approved by CASA. In the case of a light aircraft (B class), operating only in private or aerial work, this could be more than 100 hours.

In some cases, CASA may also approve different time intervals (e.g. 150 hours) between inspections.

Whenever the time in service between periodic inspections is indicated in the approved system of maintenance, you must use this figure. Add this to the TTIS when the aircraft is released.

The TTIS is the accumulated time the aircraft has flown from manufacture. For each flight, the time-in-service (TIS) is 'the time between when the aircraft takes off on a flight and lands at the end of the flight'.

You must measure this time accurately and record it in Part 3 of the maintenance release, because it is the main way of determining when periodic maintenance is due.

Section 5

The details of the organisation or person issuing the maintenance release are recorded here.

This will usually be the Civil Aviation Regulation (CAR) 30 organisation that performed the inspection on the aircraft (if the company that carried out the maintenance is Top Notch Aviation, Certificate of Approval (CAR 30) Number 111111, the person who signs or issues the release does so 'for and on behalf of' the organisation authorised to carry out the maintenance). This signature must be accompanied by the person's licence number and the date the maintenance release was issued.

Section 6

The TTIS of the aircraft at the time the maintenance release was issued is found here. This number is taken from the aircraft's technical records (aircraft log books) and can sometimes be checked against the mechanical recording system if one is fitted. Report any discrepancy to the C of R holder and CASA for investigation.

Section 7

The time when the maintenance release was signed.

Section 8

The date on which the maintenance release was signed.

Section 9

The place where the maintenance was performed. This is particularly important if the maintenance organisation has more than one maintenance location. Write the actual location here, not the location of the main base; that is, if a maintenance organisation based in Brisbane carries out periodic maintenance on an aircraft in Melbourne, write 'Melbourne' in this space.

Section 10

The authorised person signs here.

Remember: this person is not signing for themselves, but as a representative of the approved maintenance organisation carrying out the maintenance.

This person (signatory) must be listed as approved by the organisation in the procedures manual, or system of quality control. This person must be the LAME coordinator of the maintenance inspections (as per Schedule 6) or a person authorised by CASA.

When the person signs they are confirming that:

1. all the maintenance was carried out correctly in accordance with civil aviation regulations.
2. all the maintenance has been certified.
3. the log book has been filled out and signed.
4. any maintenance required before the next periodic inspection is recorded in the maintenance required section (Section 16). Note that while the maintenance release is issued for the aircraft, this section may require an engine overhaul halfway before the next 100-hourly inspection.
5. all things being equal, if no other maintenance is required to be carried out, there are no unforeseen incidents, and the maintenance required is performed, the aircraft should remain airworthy until the next periodic inspection.
6. the maintenance release has been completed correctly.
7. they are authorised to sign.
8. a current certificate of airworthiness is applicable to this aircraft.
9. they coordinated the maintenance inspection and were present the whole time it was performed.

Section 11

The person signing writes their personal AME licence number or authorisation number in this section.

Section 12

The C of R holder has decided previously what system of maintenance will apply to their aircraft. They tell the maintenance provider what this system is by either:

1. providing a current complete approved system of maintenance to the maintenance organisation
- or
2. including a 'log book statement' indicating the system of maintenance in the aircraft's logbook. If the system of maintenance is neither the CASA system nor the manufacturer's, indicate this to the maintenance organisation and to the person performing the daily inspection before the inspection starts.

The system of maintenance and the log book statement will tell maintenance personnel what maintenance should be carried out and when.

Some of this maintenance will be for the radio, electrical, navigation and instrument systems, and will indicate whether the aircraft is IFR or VFR.

If the system indicates that the aircraft requires maintenance for IFR, carry out this maintenance and cross the IFR box on the maintenance release, leaving the others blank. You can use an IFR aircraft in VFR operations, but a VFR aircraft cannot be used in IFR.

Section 13

Do not confuse the operational category of the aircraft with its airworthiness category.

Operational categories are:

1. Private
2. Aerial work
3. Charter
4. Regular public transport (currently CAR 206 1(c) RPT operators are under PART 145/42 rules and so will not be using the CASA maintenance release).

Take, for example, the Thrush. Its airworthiness category is restricted agricultural, but its operational category is aerial work, not agricultural.

The person issuing the maintenance release obtains this information from the system of maintenance and the C of R holder.

You may write more than one category in this section, provided they are not mutually exclusive; for example, you can combine private, aerial work and charter. Some airworthiness requirements (e.g. fire extinguishers) apply to various categories, so all the necessary maintenance must have been carried out before the maintenance release is signed.

If the C of R holder is using the aircraft for charter but only the maintenance for the private category has been carried out, 'private' must be written in this section.

Section 14

Write the maintenance schedule or system of maintenance used for the periodic inspection here, to inform pilots and other people carrying out maintenance on the aircraft.

The person completing this section of the maintenance release should include the applicable system of maintenance as detailed in the 'log book statement' Part 1, or from the approved system itself. For example, if ABC Airlines has a system of maintenance called the ABC System of Maintenance, ABC System of Maintenance will be written in this section. If the CASA system of maintenance is used, 'CASA System of Maintenance' and/or 'Schedule 5' will be written in this space. If the manufacturer's system of maintenance is used, record this.

The operator of transport category certificate of airworthiness must have a system of maintenance as per CAR 39 and cannot use Schedule 5.

Section 15

Each separate item listed in the 'maintenance required' column (Section 16) is given an item number in order of entry. Enter this number in the Section 15 column, and details of any maintenance required while the maintenance release is in force.

Section 16

The maintenance required is not limited to ADs. It can include any maintenance the person issuing the maintenance release feels needs to be carried out. For example, if during the inspection an item is found to be just within the manufacturer's published limits, the aircraft can be released, but if experience tells the maintenance person that it will probably need rectification before the expiry date, the person releasing the aircraft can then list the inspection in the maintenance required column to ensure that it is done.

All maintenance in this section is mandatory unless it is specified as 'recommended'.

Be aware that statements such as 'recommended' mean that the operator can choose to ignore the request (e.g. oil and oil filter change recommended at 50 hours TIS or six months).

However, recommended maintenance should ideally be carried out as specified to take efficiency and reliability beyond minimum requirements.

Section 17

Write the date, TTIS or TIS when the maintenance is due in this column.

For a date, this means midnight on that day; while for TTIS or TIS it means just that.

After this the maintenance release ceases to be in force (is suspended) and the aircraft cannot be flown until the stipulated maintenance is carried out and certified.

Section 18

The person who performed the maintenance must enter a certification stating that the requirement was complied with, and entered in either Part 2 of the maintenance release (Section 20), or in the aircraft log book, in this section

(See Section 2 of this guide and CAR 1988 Schedule 6 for certification requirements.)

Remember that only appropriately approved persons may certify for maintenance and transfer the endorsement into Part 2 of the release. The person authorised to perform the maintenance must write the details in the aircraft log book.

Section 18a

Enter the date on which the maintenance is performed here.

Part 2

[illegible]

A signature in Part 2 of this Maintenance Release certifying for the completion of maintenance shall constitute a certification required by Civil Aviation Regulation 42ZE.

Sections 19, 20 and 21

If the defect or damage is major, the aircraft will be grounded and the maintenance release suspended. If the defect or damage is less significant, the aircraft may be permitted to fly, but restrictions or conditions may apply. For example, if an instrument required for IFR was to become unserviceable but this instrument is not a requirement for VFR, the aircraft can fly VFR. In this case an endorsement should be written on the release. 'Aircraft VFR only, refer item no. X', is all that is required.

This will tell any person likely to fly or perform maintenance on the aircraft that the aircraft is VFR and the instrument is unserviceable. Once the defect or damage is rectified, a certification can then be made declaring the aircraft airworthy and saying that IFR is now permitted.

It has always been difficult for pilots to determine if a defect or damage is major or not. A major defect or damage is defined as 'any defect or damage in an aircraft or aircraft component which if it were to be inoperative the aircraft's airworthiness, safety or operational capability will be compromised'.

Pilots can determine a defect or damage using:

1. The operator's maintenance personnel
2. The local maintenance personnel
3. The Civil Aviation Orders (CAO)
4. The minimum equipment list (where approved)
5. The flight manual (mandatory equipment)
6. Their own experience, provided maintenance personnel verify this
7. Local CASA regional office inspectors.

Section 19

The person making the endorsement writes the endorsement number in here.

Section 20

Write the details of the defect or damage in this section, giving as much detail as possible.

If there is not enough space, you can copy Parts 2 and 3 of the maintenance release and attach them to the original document, providing they are clearly marked as being part of this particular maintenance release and attached securely to it.

In the case of an abnormal flight or ground load, endorse this section with the statement 'This aircraft is not airworthy'. The aircraft is now grounded until the defect is investigated and appropriate action taken by maintenance staff.

As mentioned previously, endorse all defects, regardless how minor, in this area. Even seemingly trivial minor defects can indicate problems with an entire system. For example, if a series of light bulbs blows constantly, it could indicate an over-voltage in the lighting system.

Section 21

The person endorsing the maintenance release signs and dates the endorsement in this section.

This does not indicate clearing of the endorsement, but allows the person addressing the endorsement to know who made it and when.

Since 1988, the maintenance release has formed part of the aircraft's permanent record and is retained in its logbook.

Section 22

The person clearing the endorsement writes the item number of the endorsement in this area for cross-reference.

Section 23

Use this section for clearing the endorsement. The person assessing the endorsement or performing the appropriate maintenance writes the details in this area.

An authorised person—a person who has received permission from CASA to perform the maintenance—must make the clearing endorsement. This could be the pilot, but in most cases would be an appropriately licensed aircraft maintenance engineer, or the holder of a maintenance authority for the work.

If this 'authorised person' is a pilot, they must hold a full licence, unless they also hold an AME licence or a maintenance authority.

The Civil Aviation Regulations in Schedule 8 list the maintenance a pilot may perform. Note that this applies only to 'B' class aircraft.

For A class or transport category aircraft, the maintenance permitted by the pilot is listed in the system of maintenance for that specific aircraft.

The person assessing a defect can only do so for maintenance they are permitted to perform.

Various documents are available to help the person assessing the defect to reach a decision:

1. CAO 20.18 for mandatory equipment including radio and navigation requirements
2. CAO 20.4, for oxygen equipment requirements
3. CAO 20.7.0, CAO 20.7.1, CAO 20.7.1B, CAO 20.7.2, CAO 20.7.4, for weight and balance requirements
4. CAO 20.11, for emergency life saving equipment requirements
5. The aircraft's approved flight manual
6. The AOC's operations manual
7. The approved minimum equipment list (MEL) for the aircraft, if available
8. Permissible unserviceability conditions and instructions.

Not all these documents will be available to a pilot at all times, but you should make every effort to access as many of them as possible before making the clearing endorsement, so that your decision to continue the flight is soundly based.

Maintenance staff have access to the approved maintenance data to help make their decisions; and can be asked for advice by non-maintenance staff as required.

Always use any/all available information and resources.

Section 24

The person making the clearing endorsement signs here. The clearing endorsement should include the licence number of the person clearing the endorsement and the date on which the endorsement was cleared.

If the person clearing the endorsement is signing 'for and on behalf' of an approved maintenance organisation, they should indicate this, giving full details (Certificate of Approval number and name of organisation), in addition to the personal information required above.

A typical endorsement would be 'Stephen Zxcovich, Lic No L123456, for and on behalf of ZXC Aviation Auth No NSW11234, 20/05/12'.



Part 3

DAILY INSPECTION CERTIFICATIONS AND AIRCRAFT TIME-IN-SERVICE

Part 3

Date	Daily Inspection Certification (Pilot, LAME, MA)		Aircraft Time in Service				Cycle Totals, e.g. Landing/Start		
	Signature	Licence no.	Flight Time Hrs Min	Progressive Hrs Min	Total Hrs Min	L	S		
25	26a	26b	27a	27b	27c	27d	27e	27f	27g
	Brought Forward:				2371	00			
29/5/09	N. Bloke	123456	7	00	2378	00			
4/6/09	N. Bloke	123456	2	00	2380	00			
1/7/09	F. Bloggs	246800	4	35	2384	35			
7/7/09	E. Man	130068	3	20	2387	55			
20/7/09	M.Citizen	196802	2	15	2390	10			
30/7/09	M.Citizen	196802	3	50	2391	00			
			3	50	2394	00			
1/8/09	N. Bloke	123456	1	00	2395	00			

A signature in Part 3 of this Maintenance Release certifying for the completion of maintenance shall constitute a certification required by Civil Aviation Regulation 422E

Part 3 of the maintenance release serves a dual purpose: to certify for the daily inspection and to record the total time-in-service (TTIS) of the aircraft and time-in-service (TIS) for each day's flying.

Section 25

Write the date on which the daily inspection was carried out here. The daily inspection must be carried out and certified before the first flight on each day the aircraft is flown.

If for some reason the aircraft is not flown, you need a further inspection and certification on the next day. A daily inspection expires at midnight on the day it is performed. For example, if an aircraft has a daily inspection at 0800 on one day, has a final flight finishing at 2359 on the same day, and is to fly again at 0100 the next day, a daily inspection is required before the 0100 flight.

Sections 26a and 26b

The person who performed the daily inspection signs next to the date on which the inspection was carried out, and writes their licence number (either LAME or pilot) in the space provided.

This certification is compulsory. All pilots, except student pilots must certify for the daily inspection before the aircraft's first flight of the day. Pilots may not supervise any person performing maintenance. Approved pilots must perform the inspection themselves. An inspection including a daily inspection is considered maintenance.

If a student on a navigational exercise is forced to land and then fly out the next day, an authorised person (either another pilot or a LAME) must perform and certify a daily inspection before the return flight.

In some instances an authorisation can be obtained from CASA before commencing the exercise. The student must then perform the inspection and certify for it.

If there is no signature for a daily inspection beside the date when the aircraft is to be flown, the aircraft must not fly.

Sections 27a, 27b, 27c and 27d

These are the record of the time-in-service of the aircraft. The minimum requirement is to record the total hours flown by the aircraft at the end of each day's flying. You must enter this after the last flight of each day.

Time-in-service (TIS) is defined as the time between when the aircraft first takes off and when it lands at the end of the flight. It can be measured by any means available, provided it is accurate. You can use your wristwatch, but many aircraft have a mechanical means of measuring TIS, which you must use if fitted. In some cases the TIS is measured by the engine tachometer. When this method is used, the time will be greater than that indicated by the above definition. Do not adjust this time under any circumstances. While the additional time for run-up and taxi is lost, applying an adjustment factor will cause error and could lead to inaccuracies affecting aircraft components with a defined overhaul life, such as the engines.

Time can be measured in hours and minutes; for example, 1hr 27m, or as a decimal of an hour (such as is indicated by most mechanical measuring systems). In either case, the time you enter in the maintenance release should be consistent with other entries, including the figures 'brought forward'. The person issuing the maintenance release enters the TTIS brought forward in Section 27d.

Sections 27e, 27f and 27g

The final sections of Part 3 of the maintenance release are for recording specific information required by the aircraft's system of maintenance.

The aircraft manufacturer or service requirements may need this to measure the life of certain components. Landings, for example, are usually the measurement for undercarriages (at 17,000 landings the undercarriage is due for change or overhaul). Other indicators that could be listed here are cycles for fuselage time on pressurised aircraft, starts for engine starters etc.

Conclusion

The maintenance release is the primary source of maintenance information for pilots, owners and maintenance personnel. Used correctly it can give you all the information you need to determine the suitability of a particular aircraft for your operational needs. It is a legal document, so the regulatory requirements should be met at all times. As you can see from this guide, there are important reasons for these requirements – your and your passengers' safety, and even lives.

Once you know what to look for, maintenance holds very few secrets.



Section 2

Certification for maintenance

References

Civil Aviation Safety Authority (CASA), Civil Aviation Regulations (CARs):

CAR42G

CAR42ZC

CAR42ZE

Schedule 6 CASA system of certification for the completion of maintenance (Part of the CARs).

What maintenance must be certified?

All maintenance must be certified for.

CAR42ZE gives direction on certification of completion of maintenance.

CAR42ZC lists those who are permitted to carry out maintenance, and under what circumstances.

What must be included in a certification?

For a certification to be valid, it must contain the following:

1. signature
2. licence number
3. date

(These and other requirements are laid out in CAR Schedule 6, 2.5.)

What types of certification am I likely to encounter and where do I certify?

Daily inspection certification

The daily inspection is classified as maintenance and certification for the daily inspection is made on the CASA maintenance release or approved alternative.

However, aircraft may have a dedicated technical log for recording of flight hours etc. In this case, the daily inspection certification would be made in the technical log.

Certification for maintenance

In the case of other pilot maintenance, certification is usually made on the maintenance release or technical log, or in the aircraft log books.

Certification for maintenance is more than a simple signature. A very brief statement such as 'fixed', or 'part replaced', does not meet the requirements.

For example, the engine is running rough. After the spark plugs are cleaned or replaced, the engine is ground run and the fault is no longer evident. In signing off the defect, the words: 'Spark plugs replaced (in accordance with) e.g. Piper MM (maintenance manual) No. XXX, Para 12, A/C TTIS 1235.9, part No. XXX' are written on the maintenance release. The person who changed the spark plugs then certifies it.

Certification for independent inspection on flight controls CAR42G(2)

As the holder of a pilot licence (other than a student), you may be asked to perform an independent inspection. This type of inspection is required each time any part of a flight control system is assembled, adjusted, modified or replaced. This secondary inspection is also maintenance and must be certified for.

Supervision

A pilot may NOT supervise anyone performing maintenance and must not certify for work performed by any other person. (CAR42ZC).

Further information on certification

1. Refer to the CARs as per the references in this section.
2. CASA's 'Maintenance guide for owners/operators' is available in hard copy, or you can download it from the CASA website: www.casa.gov.au by using the search function with the text 'maintenance guides'.



Section 3

Daily inspection

15

Introduction

The daily inspection is one of the most important inspections for an aircraft in service. It is the only thorough inspection between periodic inspections and is the last real opportunity to inspect the aircraft to ensure that:

- a. it is airworthy and fit to fly
- b. all mandatory ADs etc. have been carried out
- c. its equipment is serviceable and suitable for the day's particular operation/s.

Note: a daily inspection is maintenance and therefore must be:

- a. certified for (Refer to CAR (1988) 42ZE)
- b. certified for by an authorised person
- c. carried out in accordance with approved data (Refer to CAR (1988) 42V).

This section will take you through a daily inspection utilising CAR Schedule 5. You must perform the daily inspection before the first flight on any day the aircraft is flown.

The daily inspection is equally important for maintaining the airworthiness and usefulness of an aircraft as the periodic one. If any inspection is not carried out correctly, the airworthiness of the aircraft is in doubt.

The daily inspection is an important part of maintenance, and together with the 'pre-flight' or 'walk-around', ensures the aircraft not only meets operational requirements, but also continues to be airworthy and as safe as possible for flight.

The major difference between the daily and 'pre-flight' inspections is that the 'daily' is a maintenance inspection. An authorised person must therefore carry it out, and

this person must also certify for it, usually in the current maintenance release. The authorised person for the purposes of performing a daily inspection is defined in CAR 42ZC as either a LAME in the airframe or engine categories; or a pilot who is endorsed on the type (not a student pilot); or the holder of an appropriate maintenance authority issued by CASA for the purpose; or a pilot authorised to do so in the operator's maintenance control manual or equivalent.

On the other hand, the pilot in command is the only one who can perform a walk-around, and the walk-around is not signed for. Its purpose is to inspect the aircraft to ensure it is safe, that nothing untoward has occurred since the daily inspection, and to determine if flight requirements can be met.

The daily inspection must be carried out strictly in accordance with the aircraft's approved maintenance schedule, which could be CAR Schedule 5; the manufacturer's system of maintenance; or the registered operator's approved system of maintenance (SoM). An 'A' class aircraft can only be maintained to the registered operator's approved system of maintenance (SoM).

Note: This is not applicable for class 'A' aircraft that are operated in regular public transport (RPT) category. These aircraft are now maintained under the CASR Part 42/Part 145 rules.

The pre-flight or walk-around inspection is a compilation of the requirements of several sections of legislation, namely: CAR 242, CAR 244, CAR 245 and CAO 20.2. There is no actual reference to a specific pre-flight. The 'pilot in command' must perform certain tasks 'before take-off'. Refer especially to the 'notes' in CAO 20.2 titled, 'Safety Precautions before Flight'. While none of these regulations require individual certification, they are still compulsory, and require due care and attention to detail.

It is not a requirement that only particular pilots can certify; for example, the chief pilot, or a senior commercial pilot; the legislation states that any pilot (not a student) can certify. This applies to all of the tasks outlined in CAR Schedule 8 for a 'B' class aircraft and those indicated in the manufacturer's, or C of R holder's approved system of maintenance.

The pilot must also report any defect found 'in a manner acceptable to CASA', that is, by endorsing the maintenance release.

Recording a defect on a piece of paper and giving it to the senior pilot or maintenance staff is not enough. Nor is telling them verbally about rectification of a defect. The pilot who found the defect must endorse it on the maintenance release (CAR 248) at the end of each flight.

Something to keep in mind while carrying out a daily inspection is that regardless of whether you are a pilot or a LAME, you are performing maintenance on the aircraft, so all the regulations dealing with maintenance apply.

[illegible]

Fig 1: Part 2 of the standard maintenance release. This is where all defects must be written.

You must use approved maintenance data when performing all maintenance, including a daily inspection. As CAR 42V states:

‘1. A person carrying out maintenance on an Australian aircraft must ensure that the maintenance is carried out in accordance with the applicable provisions of the aircraft’s approved maintenance data.’

So when carrying out a daily inspection, you must refer to the aircraft’s approved maintenance manual to determine both what is to be inspected and what specifications will apply; for example, fits, wear limits, movement limits, clearances etc.

The aircraft’s system of maintenance or maintenance schedule will generally tell the person performing the inspection only what to inspect and when. It will rarely indicate the required condition for the aircraft component to be considered airworthy. For pilots, this information is available from the maintenance organisation that looks after the aircraft, or a local maintenance engineer.

Regardless of what daily inspection schedule is required, some aspects are the same. For instance, the inspection must be planned, thorough, complete, meticulous, and performed in a logical sequence. The suggested sequence and what to look for can be found in the aircraft flight manual. As mentioned previously, the person who performs this inspection must also certify for it. Approved maintenance data must always be available and used without regard to who was actually performing the inspection. If there is any doubt, you must consult appropriate maintenance staff, so that the appropriate data can be interpreted.

Remember that the daily inspection is your last chance before an aircraft is flown to determine if it is airworthy and is safe for operation. Ultimately, the final decision is yours, once the appropriate data have been considered and entered. If pilots are unfamiliar with the aircraft, it is also advisable to seek guidance and training from maintenance staff.

The daily inspection needs to be performed in a systematic and thorough manner to ensure that nothing listed on the checklist is missed.

You will need a torch and a fuel-draining device to complete the daily inspection thoroughly.

Regardless of whether you are a pilot or a LAME (CAR 42ZC), the current maintenance release is the place to start your daily inspection. The areas to take special note of are:

- a. The time in service (TTIS) and date when the maintenance release expires (Part 1)
- b. Any maintenance due. Will maintenance be required during your planned flight? Is any maintenance due now? Is all required maintenance certified for? (Part 1)
- c. Any endorsements. Are they major? How will your operations be affected? (Part 2)
- d. The TTIS in Part 3 should be compared to the TTIS figure in the ‘expires’ box in Part 1. Ask: is the maintenance release going to expire during the flight?

You should inspect the aircraft only after reading the current maintenance release. Take a copy of the schedule with you.



Fig 2: Recommended tools to carry with you.



SCHEDULE 5 CASA maintenance schedule

(subregulation 2 (1), definition of **CASA maintenance schedule**)

Part 1—Daily Inspection

- 1.1 An inspection (in this Part called a **daily inspection**) must be carried out on the aircraft before the aircraft's first flight on each day on which the aircraft is flown.
- 1.2 A daily inspection must consist of the making of such of the checks set out in the table at the end of this Part as are applicable to the aircraft.

TABLE OF CHECKS INCLUDED IN A DAILY INSPECTION

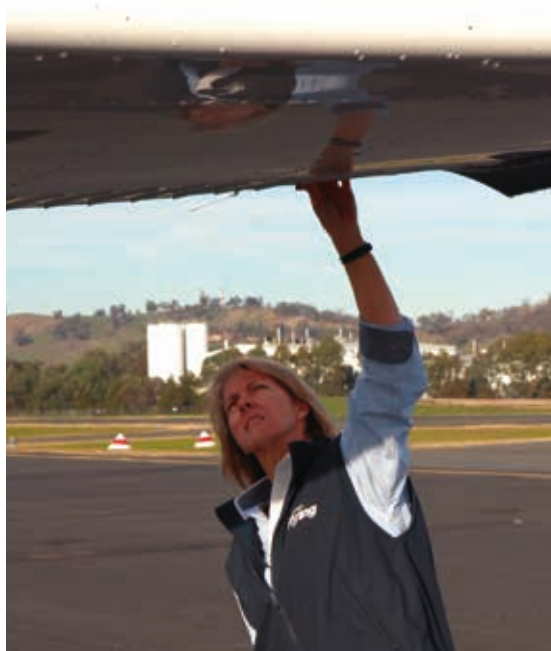
Section 1—General

- (1) *Check* that the ignition switches are off, the mixture control is lean or cut off, the throttle is closed and the fuel selector is on.
- (2) *Check* that the propeller blades are free from cracks, bends and detrimental nicks, that the propeller spinner is secure and free from cracks, that there is no evidence of oil or grease leakage from the propeller hub or actuating cylinder and that the propeller hub, where visible, has no evidence of any defect which would prevent safe operation.

Fig 6: Example of a maintenance schedule.

Summary—the daily inspection

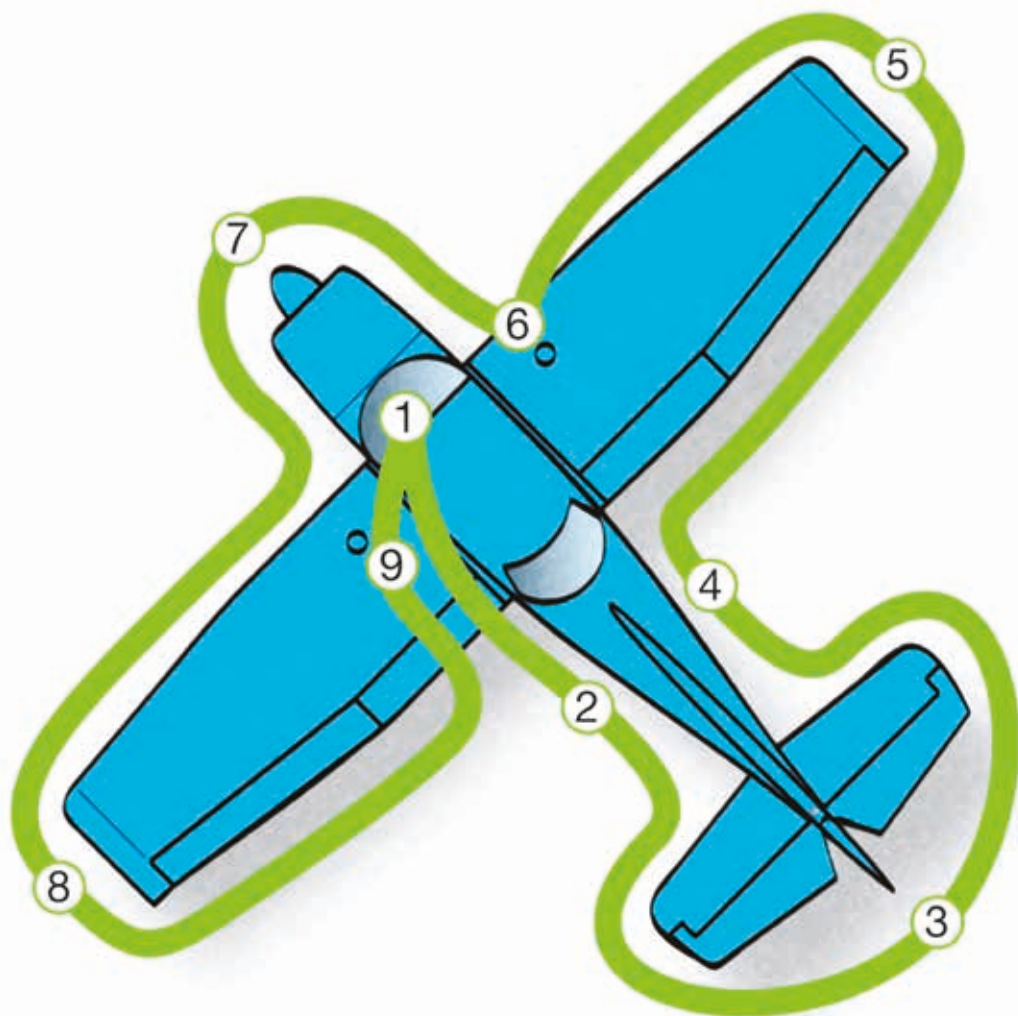
- Perform the daily inspection before the first flight of each day the aircraft is flown.
- It is not a pre-flight inspection or walk-around.
- It must be signed for in Part 3 of the maintenance release.
- An authorised person must perform it.
- They must use approved maintenance data.
- They should complete a checklist from the system of maintenance.
- Perform the daily inspection in a systematic and thorough manner.



THE AIRCRAFT INSPECTION

The aircraft inspection is a systematic and thorough look at the aircraft in accordance with the appropriate approved schedule. It makes little difference where you begin your inspection, as long as you perform all areas of the schedule. Remember that you will be certifying for the inspection, which means that when you sign you are taking responsibility for having completed all of it.

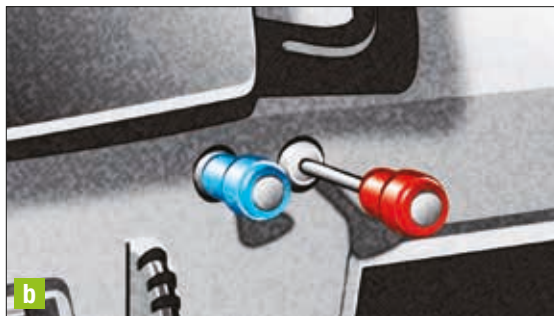
Ensure the daily inspection walk round is thorough and complete.



AREA 1 (cockpit & cabin)

For reasons of safety (yours and others) there are certain things that must be carried out in the cockpit before you start on the exterior. It is important that you physically check:

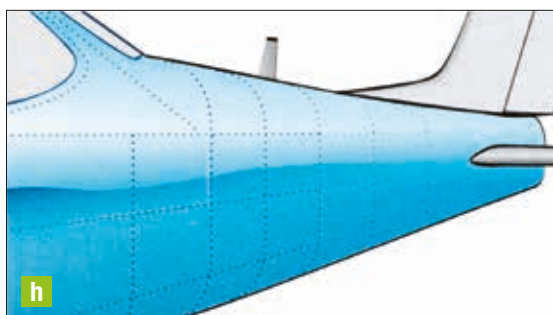
- a** The magnetos are OFF and all precautions are made to ensure they cannot be switched on accidentally. This also applies to the ignition switches for gas turbine engines;
- b** Fuel is cut off to the engine, i.e. mixture control in IDLE CUT OFF;
- c** Locks are removed
- d** COCKPIT—check all instruments for damage, security and unusual readings; check all engine controls for ease of operation; check fuel selector valve for ease of operation and damage; check all flight controls for ease of operation, including trim system; run trims to full travel in all directions, looking outside to ensure the actual tab moves. Turn power on and check all lights and warnings as required in the operator's handbook.
- e** INTERNAL FITTINGS—check all seats and seat belts for security, damage and operation, check fire extinguishers, life vests and rafts for date when due for overhaul/ replacement.

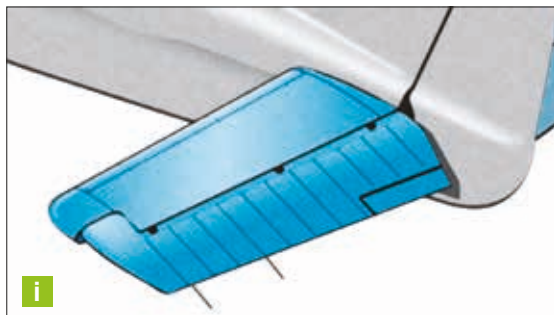


AREA 2 (external fuselage)

After ensuring your safety, you can now walk to a convenient part of the external structure of the aircraft and begin your inspection. You must be back at this point when the inspection is completed.

- f** WINDOWS—look for damage, crazing, cracks, colour changes, wipers, security, drains and clear vision areas.
- g** ALL DOORS AND HATCHES—check for damage, security and operation, particularly all locks.
- h** FUSELAGE—look for damage, screws missing from panels, buckling, security of aerals and drains.

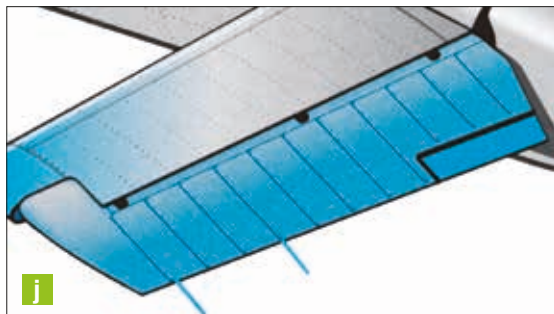




AREA 3 (rear fuselage)

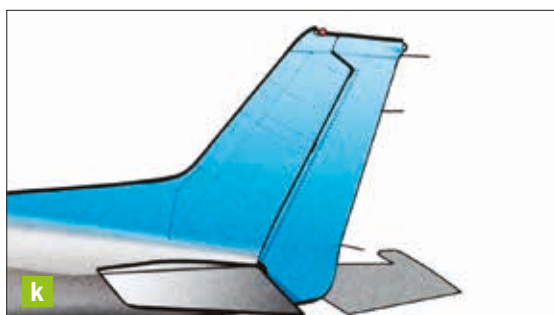
i EMPENNAGE—Check horizontal stabiliser for damage and security, buckling and control surfaces.

j ELEVATORS AND TRIM—look for damage and security, attaching bolts, nuts and safety pins. Check the trim tabs are secure. Check all bonding strips are not broken and are secure. Check the static wicks are present, secure and not damaged.



k FIN—check for security, damage and buckling.

RUDDER—check for damage and security; check trim for damage and security, attaching bolts, nuts and safety pins. Remove gust locks.



l FIN LIGHT



AREA 4 (external fuselage)

Inspect the right side of the rear fuselage as you did in Area 2 : h

- m** Inspect door and hatches on the right-hand side as you did in step Area 2: g

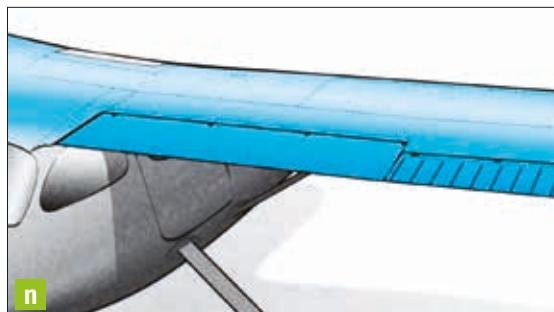


AREA 5 (wings, flaps, lights, pitot tubes)

THIS PROCESS OF INSPECTION IS THEN REPEATED ON THE OTHER SIDE OF THE AIRCRAFT (AREA 8).

- n** WINGS—upper and lower surfaces and leading edges for damage, loose or missing rivets, flap and aileron attach bolts, nuts and safety pins, panels loose or screws missing, torn de-icer boots, no leaks (fuel);

Disconnect wing tiedowns.



- o** check pitot static tubes for blockages, navigation; and anti-collision lights.



AREA 6 (fuel caps, fuel drains, main undercarriage)

THIS PROCESS OF INSPECTION IS THEN REPEATED ON THE OTHER SIDE OF THE AIRCRAFT (AREA 9).

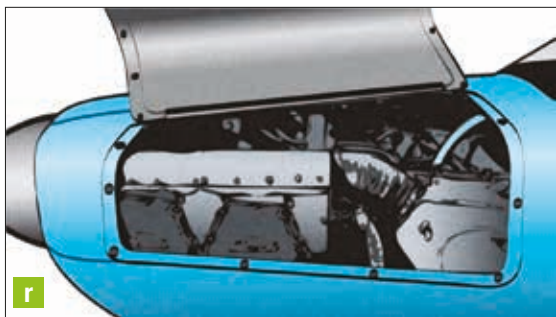
- p** FUEL CAPS—looseness, locks closed correctly (flush), fuel grade markings.



- q** MAIN UNDERCARRIAGE—security, damage, doors, bends, and leaks in oleo or fluid lines/fittings.

Check tyres for wear.



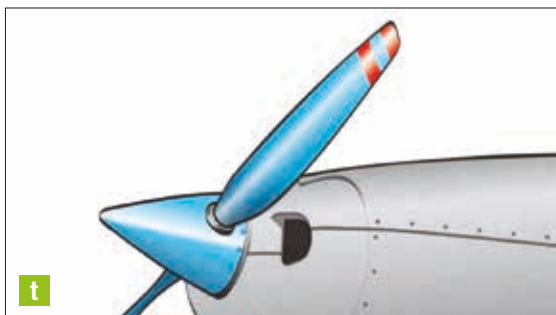


AREA 7 (engine & nose wheel)

r **ENGINES**—look for damage to components (a torch will be needed); cowls are fastened and locked; look for oil leaks and clean up what you can; check cowl latches for damage and locking devices; check all cowl screws are in place and tight; check oil level, refill as necessary (using only engine manufacturer's recommended oil); ensure oil dip stick and cap are secure and locked.



s **NOSE WHEEL AND UNDERCARRIAGE**—look inside doors for security and damage, tyre wear, steering mechanism, electrical switches and wiring (retractable gear), hydraulic leaks and loose fittings.

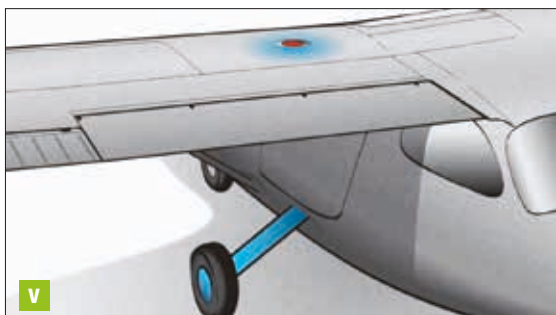


t **PROPELLER**—check for damage, security of blades in the hub; check for security of prop on shaft; check spinner for damage and security; check leading edge for damage. (If any is found seek advice from maintenance staff. A pilot is not permitted to perform any maintenance on a propeller).



AREA 8 (wings, flaps, lights pitot tubes)

u Inspect the left wing in the same manner as you did in Area 5



AREA 9 (fuel caps, fuel drains, main undercarriage)

v Inspect the left fuel cap etc in the same manner as you did in Area 6

This returns you to the start of the inspection

Part 3

[illegible]

A signature in Part 3 of this Maintenance Release certifying for the completion of maintenance shall constitute a certification required by Civil Aviation Regulation 42ZE



Appendix 1

SCHEDULE 5

[Subregulation 2 (1)]

CASA Maintenance Schedule

Part 1: Daily Inspection

- 1.1 A daily inspection must be carried out on the aircraft before the aircraft's first flight on each day on which it is flown.
- 1.2 A daily inspection must consist of making those checks that are applicable to the aircraft from the list in the table at the end of this Part.

Table of checks included in a daily inspection

Section 1: General

1. Check that the ignition switches are off, the mixture control is lean or cut off, the throttle is closed and the fuel selector is on.
2. Check that the propeller blades are free from cracks, bends and detrimental nicks, that the propeller spinner is secure and free from cracks, that there is no evidence of oil or grease leakage from the propeller hub or actuating cylinder and that the propeller hub, where visible, has no evidence of any defect which would prevent safe operation.
3. Check that the induction system and all cooling air inlets are free from obstruction.
4. Check that the engine, where visible, has no fuel or oil leaks and that the exhaust system is secure and free from cracks.
5. Check that the oil quantity is within the limits specified by the manufacturer for safe operation and that the oil filler cap, dipstick and inspection panels are secure.
6. Check that the engine cowlings and cowl flaps are secure.
7. Check that the landing gear tyres are free from cuts or other damage, have no plies exposed and, by visual inspection, are adequately inflated.
8. Check that the landing gear oleo extensions are within normal static limits and that the landing gear doors are secure.
9. Check that the wing and fuselage surfaces are free from damage and that the inspection panels, flight control surfaces and flight control devices are secure.
10. Check that the interplane and centre section struts are free from damage and that the bracing wires are of the correct tension.
11. Check that the pitot heads and static ports are free from obstruction and that the pitot cover is removed, or is free to operate.
12. Check that the fuel tank filler caps, chains, vents and associated access panels are secure and free from damage.
13. Check that the empennage surfaces are free from damage and that the control surfaces, control cables and control rods, where visible, are secure.
14. Check that the canard surfaces are free from damage and that the control surfaces, control cables and control rods, where visible, are secure.
15. Check that the flight controls, the trim systems and the high lift devices operable from the ground have full and free movement in the correct sense.
16. Check that the radios and antennae are secure and that where visible, radio units and interwiring are secure.
17. Check that the drain holes are free from obstruction.
18. Check that there is no snow, frost or ice on the wings, tail surfaces, canards, propeller or windscreen.
19. Check that each tank sump and fuel filter is free from water and foreign matter by draining a suitable quantity of fuel into a clean transparent container.
20. Check that the windscreen is clean and free from damage.
21. Check that the instruments are free from damage, legible and secure.
22. Check that the seat belts, buckles and inertia reels are free from damage, secure and functioning correctly.

Section 2: Additional items for agricultural aircraft

1. Check that the agricultural equipment is secure.
2. Check that the dump and fan brake mechanisms are free from obstructions and operate correctly.

Section 3: Additional items for seaplanes

1. Check that the hull and floats are free from damage, corrosion and water accumulation.
2. Check that the float attachment struts, bracing wires and attachment fittings are secure and free from damage and corrosion.
3. Check that the water rudder and its attachments are secure and free from damage and corrosion and that the water rudder has full, free and correct travel.

Remember that the daily inspection:

- is maintenance, so approved data must be used.
- is performed before the first flight of each day the aircraft flies.
- must be certified for.
- can be performed by LAMES and pilots.
- is your last chance to determine the airworthiness of the aircraft.



Section 4

Minimum equipment lists

Introduction

The current Civil Aviation Regulations (CARs) only permit an aircraft to fly when it is 'fit to fly' for the intended operation. This means that all the required instruments and equipment necessary for that operation are serviceable.

Civil Aviation Order (CAO) 20.18 titled, "Aircraft equipment – basic operational requirements" indicates that an aircraft used in charter or RPT:

- must have all its equipment serviceable before embarking on any flight.

This also applies to private and aerial work operations, the difference being that the equipment required is relatively basic. This is usually all that is required by the certification standard, as no fare-paying passengers are carried. However, the aircraft still needs to be safe 'for other airspace users and persons on the ground or water' so there are certain restrictions also placed on private and aerial work operations.

If all the equipment serviceability requirements of CAO 20.18 were required in every circumstance for every single flight then many flights would not actually happen.

This CAO makes a legal arrangement to permit normal operations where the aircraft has equipment that is not operating correctly, or at all, by allowing operators to have permissible unserviceabilities detailed in the form of an approved minimum equipment list (MEL).

Master minimum equipment lists

A master minimum equipment list (MMEL) is a compilation of a number of generic (to type) permissible unserviceabilities in an aircraft.

This list is usually compiled by a group of people from the original certifying country for the aircraft type. The group is usually made up of representatives from the manufacturer, the regulator and interested operators. This group meets just after the aircraft type is first certified and receives its type certificate.

It uses information from various areas such as the Maintenance Review Board and flying operation requirements to make a decision concerning operations with unserviceable equipment. The group will initially look at the certification standard for the type (e.g. CASR Part 23 light aircraft, or CASR Part 25 heavy aircraft), and determine how the designers have met these requirements.

This will set the minimum standard for mandatory equipment, that is, what the aircraft had to have to meet the certification standard. The group then considers what equipment is fitted in addition to the minimum requirements. This information, and the experiences of operators with this or similar aircraft, enables the group to make a decision as to what equipment can be unserviceable when the aircraft is dispatched for flight, while maintaining all airworthiness and safety requirements.

Finally, the group examines how each piece of equipment affects the aircraft's operation. From this information, the group specifies under what conditions the equipment may be unserviceable, for how long, and what actions the pilot and maintenance staff must take to ensure the problem does not compromise safety.

An RPT or charter aircraft must fly with all equipment serviceable, or find a means to gain permission to fly without the use of this equipment. An approved minimum equipment list (MEL) is one method. The International Civil Aviation Organization (ICAO) requires all commercial passenger-carrying operators using aircraft above 5700kg to have an MEL.

Australia is a signatory to the ICAO convention and the Civil Aviation Act Section 11 states that operators in Australia must meet ICAO requirements, as CASA determines through the regulatory framework. The ICAO requirements, Civil Aviation Act and regulations mandate an MEL for Australian RPT and charter operators.

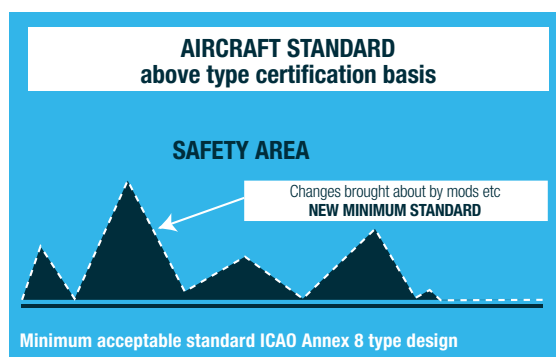


Fig 1. Indicates that there is an area between the certification and design standard and the actual standard of the aircraft type. It is in this area where the aircraft can be operated safely and be 'airworthy' with some of the equipment inoperative. The MMEL is based on the equipment fitted in this area.

The purpose of a minimum equipment list

As developed by the operator, the MEL is one of the tools that can be used by pilots and maintenance staff to determine the suitability of a particular aircraft for the operations it is programmed for. The MEL therefore must contain all the information necessary to make this decision. This will include specific operational and maintenance procedures in some detail.

Your own minimum equipment list

Every operator required to have an MEL should develop an individual list based on the master.

The master is generic, which means the operator should:

- Determine precisely what equipment is fitted to the aircraft.
- Compare this list with the master.
- Change the number fitted to reflect the actual aircraft configuration, where the equipment is reflected in the master.
- Justify fully, on safety and airworthiness grounds, why additional equipment not in the master should be included in your MEL.
- Develop, in consultation with maintenance staff, any maintenance procedures required (the master will generally indicate when a maintenance procedure should be developed – including this information is the operator's responsibility).
- Develop any required operational procedures through consultation with operational staff.
- Carefully read through the preamble, make appropriate changes and add information where required. However, note that the preamble in the master does not contain all the information required, giving only suggestions or examples. Special care should be taken, as many MELs do not reflect operators' or Australian requirements.
- Develop a procedure to be included in the operations manual, outlining the use and administration of the MEL.

The format of the MEL must meet CAAP 37-1 requirements. Using the MMEL or CAAP 37-1 format makes the approval process easier and more efficient. When applying, forward all information with the application, including any justification for inclusions that are not reflected in the master.

U.S. DEPARTMENT OF TRANSPORTATION			
FEDERAL AVIATION ADMINISTRATION		MASTER MINIMUM EQUIPMENT LIST	
AIRCRAFT:		REVISION NO: 4	PAGE:
BEECHCRAFT 60 SERIES		DATE: 11/23/93	27-1
SYSTEM & SEQUENCE NUMBERS	1. ITEM	2. NUMBER INSTALLED	3. NUMBER REQUIRED FOR DISPATCH
27	FLIGHT CONTROLS		4. REMARKS OR EXCEPTIONS
1.	Trim Tab Indicators	C 3 0	May be inoperative provided: a) Tab is visually checked for full range of operation, b) Tab operation is not affected and c) Tab is positioned to neutral prior to each departure and neutral position is verified by visual inspection.
2.	Flap Position Indicator	C 1 0	May be inoperative provided: a) Flaps are visually checked for full travel and b) Flaps are fully retracted before departurs.
3.	Electric Elevator Trim	C 1 0	(N)May be inoperative provided manual trim is operative and unaffected.

Fig 2. An example of a master minimum equipment list page (FAA). The information includes: the name of the item; the number fitted and the number needed for dispatch; the conditions to be met; any maintenance actions required; and, depending on whether it is designated an A, B, C, or D item, how long before it must be repaired. However, this is very generic, and you must remember that this master is designed for aircraft acquired directly from their manufacturer. Additional equipment or larger numbers of some items may have been fitted by the operator.

Unless approved through the CASR 21M process, the MEL is not a permission to operate the aircraft with equipment removed. You must submit CASR 21M approvals and consequent procedures with the application for MEL approval.

You must include all related operational and maintenance procedures in the MEL and place them at pilots' disposal. This will allow pilots to make informed decisions about the suitability of the aircraft for their flight.

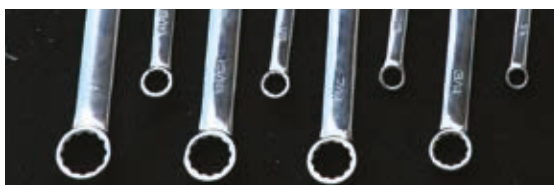
Maintenance procedures can only be carried out by an appropriate maintenance engineer or a pilot who has specific authorisation (from the regulation) for the maintenance indicated in the MEL.

If the MEL refers to documents that are not normally at the pilot's and maintainer's disposal, these must be included in the MEL in full.

For more information and a generic MEL, refer to CAAP 37 (1).

Single permissible unserviceabilities

The same rules apply to single permissible unserviceabilities (PU) as to an MEL—you must include a full justification based on airworthiness and safety with the application. For operations where an MEL is not a requirement, make reference to the appropriate MMEL to determine the general requirements. If the equipment is included in the master for the type, this can be used as justification.



Aircraft Type: DEHAVILLAND DHC-8		Revision No. 13		Page	
Aircraft Registration Mark: VH-ABC		Date: 1 August 1999		27-1-1	
1. ATA System and Item Sequence Numbers		2. NUMBER INSTALLED			
27 <u>FLIGHT CONTROLS</u> <u>CAT</u>		3. NUMBER REQUIRED FOR DISPATCH			
-1. Stall Warning System Pressure Indicator A -1. Pressure Indicator		2	1	4. REMARKS OR EXCEPTIONS (O) (M) One may be inoperative provided the system is deactivated.	
NOTE: Deactivating a stall warning system will deactivate the related FAST/SLOW indication on the ADI.					
Placard None required as a lit STALL WARNING caution light on the affected side indicates malfunction. A placard may be required regarding non-availability of FAST/SLOW indication on the ADI.					
Operating Procedures Prior to flight, test integrity of the STALL WARNING system by selecting the STALL WARNING TEST switch to the unaffected side; both shakers on pilot and co-pilot's control columns should operate.					
Maintenance Procedures 1. Pull the "STALL WRN & HTR" and "STALL XDCR HTR" circuit breakers for the affected side. Left Side: "STALL WARN & HTR 1" on left DC circuit breaker panel (L7). "STALL XDCR HTR 1" on variable frequency AC circuit breaker panel (left bus). Right Side: "STALL WARN & HTR 2" on right DC circuit breaker panel (R7) "STALL XDCR HTR 2" on variable frequency AC circuit breaker panel (right bus). 2. Make appropriate entry in the aircraft maintenance records.					

Sample page of an MEL.



Section 5

Special flight permits

Introduction

Approval of operations with an un-airworthy aircraft is possible through a special flight permit (CASR 1998 21.197). The flight or flights cannot be for commercial purposes and strict conditions will apply. Flights can also be approved under CAR 37 (1988), through the approval of permissible unserviceabilities. Flights under this type of approval will also have conditions imposed on them, but normal commercial operations are generally permitted.

1. Purpose of special flight permits (SFP)

1.1 Special flight permits are issued for specific aircraft by tail number or serial number for the purposes listed in 21.197(1). These are:

- a) Flying the aircraft to a base where repairs, alterations, or maintenance are to be performed, or to a storage facility
- b) Delivering or exporting the aircraft
- c) Production flight testing of a new production aircraft
- d) Evacuating the aircraft from an area of impending danger
- e) Conducting customer demonstration flights in new production aircraft that have satisfactorily completed production flight tests
- f) Assisting in searching for, bringing aid to, or rescuing people in danger
- g) Assisting during a state of emergency.

1.2 An SFP can also be used to authorise the operation of an aircraft

- at a weight in excess of its maximum certified take-off weight (from type certification),
- for flight within the normal range over water, or
- over land areas where adequate landing facilities or appropriate fuel are not available. The additional weight is limited to additional fuel, fuel tanks and navigation equipment necessary for safe flight.

1.3 Essentially SFPs are used where the aircraft needs to be flown for one of the purposes listed above, but maintenance requirements, damage or other regulatory requirements concerning the aircraft would normally render it un-airworthy. This does not imply that the aircraft is unsafe. If it could be considered unsafe the permit should not be issued.

2. Other requirements in the Civil Aviation Act and regulations that would normally be applicable:

- 2.1 21.197 also makes it clear that aircraft operating under SFPs are exempt from various requirements which would normally be imposed at other times. Some of these are:
- a) With the exception of operating for delivery or export the aircraft need not be registered. This implies that when a permit is issued for this purpose it must be registered. What it does not say is that the aircraft must be an Australian (VH) aircraft, but in consideration of the fact that the regulations are only applicable to Australian aircraft or foreign aircraft which are specifically mentioned in a regulation. What this is implying is that the aircraft needs to be VH registered or have a specific exemption against the requirements of Part 47, such as certain ultralight aircraft have
 - b) The aircraft need not have a current certificate of airworthiness in all cases. This does not refer to an experimentally designated aircraft, since this type of C of A fulfils its own requirements in this area
 - c) The aircraft need not have a valid maintenance release. In addition, if the aircraft is considered unairworthy the maintenance release in force at the time is suspended until the reason for the unairworthy condition is rectified. This subparagraph allows a method of flying an unairworthy aircraft to somewhere it can have the unairworthy condition rectified; otherwise it is immediately grounded.

For further information and guidance prior to submitting an application for a special flight permit, review CASA advisory circular AC21-09.



Australian Government
Civil Aviation Safety Authority

Form 725

Application for Issue of a Special Flight Permit
Refer to: AC 21-9

Privacy Statement: Any personal information you provide to CASA is protected by the *Privacy Act 1988* (Cth). CASA can only collect, use and disclose that information in accordance with that Act. CASA will use the information collected in this form for purposes associated with performing its functions under the *Civil Aviation Act 1988*, the *Airspace Space Act 2007*, the *Aviation Transport Security Act 2004* or the regulations made under those Acts. For full details on how CASA collects, protects and uses personal information, please refer to [CASA's Privacy Policy](#).

1. Aircraft Identification (As noted on the aircraft data plate and the certificate of registration)

Registration Mark VH- <input type="text"/> <input type="text"/> <input type="text"/>	Manufacturer and Manufacturer's Designation of Aircraft	Aircraft Serial Number
Place of Manufacture		Year of Manufacture

2. Details of Applicant

Name of Applicant/Applicant's Agent		ARN	<input type="text"/>
Postal Address			
State		Postcode	
Country			
Telephone		Facsimile	
Email			

3. Purpose for Special Flight Permit

<input type="checkbox"/> Ferry for Repairs, Maintenance, Storage etc.	<input type="checkbox"/> Delivery or Export
<input type="checkbox"/> Production Flight Test	<input type="checkbox"/> Evacuating Aircraft
<input type="checkbox"/> Customer Demonstration Flight (new a/c)	<input type="checkbox"/> Search and Rescue
<input type="checkbox"/> State of Emergency	<input type="checkbox"/> In Excess of MTOW

Note: See section 5 for other details required from applicant for the issue of the permit.

4. Proposed Itinerary for Purpose

Flight Details	
From: _____ (place)	To: _____ (place)
Period For Which Special Flight Permit Requested	
From: ____ / ____ / ____	To: ____ / ____ / ____
Proposed Departure Date: ____ / ____ / ____	

Section 6

Pilot maintenance

Introduction

Many pilots have been performing maintenance. However, as some pilots have never received any formal advice or training concerning maintenance, some of this maintenance is legal, while some is not permitted.

The problem often is that pilots have never been informed about their privileges concerning maintenance.

The following discussion will attempt to dispel some myths and give pilots the knowledge needed to perform this very rewarding endeavour.

What maintenance is a pilot permitted to carry out?

A pilot who is endorsed on an aircraft type (is legally permitted to fly that type and holds a PPL or higher licence) is permitted to perform all the maintenance listed in Schedule 8 of the regulations (CAR 1988) for a class "B" aircraft only.

CASA has issued various instruments to allow pilots to perform other particular maintenance tasks for various operators or types of operations. The instruments contain the details, conditions and training that are required for the authorisation. Some examples are;

- CASA instrument number 149/11 'Authorisation—pilot of Class B aircraft with optional dual controls'
- CASA instrument number 67/13 'Authorisation—pilot maintenance on class B rotorcraft'

Note: These types of CASA authorisation instruments often have an expiry date, so be sure to certify in accordance with the correct instrument number.

Schedule 8 lists 22 tasks, and includes conditions affecting what maintenance a pilot is permitted to do and sign for.

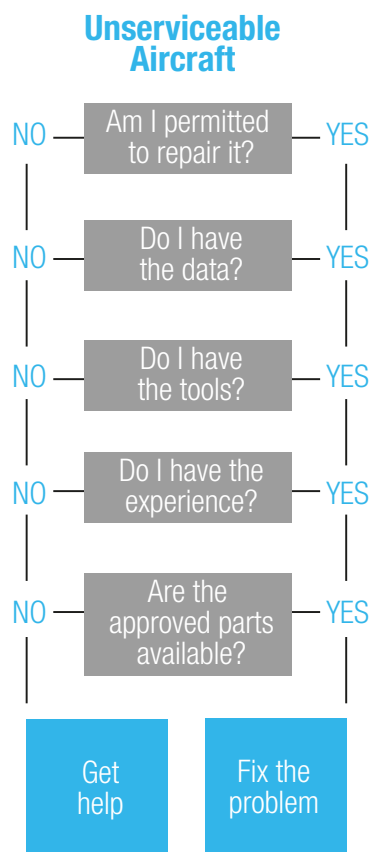
This list outlines the maintenance tasks that can be done by a person with minimum training and who has a few basic tools and access to approved maintenance data.

These restrictions are necessary because some maintenance tasks are complicated; have traps; require expensive specialist tools, test equipment, detailed maintenance procedures; or can have catastrophic effects if not performed correctly.

(A copy of schedule 8 can be found in annex A of this section.)

How to do it

Anyone performing maintenance should ask themselves a few questions before they even consider starting the job. These are represented in the flow chart below:



Data

The current approved maintenance data can be more difficult to acquire. In some cases, the flight manual will contain the information you need, but in others you will need to gather the information from the maintenance manual. You do not necessarily have to buy one, but it would be good to have access to a version that is approved and up to date. Sometimes the information you need will be in the equipment maintenance manual; for example, the spark plug torque will normally be found in the engine maintenance manual.

For particular tasks, make a copy of the appropriate pages and keep them with your tool kit and spares, updating them as necessary.

If you are performing the maintenance at a place where there is a maintenance organisation, perhaps ask for their help; or if you are in a remote location a phone call could save you money and time.

Some component manufacturers will also supply data to you on request. For example, the Champion spark plug data book will give you gap settings and the part number of the correct spark plug for your engine. Keep this data up to date too.

The Civil Aviation Regulations (CAR 42V) mandate that maintenance can only be performed by personnel with access to the approved data, so if you don't have the data you can't do the work.

Tools

Tools must be serviceable, appropriate and calibrated.

Appropriate tools need not be expensive, but they do need to be the correct size and be in good condition. A basic tool kit could consist of:

1. A set of good quality sockets and drives, including extensions from $\frac{3}{8}$ " AF to 1" AF. These can be either $\frac{1}{2}$ " drive or $\frac{3}{4}$ " drive, depending on your preference. For metric aircraft the sizes are 8mm to 25mm. You will still need some AF sockets such as a $\frac{7}{16}$ " for spark plugs. Sockets must be the correct size, good quality and robust; that way they are not easily damaged and retain their correct size. Socket sets can be extremely expensive, but there is no need to purchase expensive tools unless they are fit for purpose and you intend to use them every day. A good indication of quality is the inclusion of a more than 12-month guarantee in the purchase price. The ratchets must be firm and not prone to slippage, to avoid damage to knuckles.
2. A set of good quality open-ended or combination spanners in the same sizes as the sockets. Combination spanners are recommended, but will only be one size per spanner.



3. A set of screwdrivers, both flat and Phillips head from #1 to #2 in various lengths. Ensure the handles are big enough and the blade is firmly held in the handle. This permits maximum grip and prevents slippage. Never use screwdrivers as scrapers or strike them with a hammer. Check the tips before use and repair or discard if damaged. Ratchet screwdrivers or handles with removable tips are adequate, provided the tip is held tightly and cannot fall out. These have the advantage that the tips can be replaced easily and are relatively cheap.
4. A tension wrench, 0-50 foot-pounds, with a drive to match your sockets. This will need to be calibrated at regular intervals. See your maintenance providers to arrange for this. Ensure that these are good quality. The additional cost is worth it as poor-quality torque wrenches, while cheap, do not stay calibrated and are prone to damage. Never use a tension wrench as a spanner.
5. A spark plug kit consisting of:
 - A set of wire gauges
 - A plug-gapping tool
 - A plug-cleaning tool
 - A wire pick
 - Anti-seize compound
 - Plug socket, usually $\frac{7}{8}$ " deep without an internal lip
6. A valve core remover
7. A wheel nut spanner - size depending on aircraft type and model
8. Lock wire pliers. These are expensive but are worth it. There is no need to purchase a large pair.
9. A box to put them all in (plastic is lighter but not as strong).

Experience

Anyone performing maintenance should ask: Do I have the experience needed to do the job? Even though you will be using approved data, writers of these documents often assume that you have some experience in engineering. The only way to be sure you have the experience is to actually do the task, not just watch someone else do it.

Spare parts

All parts used in Australian aircraft must be approved for use in aircraft. In accordance with CAR 42W, this is normally done by the aircraft or component manufacturer and notified to users through the parts catalogue. The use of commercial parts without approval is not permitted. In some cases the manufacturer's part numbers may be on the part (e.g. wheel bearings), which means that the part can be purchased from a non-aircraft supplier. The problem is that information on quality may not be available to the person fitting the part because there could be several grades, for different uses. Using the wheel-bearing example, three or four different grades of bearing are sold commercially, all of which could have the same part number. Parts purchased from the aircraft manufacturer are quality controlled and are guaranteed by that manufacturer.

For some aircraft this could also apply to fluids, lubricants, greases and cleaning agents.

Reporting defects

The first step in reporting a defect found on the aircraft is to enter the details on Part 2 (endorsements) of the current maintenance release (MR). Regulation (CAR 1988) 248 says that at the termination of each flight, the pilot in command shall report all defects in the aircraft. Writing the defect in Part 2 of the MR when it is discovered is considered to meet this regulatory requirement of reporting all defects in the aircraft.

If the defect is major, the registered operator must investigate and forward a service difficulty report to CASA. Major defects are those which will make the aircraft unsafe.

Submit a service difficulty report online on the CASA website **www.casa.gov.au** (see the seven simple steps on page 40) or email **sdr@casa.gov.au**

The aircraft is then not airworthy and is grounded until the defect is rectified.

Refer to Regulations (CAR 1988) 51–53 for requirements about reporting defects and what is considered a major defect. Also CAAP 51-1 provides important guidance regarding the reporting of defects in aircraft.

Submit your SDR online in seven simple steps

Step 1

Go to the SDR section on the CASA website: www.casa.gov.au to get started.

Step 2

Select SDR type from the drop down box: the form will refresh with the applicable sections open for you to complete.

Required information is marked with an asterisk. Fill in any other pertinent information by opening the applicable section and entering details.

Tip for composing your description:

Create a temporary 'Word' document, enter your description and copy/paste to the SDR description box.

You can do this before selecting 'SDR and SUP Online Form' – it will reduce your time online, and will give you more time for research and writing your description.

Note: *The form description box has a maximum character limit of 4000 characters - approximately 56 lines. You can include additional information as an attachment.*

Step 3

'Occurrence' and 'causal factor' fields are not required data, but if you fill in one or more of these it will help in assessing your report.

Step 4

Selection of defect report type:

Initial notification of defect (additional information can be provided at a later date, i.e. 'follow-up' report), or

Follow-up notification (with additional investigation results)

Note: *If 'Follow-up' is selected, a tick box field will appear titled, 'Follow-up report from an earlier defect notification'. Click and enter the defect receipt number of your initial report.*

Step 5

Click 'Submit' You will be prompted if any of the required fields are not complete, i.e. the applicable field(s) will be coloured and/or a red text message will be displayed.

Step 6

You will be given a receipt number and the opportunity to attach photos, movies or other supporting documents.

Note:

Record your receipt number, date of occurrence and submitter's name for future reference.

You can make multiple attachments, but the size of each must not exceed 2Mb.

Step 7

Finish procedure or submit another defect. There are three options for continuing data entry:

- return to a cleared input screen,
- return to the input screen with your previously-entered data retained, or
- enter a receipt number, including the defect report's date of occurrence and submitters name, exactly as shown for that defect report's receipt number.

[illegible]

Certifying for maintenance

All maintenance performed must be signed off on the maintenance release or in the aircraft log book. Refer to Section 2 of this booklet for guidance on certification for maintenance.

Conclusion

A pilot who is permitted to fly an aircraft as pilot in command and holds an RPL (or higher) is allowed to carry out maintenance on an aircraft. This maintenance is restricted to that listed in CAR 1988 Schedule 8, for a B class aircraft (any aircraft that does not have a C of A in the transport category or is not used in regular public transport operations). For the rest, only maintenance approved by CASA is permitted.

When you are carrying out any maintenance task you must fulfill certain requirements:

1. Have the appropriate tools calibrated and in a good state of repair
2. Have the current approved data
3. Have the appropriate experience and training
4. Have the approved spare parts.

Remember: the maintenance included in Schedule 8 is designed to be carried out if you cannot get professional help from a maintenance engineer. Ask your maintenance organisation to show you how to do the tasks you are allowed to do and get to know your aircraft. If you are not sure about what you are doing, ask someone who does. When you do attempt maintenance, think safety first. Switch all power off and ensure the magnetos are off. After this, tag everything so that if someone is in the cockpit there will be no unpleasant surprises.

Lastly, when you do any maintenance task you must sign for it on the maintenance release and have it correctly certified before flight.

Following these simple procedures should enable you to carry out these tasks and give you peace of mind, so if you are stuck somewhere you may be able to fix the problem and have a safe flight to your next destination.

Aircraft with an approved system of maintenance should include in that system what maintenance you can do, and how to gain approval to do it.

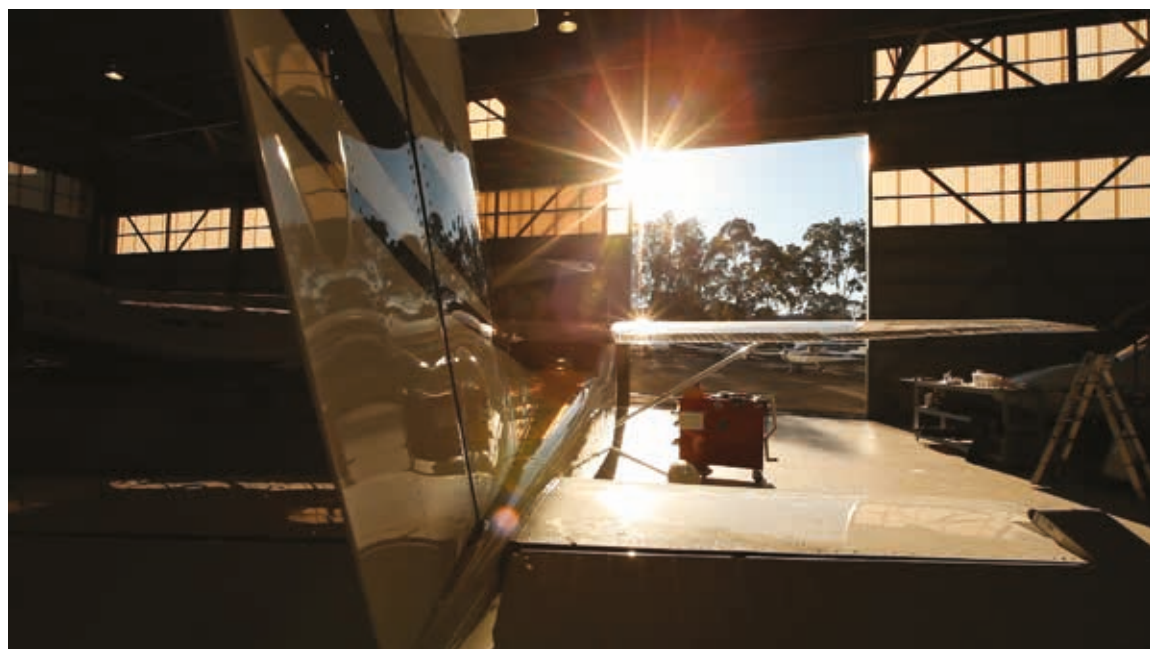
ANNEX A

CIVIL AVIATION REGULATIONS 1988

Schedule 8 maintenance that can be carried out on a B class aircraft by a pilot entitled to do so under sub regulation 42ZC (4)

1. Removal or installation of landing gear tyres, but only if the removal or installation does not involve complete jacking of the aircraft
2. Repair of pneumatic tubes of landing gear tyres
3. Servicing of landing gear wheel bearings
4. Replacement of defective safety wiring or split pins, but not including wiring or pins in control systems
5. Removal or refitting of a door, but only:
 - a) If no disassembly of the primary structure or operating system of the aircraft is involved
 - b) If the aircraft is to be operated with the door removed that the aircraft has a flight manual indicating that it can be operated with the door removed
6. Replacement of side windows in an unpressurised aircraft
7. Replacement of seats, but only if the replacement does not involve disassembly of any part of the primary structure of the aircraft
8. Repairs to the upholstery or decorative furnishings of the interior of the cabin or cockpit
9. Replacement of seat belts or harnesses
10. Replacement or repair of signs and markings
11. Replacement of bulbs, reflectors, glasses, lenses or lights
12. Replacement, cleaning, or setting gaps of spark plugs
13. Replacement of batteries
14. Changing oil filters or air filters
15. Changing or replenishing engine oil or fuel
16. Lubrication not requiring disassembly, or requiring only the removal of non-structural parts, or of cover plates, cowlings and fairings
17. Replenishment of hydraulic fluid
18. Application of preservative or protective materials, but only if no disassembly of the primary structure or operating system of the aircraft is involved
19. Removal or replacement of equipment used for agricultural purposes.
20. Removal or replacement of glider tow hooks
21. Carrying out an inspection under regulation 42G of a flight control system that has been assembled, adjusted, repaired, modified or replaced
22. Carrying out a daily inspection of an aircraft





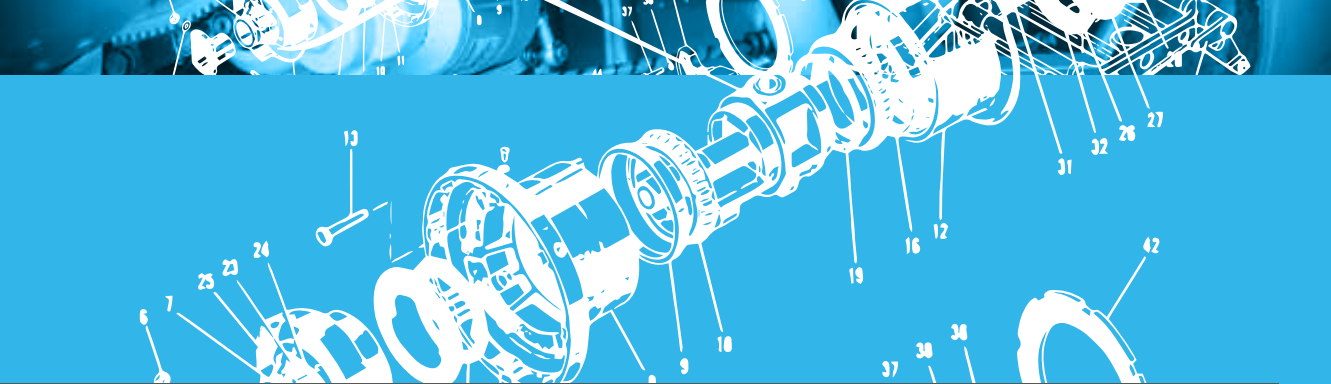
Personal minimums

Before the task

- ✓ Do I have the knowledge and qualifications to perform the task?
- ✓ Do I have the approved maintenance data to perform the task?
- ✓ Have I performed the task previously?
- ✓ Do I have the proper tools and equipment to perform the task?
- ✓ Have I had the proper training to support the task?
- ✓ Am I mentally prepared to perform the task?
- ✓ Am I physically prepared to perform the task?
- ✓ Have I taken the proper safety precautions to perform the task?
- ✓ Do I have the resources available to perform the task?
- ✓ Have I researched the CASA rules and regulations to ensure compliance?

After the task

- ✓ Did I perform the task to the best of my abilities?
- ✓ Was the task performed to be equal to, or better than, the original?
- ✓ Was the task performed in accordance with the approved maintenance data?
- ✓ Did I use all the methods, techniques and practices acceptable to the industry?
- ✓ Did I perform the task without pressure, stress and distractions?
- ✓ Did I reinspect my work or have someone inspect my work before return to service?
- ✓ Did I make the proper paperwork entries for the work performed?
- ✓ Did I perform the operational and leak checks after the work was completed?
- ✓ Is the work area clear of tools and service items?
- ✓ Am I willing to certify for the work performed?
- ✓ Am I willing to fly in the aircraft once it is returned to service?
- ✓ Have I complied with CASA rules and regulations?



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