

Aircraft Maintenance

General

Civil Aviation Authority (CAA) advisory circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an acceptable means of compliance with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC describes an acceptable means of compliance with the general maintenance rules set out in Civil Aviation Rule Parts 43 and 91, Subpart G.

Related Rules

This AC relates specifically to Civil Aviation Rule Part 43 - *General Maintenance Rules*.

Change Notice

This revision simplifies the requirements for maintenance records and the use of Acceptable Technical Data (ATD), particularly in sections 2.7 and 2.14. It also standardises the use of abbreviations and terminology. Revision 5 incorporated Part 43 amendments since May 2009. Incorrect references were subsequently discovered, at para 2.6, to Appendix G of the Federal Aviation Regulations (FARs), not Appendices A and H: these have been corrected in Revision 5.1.

Cancellation

This AC cancels AC AC43-1 Revision 5.1 4 dated 2 September 2021 18 May 2009.

Version History

History Log

Revision No.	Effective Date	Summary of Changes
0	14 July 1995	The initial issue of the AC.
1	19 January 1996	Re-numbered this AC from AC43-1 to AC43-

		1A. AC43-1 was revoked and replaced.
2	25 December 1997	Re-numbered this AC from AC43-1A to AC43-1B. AC43-1A was revoked and replaced.
3	27 April 2007	Re-numbered this AC from AC 43-1B to AC 43-1 Revision 3.
4	18 May 2009	Incorporated Part 43 amendment numbers 33, 34, 34A, 35 & 36, revoked and replaced AC43-1. AC43-1 Revision 3 was revoked and replaced.
5	20 May 2021	Incorporated Part 43 amendments up to 20 July 2018 (the most recent amendment). AC43-1 Revision 4 was revoked and replaced.
5.1	2 September 2021	Corrected references in para 2.6, referring in error to Appendix G of the Federal Aviation Regulations (FARs), not the correct Appendix A to FARs 23 and 27, and Appendix H to FAR 25 Appendices A and H.
6	Xx xxxx 2021	Simplifies the requirements for maintenance records and the use of ATD, particularly in sections 2.7 and 2.14. Standardises the use of abbreviations and terminology

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1. General

Part 43 prescribes the requirements for the maintenance and release to service after maintenance of aircraft, and components to be fitted to aircraft, that are required by Civil Aviation Rules (CAR) Part 91 to have an airworthiness certificate issued under Part 21.

Only rules requiring guidance and informative/explanatory material are included in this AC. Where the rule is considered to be self-explanatory, it will not appear in this AC.

Additional requirements for certificated maintenance organisations (MOs) are prescribed in Parts 119 and 145. Acceptable means of compliance for Parts 119 and 145 can be found in the AC119 series and AC145-1, *Aircraft Maintenance Organisations*.

2. Subpart B—Maintenance

2.1 43.51(a)(6) Under direct supervision

Direct supervision requires the active participation of both the supervisor and the person carrying out the maintenance. The supervisor must be appropriately licenced and rated, or hold an appropriate authorisation from a Part 145 MO Maintenance Organisation. The supervisor's expectations in terms of limitations, and how and when they want to be directly involved in the task should be conveyed, with all arrangements understood and agreed before starting any maintenance. Regardless of the way in which direct supervision is provided, the responsibility for the completed maintenance task rests solely with the supervisor.

Consequently, for direct supervision, a supervisor should:

- (a) have considered the competence (e.g. training, knowledge, experience) of those performing the tasks, and ensure the availability use of appropriate resources (refer rule, 43.53)
- (b) know when the maintenance is being undertaken
- (c) be immediately available, in person, for consultation with and to provide advice and direction to the persons carrying out the work
- (d) directly observe the work being done at important stages, to approve or disapprove of the work. These important stages should be planned prior to commencement to prevent possible re-work, uncovering etc, and
- (e) have an appropriate level of competence of the task being undertaken to enable them to effectively supervise the work being undertaken.

Persons performing the maintenance must:

- be aware of, and meet, the relevant performance requirements (in conjunction with the supervisor) (refer rule 43.53), and
- ensure that they are being directly supervised, including seeking the direct involvement of the supervisor at important stages.

The extent and nature of the supervision will ultimately depend on the maintenance being performed, and the competence of those performing the maintenance. In all cases it should be

made clear by the supervisor, to the person performing the work, at what stage and under what circumstances the supervisor is to be consulted. For the proper control of maintenance tasks, it is appropriate that the stages where a supervisor must be consulted, or the work reviewed, be detailed in the work records.

Direct supervision can only be achieved if the supervisor:

- is readily available, in person, for consultation, and
- observes the work being carried out to the extent necessary to ensure that it is being carried out properly.

2.2 43.51(b) Persons to perform maintenance

Under rule 43.51(b) allowance is made for a limited scope of unsupervised maintenance to be carried out by persons who would otherwise require direct supervision.

For aircraft not required to be maintained under the authority of a Part 145 certificated maintenance organisation (MO), the persons performing maintenance must be authorised in writing by the operator of the aircraft and they must be appropriately trained and assessed as competent to carry out the task by an appropriately licensed and rated engineer. This training and assessment will include the recording and certifying requirements of Part 43.

For aircraft that are required to be maintained under the authority of an MO, training and authorisation should be carried out in accordance with the procedures of the operator's designated MO. When conducting maintenance under the authority of an MO, authorisation holders must comply with the procedures contained within that MO's exposition.

In either case above, the scope of authorisation provided should not exceed the provisions detailed in Part 43 Appendix A.1, and/or A.2.

In completing the task, the applicable and appropriate Acceptable Technical Data (ATD) must be used each time the task is performed, to ensure that the task is completed in accordance with acceptable methods, techniques, and practices.

The person performing the work is to make an entry in the aircraft logbook or other acceptable maintenance record stating what work has been performed. The person must also certify a statement of release-to-service for the work carried out. It is the responsibility of the pilot-in-command to ensure that the aircraft is not operated unless the aircraft has an appropriate release-to-service for all work carried out.

2.3 43.53 Performance of maintenance

All maintenance, regardless of depth or complexity, should be completed to a standard acceptable to the Director. In the case of a Part 145 certificated MO maintenance organisation, procedures must be in place to ensure that appropriate standards are maintained. For maintenance providers who are not working under the authorisation of a Part 145 organisation, the responsibility to ensure acceptable maintenance standards are met rests with the certifying engineer.

2.4 43.53(1) Familiarity with the actions required

Anyone performing maintenance on an aircraft or component must be familiar with the relevant maintenance actions to ensure continued airworthiness. They must be familiar with the Instructions for Continued Airworthiness (ICA) which relate to the maintenance being performed, and they must have a level of knowledge of the aircraft or component relative to the scope and depth of maintenance being carried out.

Whereas Part 145 certificated maintenance providers must assess the familiarity of their authorisation holders to ensure competence, for non-certificated providers it is the responsibility of the certifying engineer to ensure that they are competent to maintain and certify an aircraft, product, or component as fit for release-to-service. Certifying engineers should be cautious of relying solely on an appropriate rating on an aircraft maintenance engineer licence as a definitive measure of competence. For example, if a licensed aircraft maintenance engineer has a rating for a helicopter type but has been working on fixed wing aircraft for the previous three years, that engineer should not consider themselves familiar with the tasks involved in maintaining that type of helicopter. To ~~develop~~ ~~assist in developing~~ familiarity, ~~it may be necessary for the engineer~~ ~~may need~~ to study the manuals, attend a refresher course, or discuss the maintenance with another engineer who is familiar with the maintenance task and type of helicopter.

Along with satisfying the requirements of familiarity, engineers must ensure that they satisfy the requirements of ~~rule~~ 66.57, Recent experience requirements, in that they cannot exercise the privileges of their licence unless they have done so for a combined period of at least 6 months within the immediately preceding 24 months.

Familiarity is not the same as recent experience. The methods described above for developing familiarity do not meet the recent experience requirements in ~~rule~~ 66.57.

2.5 43.53(2) Adequate housing and facilities

Persons performing maintenance must do so in an environment appropriate for the maintenance task being undertaken. In the case of non-certificated maintenance providers, the certifying engineer must make the assessment, and ultimately assume responsibility as to the suitability of the environment. They must ensure that adequate facilities and resources are/have been provided, to ensure that the quality and safety of the work being undertaken is not compromised.

The vast scope of possible maintenance activities makes a definitive list of requirements impractical, but at a minimum, maintenance providers must ensure that the maintenance environment complies with any conditions prescribed in the applicable ~~ICA instructions for continued airworthiness and~~ ~~ATD acceptable technical data~~.

In assessing the suitability of a facility, location or environment in which the maintenance activity is conducted, consideration should be given to the effect on human performance. Prior to commencing maintenance, consideration should be given to error-inducing conditions such as poor lighting, and the extremes of heat or cold and the impact they may have on outcomes.

The requirements for adequate housing and facilities apply equally to certificated and non-certificated maintenance providers, with the exception that in the case of a certificated ~~MO maintenance organisation~~, the certificate holder rather than the certifying engineer, has a responsibility to ensure the facilities and resources are appropriate.

If the scope of aircraft maintenance to be carried out is limited to line maintenance, or defect rectification, hangar accommodation may not be necessary. However, it is not considered acceptable for a provider of heavy/base maintenance, regardless of aircraft size, to lack access to appropriate hangar facilities.

Suitable accommodation must be provided for the storage of publications, records, spares and equipment. Where aircraft components, parts, or materials are held, they should be stored and handled in accordance with the procedures of AC00-2 *Storage and Distribution of Aeronautical Supplies*.

2.6 43.53(3)(i) Methods techniques and practices

Acceptable methods, techniques, and practices are in most cases specified in the ICA instructions for continued airworthiness published by the aircraft or equipment manufacturer.

NOTE: Where there is a conflict between the manufacturer's information and the methods, techniques, and practices detailed in the New Zealand Civil Aviation Rules, the rules are considered the minimum requirements and therefore take precedence.

Under United States Federal Aviation Regulations (FARs) Parts 23, 25, and 27, aircraft designers and manufacturers are required to provide ICAs instructions for continued airworthiness. Appendix A to FARs 23 and 27, and Appendix H to FAR 25 define the content of the instructions for continued airworthiness. Design standards of other foreign aviation authorities contain similar provisions. Superseded ICAs instructions for continued airworthiness cannot be used.

2.7 43.53(3)(ii) Equivalent methods, techniques and practices

Equivalent methods, techniques, and practices used in the maintenance of aircraft or components must be acceptable to the Director. Data which is acceptable to the Director is listed in Part 21 Appendix D, Acceptable Technical Data.

It is often necessary for an engineer to use multiple sources of ATD to complete a repair or modification. In these instances, the engineer must ensure that all documents referenced are listed in Part 21 App D, they do not contradict one another (or the manufacturer's ICA) and that the limitations contained within each reference are complied with.

~~If doubt exists as to the acceptability of any documented maintenance practice, a request should be made to the Director to confirm that it is acceptable.~~

The completed record of maintenance should make it clear which items of ATD have been referenced. If it is intended to use equipment, documentation, or work practices which are not specified in the relevant ICA or ATD, ~~do not meet the original criteria of acceptability~~, such changes are to be submitted to the Director or a Part 146 Design Organisation for acceptance/approval. The Director/Design Organisation may accept/approve changes if satisfied that the alternative methods, techniques or practices provide an equivalent level of safety. ~~If there is any doubt as to the acceptability of any documented maintenance practice, a request should be made to the Director to confirm that the practice is acceptable prior to its use.~~ Maintenance providers must ensure that they are familiar with the data they use, and that it is directly applicable to the maintenance being undertaken.

FAA AC43.13-1B

A commonly used source of ATD is (the US Federal Aviation Authority's) FAA AC43.13-1B. It "contains methods, techniques and practices acceptable to the (FAA) Administrator for the inspection and repair of non-pressurised areas of civil aircraft, only when there are no manufacturer repair or maintenance instructions".

The use of FAA AC43.13-1B is subject to a number of conditions for use, both in the Rules (Part 21 Appendix D (b)), and in the document itself. It is the certifying engineer's responsibility to ensure that all conditions for use are satisfied whenever they use FAA AC43.13-1B.

AC43-9, Modifications, Repairs, and the CAA 337, contains details regarding the process whereby information from FAA AC43.13-1B may be approved for use as ATD for a major modification or repair.

~~CAR Part 21 Appendix D details data which has been found acceptable to the director. Maintenance providers utilising this data must ensure that they are familiar with the data, and that it is directly applicable to the maintenance being undertaken.~~

2.8 43.53(4) Materials, parts, and appliances

~~CAR Part 21 Subpart K and AC00-1, *Acceptability of Parts*, provides information to assist a maintenance provider in assessing the acceptability of materials, parts and appliances, for use during the maintenance of an aircraft, product or components.~~

Regardless of the presence of an authorised release certificate, the responsibility to ensure acceptability of parts rests with the installer. Installers must ensure that the statement in block 12 of the authorised release document covers all necessary maintenance actions to ensure airworthiness of the component before installation.

It should also be noted that an authorised release certificate which attests to the conformity of the article does not imply installation eligibility. A statement of conformity must specifically identify the **ATD** ~~acceptable technical data~~ against which conformity is certified.

2.9 43.53(5)-(7) Tools, test equipment and special test equipment

Maintenance providers assessing equivalency for test equipment (refer **rule** 43.53(6)) must ensure that the tolerances, repeatability, and accuracy of equivalent test equipment meets the same standards as the original equipment specified in the relevant **ICA** ~~instructions for continued airworthiness~~. They must ensure that the substantiation fully demonstrates equivalency of the test equipment, and that a record of the assessment and the applicable data used to make the assessment is retained.

For determining equivalency, an assessment must be made between the technical specifications of tooling, equipment or test equipment recommended by the manufacturer and the proposed equivalent. If the technical specifications of the manufacturer recommended tool are not available, the assessor who determines equivalency will have to document the basis under which they have made the assessment. A simple assessment of fit, form, and function completed by the user may be sufficient for a non-complex tool used in a non-safety critical task, whereas the assessment of a complex tool, or one used in a safety critical application may require design organisation input. Regardless of the complexity of the tool, or the nature of the application, if the use of equivalent tooling potentially affects compliance with the relevant ICA, the maintenance provider must source ~~acceptable~~/approved technical data from a design organisation prior to use.

Where the tooling, equipment or test equipment is locally made from data provided by the component or aircraft manufacturer then equivalency will not be necessary. However, a recorded conformity assessment, stating the manufacturing data used, should be carried out.

If tooling, equipment or test equipment is required to be calibrated, a calibration system must be established with documented procedures demonstrating traceability to the appropriate national or international standard.

2.10 43.53(8) Perform the maintenance

Applicable airworthiness requirements manuals and publications (**ICAs**) ~~instructions for continued airworthiness~~ relevant to the range of aircraft to be maintained are to be made

available and referred to whilst conducting the maintenance. The user must ensure that the data referenced is at the latest amendment/revision.

2.11 43.53(9) Completion of maintenance

A person certifying release to service on completion of maintenance, is to ensure that with regards to the work carried out, the aircraft, product or component is satisfactory for release-to-service, and at least equal to its original or properly modified condition. Whilst the statement of release to service applies to the work which has been carried out and identified in the relevant documentation, there remains a responsibility on the certifying engineer that they do not release a product or component which they know to be unairworthy.

To ensure the aircraft condition can be easily determined, persons carrying out the inspection should use worksheets or check lists to provide assurance of compliance with an approved schedule. These worksheets or checklists are to provide a means of indicating that each inspection item has been completed. In some cases, worksheets are provided by aircraft manufacturers based on the maintenance schedule contained in the relevant ICAs.

Duty time limits apply to any person involved in maintenance activities on aircraft, products or components, and include any person performing, supervising, and/or certifying.

2.12 43.55 Recording of overhaul

The definition of overhaul is contained in CAR Part 1. **A Part 145 Certificated MO who certifies** ~~An MO wishing to certify~~ that a product or component has been overhauled must ensure that they have completed all required maintenance and testing in accordance with the relevant ICA of the manufacturer **or other ATD**. If **ATD acceptable technical data** is not available from the manufacturer, the **MO maintenance organisation should identify this during their capability assessment, and** seek the support of a design organisation in developing **ATD acceptable technical data**.

2.13 43.67 Non-destructive testing

Refer AC43.8 *Non-destructive testing*

2.14 43.69 Maintenance records

On the completion of maintenance, sufficient detail must be entered into the logbook to ensure that any maintenance personnel reviewing the logs without reference to the detailed work records will be able to understand what work has been done to the aircraft. **This rule Part defines the minimum details the minimum requirements for maintenance records which are to be entered in the maintenance records.** ~~to be entered in the applicable maintenance logbook and /or technical log, or maintenance record sheet attached to the technical log.~~

All maintenance is to be recorded in the applicable logbook or other record acceptable to the Director. Entries must be permanent and should be made carefully and completely. Errors should be corrected in a manner that allows the original entry to be read, but clearly identifies that the entry was in error. A single line struck through the entry with the statement 'entered in error' and signed by the person making the correction is recommended. Where maintenance is recorded in the aircraft technical log, and the maintenance logbook is not available, a separate record of the maintenance should be sent, independently of the aircraft, to the operator for them to update the maintenance logbook.

Maintenance logbooks include instructions for use on the inside front cover, and entries must comply with these instructions for use. ~~The responsibility for maintaining maintenance logbooks rests with the aircraft operator.~~ **Maintenance logbooks and the records they contain**

form the official history of the aircraft: they are exceptionally valuable and should be treated accordingly.

The operator owns and is responsible for maintaining the logbooks and all maintenance-related documentation. Maintenance providers must return the maintenance logbooks and maintenance documents to the operator when requested to do so. Maintenance providers should ensure that operators have the original versions of all work records prior to disposing of records they hold. Maintainers who agree to retain records, including logbooks on behalf of operators, should ensure that they are protected from fire, water and other types of damage. Both parties should consider using a written agreement, detailing the responsibilities and liabilities of each party.

The completed records should represent an accurate summary of the maintenance carried out including the details of the relevant ICA or ATD referenced in completing the maintenance. If an equivalent method, technique or practice (rule 43.53(3)(ii) has been used in the maintenance, this should be detailed in the work record along with the details of the underpinning data. Relevant dates, and details of the engineers (including those directly supervised) involved with each task should be recorded.

It is extremely important that the certifying engineer ensures that an accurate summary of all maintenance carried out is made in the relevant work record. They hold ultimate responsibility for the work carried out, and an accurate work record will be extremely valuable to them, should the aircraft's airworthiness be called into question following the maintenance. Records which show a lack of detail/un-recorded maintenance, fail to record the referenced ICA or ATD, or which detail maintenance actions for which no supporting data exists, can place the certifying engineer and the operator in an extremely compromised position during any future review.

2.15 43.69(a)(5) Airworthiness Directive (AD) actioned as a part of maintenance

When an AD is actioned under maintenance, maintenance providers should provide enough detail of the AD, including revision status, and the method of compliance in the maintenance records etc. to enable the operator to update their records and manage on-going AD compliance.

If AD compliance has been achieved via an **Alternate** ~~Acceptable~~ Means of Compliance (AMOC), this should be referenced in the maintenance records. Maintenance providers must ensure that they have access to the AMOC prior to certifying compliance. **CAA must approve each AMOC before it may be applied, including cases where an AMOC has been issued by the state of design.**

~~If in the event~~ an AD has more than one or a staged compliance, it is important that each compliance requirement is recorded and certified by the maintenance provider separately until such time as the compliance action terminates the AD.

2.16 43.69(b) Associated worksheet

Worksheets provide the operator and maintenance provider with a valuable ~~historic~~ record of maintenance undertaken. They should be compiled in a way that is easily understandable for anyone not associated with the maintenance task.

Worksheets should be kept up to date during maintenance so that they accurately reflect the aircraft status. Various accidents have been attributed to incomplete maintenance where maintenance providers have initiated a maintenance action without making a record in an appropriate document. Accurate work records assist the certifying engineer in ensuring that all

necessary maintenance, including work arising during the check, is complete and that the aircraft is in an airworthy condition prior to release to service. They also support the operator in making an assessment that all necessary maintenance has been completed prior to returning the aircraft to operation.

Worksheets may include checklists detailing items from the aircraft maintenance schedule and a means for persons doing the work to indicate the item has been completed. The checklist and, if used, the co-ordination document, should have the printed name, sample initials and signature of everyone who carried out the maintenance. ~~The completed records should represent an accurate summary of the maintenance carried out, with the relevant dates, and details of the engineers involved with each task included.~~

NOTE: *The use of checklists does not remove the requirement to reference the technical data to perform the required work. Refer **rule** 43.69(d).*

Worksheets form part of the maintenance records of the aircraft, product or component and are critical to the operator's ability to manage their continuing airworthiness. Completed worksheets should be passed to the aircraft operator on completion of the maintenance for their retention **as an aircraft record**. ~~Maintenance providers who agree to retain records, including logbooks on behalf of operators should ensure that they are protected from fire, water and other types of damage. Operators and maintenance providers should consider using a written agreement, detailing the responsibilities and liabilities of each party.~~

All worksheets and associated documentation should be complete prior to the certifying engineer issuing the release to service.

2.17 43.69(c) Maintenance to rectify a defect:

Where defect rectification or inspections are raised on the aircraft technical log, the person performing maintenance must, on completion certify in the aircraft technical log. The certifier must also record the relevant details of maintenance carried out in the maintenance logbook.

Where the maintenance logbooks are not available, details of the work carried out are to be forwarded to the holder of the maintenance logbooks. Maintenance providers and operators should ensure that maintenance records are not carried on the aircraft to which they relate.

NOTE: *The CAA400 'Maintenance Record Sheet' also provides a duplicate that can be inserted into the maintenance logbooks to satisfy the requirements of rule 43.69(c)(2) & (3). Refer AC91-6 Aircraft Technical Log.*

~~2.18~~ **43.69(d) Maintenance record**

~~Entries in maintenance records should be made carefully and completely, they form the official history of the aircraft and will be critical in any subsequent fault finding, reporting, or other analysis. All maintenance is to be recorded in the applicable logbook or other record acceptable to the Director.~~

~~Where worksheets are utilised, the maintenance logbooks must contain a summary of the maintenance performed and a reference to the worksheets. The worksheets then become part of the aircraft records.~~

~~The operator owns the maintenance logbooks and all maintenance related documentation. Maintenance providers must return the maintenance logbooks and maintenance documents to the operator when requested to do so. Maintenance providers should ensure that the operator has the original versions of all work records prior to disposing of any records they hold.~~

~~If a maintenance provider elects to use a computer system to record the maintenance carried out, a copy of the record must be entered in the maintenance logbook in a form acceptable to the operator.~~

3. Subpart C—Release to Service

The Director may authorise persons who do not otherwise meet the requirements to certify release-to-service following maintenance. This authorisation takes the form of a Part 66 Certificate of Maintenance Approval (MA), detailing the privileges conferred and any limitations. An MA is issued for a limited scope of maintenance activities, for a limited period. It is not intended as a permanent replacement for an aircraft maintenance engineer licence. Limited tasks for which an MA may be issued include:

- (1) special process, or processes not covered in the present aircraft maintenance engineer licence area, such as explosives or egress systems
- (2) maintenance on new aircraft types where no aircraft maintenance engineer licence holder can satisfy the experience criteria for type rating issue
- (3) maintenance on amateur built aircraft, and/or
- (4) maintenance not covered in Part 43 Appendix A such as removal or installation of dual controls.

A person holding an appropriate licence issued by an ICAO Contracting State, acceptable to the Director, may issue a release-to-service on a New Zealand registered aircraft for maintenance performed outside New Zealand. This provision is intended primarily for those occasions where New Zealand aircraft are transiting other countries. Regardless of the licence issuing state, all maintenance performed must comply with New Zealand **Rules CARs**.

3.1 43.105 Certifying release-to-service after maintenance

The release to service statement is to be made in the maintenance logbook or other form of acceptable maintenance document, following or alongside the record of maintenance carried out. Because the statement is quoted in the rule, it must be used word for word with no modification. Care should be taken when using older logbooks or documents that the pre-printed statement of release to service complies with current rule requirements.

Release-to-service statements are to be accompanied by the name, signature, and licence, approval or authorisation number of the person releasing the aircraft, product or component to service, and date of the entry.

For components not installed or allocated to an aircraft, the release to service must be certified on either 7 CAA Form One or CAA Form Two.

3.2 43.107 Inoperative equipment

Equipment left inoperative in an otherwise serviceable aircraft must be identified in the technical log or equivalent, along with any necessary operational limitations. Flight crew must be provided with suitable visual identification adjacent to the indication or activation medium of such equipment, stating that the instrument or equipment is inoperative.

A detailed description of the inoperative equipment, the reason for its non-serviceability, and future date to reassess the maintenance required is to be included in the maintenance

records. A release-to-service statement is to be made in maintenance records indicating the aircraft is fit for release-to-service. Refer **rule** 91.603(a)(5).

If equipment is inoperative during an inspection, maintenance review or a review of airworthiness, it is to be reassessed. It is not necessary to rectify the inoperative equipment, but an entry should be made in appropriate records that the equipment has been reassessed and remains inoperative.

The person certifying the release to service with inoperative equipment must record the **ATD acceptable technical data** which underpins the certification in the technical log or maintenance logbook.

NOTE: For aircraft operated by a Part 115, 119 or 137 Certificated Organisation, except as may be provided by a minimum equipment list approved under **rule** 91.539, all instruments and equipment installed in the aircraft must be in an operable condition.

3.3 43.113 Duplicate safety inspection of control system

A duplicate safety inspection is an important inspection task to capture errors in the maintenance of safety critical systems, which is performed after assembly, disturbance, or adjustment of any part of a control system. Duplicate safety inspections are to apply to all parts of control systems subject to assembly, disturbance, or adjustment and are applicable to both installed components and components undergoing maintenance separately.

The rule requires a duplicate safety inspection be performed on control systems, but there may be other safety critical systems (e.g. rotorcraft drive systems) where a duplicate safety inspection is considered appropriate by an operator and/or maintenance provider. Certificated operators and MOs must have procedures for conducting duplicate inspections which should include the maintenance actions that require duplicate inspections.

The certifying engineer may not issue a release-to-service for maintenance that includes the initial assembly, adjustment or disturbance of a control system, unless a duplicate safety inspection has been completed and certified in maintenance logbooks, technical logs or worksheets.

The first part of the duplicate inspection would normally be carried out by the person who is certifying a release-to-service for the work requiring inspection.

The second part of the duplicate inspection is to be carried out and certified by a person that the first certifying person considers to have adequate training, knowledge, experience, and who holds an appropriate document. The person performing the second inspection must be made aware of the requirements and be familiar with the tasks and technical data involved.

The duplicate safety inspection is not simply a process of confirming the work has been carried out, but a detailed review of the maintenance actions to capture any errors that may have occurred.

A control system is defined in **CAR Part 1**, and includes all associated units, whether mechanical, electrical, electronic, hydraulic, or pneumatic.

For fixed wing aircraft, the systems include the attachments of, and means of actuating:

- (a) primary control surfaces
- (b) tabs

- (c) air brakes
- (d) flaps, and
- (e) other control systems that affect the attitude of the aircraft in the air.

For rotorcraft, the systems include:

- (a) the attachments of all rotor blades, including anti-torque fans and assemblies, and
- (b) Flight Control Systems including all collective pitch, cyclic pitch, and yaw control.

For engines and propellers, the systems include all associated units – mechanical, hydraulic, electrical, electronic or pneumatic that control:

- (a) power output and control, and
- (b) emergency operation.

For all aircraft, the systems include electronic and /or computer-controlled engine management and/or flight control systems including all components that interface with such systems. Electrical wiring and connectors associated with control systems which are disturbed during maintenance, are subject to duplicate inspection to confirm correct assembly, locking and function.

To complete a duplicate safety inspection, both persons need to be familiar with the control system and have available the relevant technical data e.g. the manufacturer's maintenance manual or ICA instructions for continued airworthiness that detail maintenance requirements specific to the system.

Each of the persons performing a duplicate inspection must verify that:

- (a) the maintenance record specifically identifies the control system, and details which specific sections of the control system have been disturbed
- (b) all parts of the system which have been disturbed, are assembled and function correctly, the inspection should include checks to ensure:
 - (1) correct rigging
 - (2) correct locking, and
 - (3) no possibility of fouling or jamming
e.g. ensuring control cables are correctly routed and any work aid cable locking mechanisms removed, and
- (c) for the complete system, the controls function throughout the required range of travel in each mode, and with each alternative means of actuation:
 - (1) freely and in the correct sense
 - (2) without excessive backlash, and
 - (3) with the correct static friction.

During installation of control systems, all system components that will be inaccessible for inspection after complete assembly must have a duplicate safety inspection performed before concealment.

Where maintenance scheduling makes it impossible to complete a duplicate inspection in a single event, maintenance providers may consider separating the duplicate inspection into the two functional elements for completion, i.e. correct assembly and locking, separated from correct functioning. Accurate records must be made and certified at each phase of the inspection process and both parts of the certification recorded prior to a release to service. As with all maintenance records, it should be clear to someone not associated with the task which inspections have been completed, and which have not.

For further reading on errors, including avoiding and capturing errors, refer to: UK CAA CAP 716 *Aviation Maintenance Human Factors*, Cap 718 *Human Factors in Aircraft Maintenance and Inspection.*, and *CASA Human Factors Resource Guide for Engineers, Chapter 2, Error Management*.

3.4 43.115 Engine performance checks

A person should have completed appropriate training on the aircraft-engine combination before carrying out any engine ground running. The training should address the safety issues involved with engine ground running, and provide the person completing the ground run an appropriate level of familiarity to ensure that accurate, repeatable performance figures are obtained. An assessment of competence should follow the training to ensure understanding.

Engine performance checks should be carried out in accordance with the relevant ICA instructions for continued airworthiness. A completed set of results of required performance checks, including the ambient conditions of temperature and atmospheric pressure is then recorded in the maintenance logbook or worksheet.

Non-flight crew members who intend taxiing aircraft on movement areas of aerodromes must be authorised by the aircraft operator, or by an MO maintenance organisation - ref rule 91.119.

NOTE: Where a manufacturer has performance charts for an engine to determine the required test results for given engine/propeller configurations and atmospheric conditions, these must be referenced in the work records.

4. Subpart D—Review of Airworthiness (RA)

4.1 General

For standard or restricted category certificates of airworthiness, the RA comprises an assessment and inspection, of the aircraft's conformity to its type certificated or properly modified state, its maintenance records and its condition.

A maintenance logbook review confirms that since the previous review of airworthiness, all necessary maintenance, including design changes and applicable airworthiness directives have been completed and correctly recorded in accordance with the requirements of Part 43, and that the aircraft's current maintenance status complies with its maintenance programme. This includes the airworthiness limitations section of the manufacturer's ICA instructions for continued airworthiness and any embodied modification/STC holder's ICA instructions for continued airworthiness.

The RA is to be carried out within the preceding 12 months, or for aircraft not operated for hire or reward within the preceding 24 months.

In the case of an aircraft with a special category airworthiness certificate, the requirements to check conformity to a type certificate and reference to **ATD acceptable technical data** for embodied modifications and repairs, is not applicable.

4.2 43.155 Certifying review

The RA statement contained in 43.155(a) and repeated below is to be entered in the aircraft maintenance logbook and date of the next review entered in the appropriate section of the technical log by the holder of an inspection authorisation.

The statement to be used is: “I certify that an (annual)*(biennial)*¹ review of airworthiness has been carried out on this aircraft and that the requirements of Civil Aviation Rule 43.153(a) have been complied with”.

The person performing the RA has a 30-day period from the commencement of the RA to have the review completed and certified. If the review is not completed within this allowable time, it must be repeated to satisfy the rule requirement.

5. Subpart E—Certifying Conformity following Major Modification or Major Repair

NOTE: Refer AC43-9 which provides further information on major modifications and major repairs.

A major modification or repair is one which has the potential to affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- (a) structural collapse
- (b) loss of control
- (c) failure of motive power
- (d) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft
- (e) incapacitating injury to any occupant, or
- (f) unacceptable unserviceability or maintainability.

It is the responsibility of persons releasing the aircraft, product or component to service on completion of the modification or repair task, to assess the modification or repair for its potential consequences if incorrectly installed. This assessment will determine whether the modification or repair is major or not, and accordingly, any need to liaise with and involve a suitably experienced holder of an inspection authorisation before commencement of the modification or repair.

¹ Delete as applicable

5.1 43.203 Persons to certify conformity

Certification of a major modification or major repair requires the assessment of the maintenance against **ATD acceptable technical data**. Persons, who can certify conformity to **ATD acceptable technical data** or data approved by the Director, are:

- (a) holders of inspection authorisations issued under Part 66
- (b) Part 145 authorisation holders who have had equivalent training
- (c) persons authorised by the manufacturer of the aircraft, product or component, or
- (d) for gliders or glider components, glider engineers with Part 66 Subpart E equivalent training and examination requirements.

5.2 43.205 Certifying requirements

NOTE: A modification or repair must be compatible with all previous modifications or repairs to assure continued compliance with airworthiness requirements. All operating limitations and flight manual supplements are to be included in the flight manual.

The technical data under which the modification or repair is carried out is to be listed on form CAA 337, or equivalent document for certificated **MOs maintenance organisation**, and must be assessed for applicability initially by the maintenance provider and confirmed by the person certifying conformity.

The assessment for conformity entails a physical check of the modification or repair and the associated documentation requirements, to ensure the work has been carried out in accordance with the relevant technical data, and that the modification or repair is compatible with previous modifications and/or repairs.

The nature of the work being carried out will dictate what level of involvement the person certifying conformity has in the process of carrying out the maintenance. For example, where work will not be visible at the final inspection, the conformity inspection may be best completed in stages.

NOTE: Refer to AC43-9 Modifications, Repairs, and **the Form CAA 337**. This AC includes details on the use of **Form CAA 337**.

5.3 43.207 Certification

Certification of conformity of a major modification or major repair may be recorded on **Form CAA 337**, or equivalent document for certificated **MOs maintenance organisation**. The original of the completed form is to be provided to the operator of the aircraft for retention in the maintenance records and a copy of the form is to be sent to CAA within 7 days for retention on the aircraft file.

The person certifying RTS for the aircraft or component is responsible for making the proper entry in the aircraft maintenance records including reference to **the form CAA 337 that was submitted**.

Form CAA 337 is intended for use by the majority of industry. However, certificated **MOs maintenance organisation** may have alternate procedures and documents detailed in their expositions that fulfil the same function. Reference is to be made on these alternative forms to indicate their function as being equivalent to **Form CAA 337**.

6. Subpart F—Maintenance for Special Category Aircraft

6.1 43.301 Purpose

This subpart prescribes the rules that are additional to or exceptions from the requirements of Subparts B and C for the maintenance of an aircraft that has a special category airworthiness certificate issued under Part 21 Subpart H.

6.2 43.303 Performance of maintenance

Additional to the performance of maintenance requirements of rule 43.53, a person performing maintenance in accordance with an approved maintenance programme required by rule 91.605, on an aircraft with a special category airworthiness certificate, is to inspect the aircraft at the start of the maintenance programme for any likely defects or configuration anomalies unlikely to be detected in future routine inspections. This inspection may require the removal of panels or structure not normally required during routine inspections.

After this initial inspection, routine and detailed inspections are to be carried out in accordance with the maintenance programme.

6.3 43.305 Recording of overhaul

For aircraft with a special category airworthiness certificate, a person may state that an airframe, engine, propeller or component has been overhauled if it has been disassembled, cleaned, repaired as necessary, reassembled and tested using methods and techniques documented by the aircraft or component manufacturer or a military authority to standards acceptable to the Director. However, for aircraft with a special category – exhibition or limited airworthiness certificate, these requirements are to be specified in the maintenance programme required under rule 91.605.

7. Appendices A to F

The appendices include inspection requirements to be met when completing tests and inspections required by CAR Parts 43, Part 91, and any other rule. Specifically:

- (a) Appendix A1 and A2 – Maintenance
(refer rule 43.51(b))
- (b) Appendix B – Aircraft radio station tests and inspections
(refer rule 43.59 and 91.605)
- (c) Appendix D – Altimeter system tests and inspections
(refer rules 43.61 and 91.605)
- (d) Appendix E – SSR transponder tests and inspections
(refer rules 43.63 and 91.605)
- (e) Appendix F – Emergency locator transmitter (ELT) tests and inspections
(refer rules 43.65 and 91.605)