



AIRWORTHINESS

ADVISORY

CIRCULAR

CIVIL AVIATION AUTHORITY OF BOTSWANA

CAAB Document AAC-003

ENSURING AUTHENTICITY AND SERVICEABILITY OF AIRCRAFT PARTS

Intentionally left blank

TABLE OF CONTENTS

	Page number
1. Purpose	5
2. Status of this advisory circular	5
3. Applicability	5
4. Related Regulations	5
5. Related Publications	5
6. Definitions & Acronyms	5
7. Background	6
8. Approved Parts	6
9. Unapproved Parts	6
10. Supporting Documentation	7
11. Precautions to Prevent Inadvertent Acceptance of Unapproved Parts	7
12. Detection Procedures	8
12.1 General	8
12.2 Procurement Process	8
12.3 Acceptance Procedures	9
12.4 Supplier Evaluations	10
12.5 Summary Guidance	10
13. Unapproved Parts Reporting	11
14. Reporting Guidelines	11
14.1 General	11
14.2 Reporting to CAAB	11
14.3 Reporting to Type Certificate Holder	12
15. CAAB Handling of Reported Information	12
16. Notification of SUPs to Industry	12
17. Parts Stockists and Distributors	13
18. Parts Removed From an Aircraft No Longer in Service	13
19. Parts Recovered from an Aircraft Involved in Accidents	14
20. Disposal of Scrapped Parts	14
APPENDIX A – Suspected Unapproved Parts Report	17

Intentionally left blank

1. PURPOSE

This Airworthiness Advisory Circular (AAC) provides guidance for detecting suspected unapproved aircraft parts and reporting them to the appropriate authorities, proper usage of parts removed from aircraft no longer in service, and the disposal of scrapped parts.

2. STATUS OF THIS ADVISORY CIRCULAR

This Airworthiness Advisory Circular is an original issuance.

3. APPLICABILITY

This guidance is applicable to any member of the aviation industry, including aircraft maintenance personnel and organizations, manufacturers and distributors of aeronautical products.

4. RELATED REGULATIONS

- Civil Aviation (Airworthiness) Regulations – Part IV

5. RELATED PUBLICATIONS

Copies may be obtained from the Government Printer.

For further information on this subject, operators are advised to review the following ICAO publications -

- Annex 6, Part 1, 8.2
- Annex 6, Part 3, Section II, 6.2
- Annex 8, Airworthiness of Aircraft, Chapter 4:4.5 Authenticity and Serviceability of Aircraft Parts.
- Doc 9760, Airworthiness Manual, Part III

Copies may be obtained from Document Sales Unit, ICAO, 999 University Street, Montreal, Quebec, Canada H3C 5H7.

6. DEFINITIONS AND ACRONYMS

6.1 The following definitions are used in this advisory circular:

Approved Part. A part that meets approved design data applicable to that part and which has been manufactured and subsequently maintained in accordance with the requirements of the State of Design, Manufacture or Registry, as applicable.

Unapproved Part .A part that does not meet the requirements of an “approved part”. This term also includes parts which have been improperly returned to service (contrary to the applicable regulations).

6.2 The following acronyms are used in this circular

AAC Airworthiness Advisory Circular

AC Advisory Circular

BCARs Botswana Civil Aviation Regulations

CAAB Civil Aviation Authority of Botswana

Advisory Circulars (ACs) are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material. Where a regulation contains the words “prescribed by the Authority,” the AC may be considered to prescribe a viable method of compliance, but status of that “prescription” is always “guidance” (never regulation).

FSD	Flight Safety Directorate
ICAO	International Civil Aviation Organization
SDR	Service Difficulty Reporting
STC	Supplemental Type Certificate
SUP	Suspected Unapproved Part
TC	Type Certificate
TSO	Technical Standard Order

7. BACKGROUND

- 7.1 The need to ensure that parts installed on an aircraft meet the design specification and are serviceable is self-evident. The installation of any part failing to meet the intended design requirements degrades those requirements, leading to a degradation of airworthiness.
- 7.2 It is essential that for the purposes of continuing airworthiness a system of control exists which ensures that only parts meeting the approved design data applicable to a particular aircraft are installed on that aircraft. This circular provides guidance on the establishment of such a system

8. APPROVED PARTS

- 8.1 An approved part is one whose design has been found to be acceptable to the State of Design, whose proper manufacture has been approved by the State of Registry, and that has been found to be in a condition for safe operation by the State of Registry.

Note - Parts approved pursuant to 2.1 above are eligible for installation on a specific aircraft if, and only if, they also meet the approved design data applicable to the particular aircraft they are to be installed on. For example, a seat designed and approved for 9 g forward loads is not eligible for installation on an aircraft that is required to have a seat that is dynamically tested for 16 g.

- 8.2 Standard parts such as fasteners are considered approved parts when they are in compliance with a national or industry accepted standard and when referenced in the type design of the particular aircraft.

9. UNAPPROVED PARTS

- 9.1 Parts not meeting the criteria described in 2.1 and 2.2 above are considered to be unapproved. Any part not supported by the required documentation would also be considered to be unapproved. Unapproved parts also include those parts improperly returned to service, for example:
- (a) parts supplied directly to the end user by a subcontractor without direct shipment authority from the design approval holder and the State of Manufacture to do so;
 - (b) parts maintained or approved for return to service by a person or organization not approved to do so;
 - (c) parts not maintained in accordance with the requirements of the applicable approved data; and

- (d) parts that have reached their life limit, including, if applicable, any shelf-life limit.

10. SUPPORTING DOCUMENTATION

- 10.1 A documentation process providing written evidence of the acceptability of a part is an essential element of any system designed to ensure that only approved parts are installed on an aircraft. Such a process is intended to provide all relevant information concerning the part to which it refers sufficient to enable a potential installer to readily ascertain its status.
- 10.2 Such documents will contain information relating to:
 - (i) the authority under which it is issued;
 - (ii) reference identification for the purposes of traceability;
 - (iii) name, address and approval reference of the issuing organization;
 - (iv) work order, contract or invoice number;
 - (v) quantity, description, part number and, if applicable, serial number of the part;
 - (vi) relevant information concerning any life limitations, including in-service history records;
 - (vii) the signature and approval reference of the person issuing the document; and
 - (viii) whether the part is new or used.

11. PRECAUTIONS TO PREVENT INADVERTENT ACCEPTANCE OF UNAPPROVED PARTS

- 11.1 Documentary evidence of compliance with an approved process will not in itself provide a guarantee against the installation of unapproved parts if the original supplier of such parts knowingly provides false information or otherwise sets out to deceive.
- 11.2 It is always necessary to have secondary defences in place designed to give early warning of unapproved parts prior to their release for installation. The primary defence in such cases is a strong, well-informed and alert parts ordering and receiving system which, through auditing and reports, establishes a satisfactory level of confidence in its parts suppliers and which:
 - (a) ensures a continual correlation between parts ordered and parts received;
 - (b) is alert to any unauthorized alterations to supporting documentation and to any inability of the supplier to supply the required documentation;
 - (c) is aware if a quoted price for the part is significantly lower than that quoted by other suppliers;
 - (d) is aware that delivery times are significantly shorter than those quoted by other suppliers; and

- (e) is aware of parts packaging methods used by approved parts manufacturers, maintenance organizations and distributors, and can detect deviations from these methods.

11.3 Organizations, particularly approved maintenance organizations and operators, should ensure that all those staff who have routine contact with parts, including especially buyers, stores staff, mechanics and certifying staff, are fully aware of the dangers posed by unapproved parts and also the likely sources. Ample warnings should be given to such staff about accessing any unapproved parts database. Approved maintenance organisations and operators will also need to ensure that their parts suppliers are fully integrated into the reporting network, and audits will be necessary among staff at intervals to ensure that all remain vigilant to the problem.

12. DETECTION PROCEDURES

12.1 General

12.2 Organizations involved in the manufacture, distribution or maintenance of aeronautical products should ensure that their quality control systems include procedures for detection of unapproved parts. The following guidelines offer a means by which 'approved parts' and their sources may be assessed.

12.3 Procurement process

12.3.1 A procedure to prevent procurement of unapproved parts should be established prior to purchasing parts and materials for installation in type certificated products. This procedure should include the following elements as a minimum:

- (a) Methods to establish qualified suppliers who are authorized to manufacture and or distribute parts they supply; and
- (b) Criteria to identify and screen potential suppliers of unapproved parts. The criteria should include the following considerations:
- (c) The quoted price or the price advertised in trade magazines is significantly lower than the price quoted by other suppliers of the same part;
- (d) A delivery schedule that is significantly shorter than that of other suppliers of the same part when existing stocks are exhausted;
- (e) The inability of a supplier to provide drawings, specifications, overhaul manuals, or substantiating data demonstrating the conformity of the part's repair/overhaul;
- (f) A distributor and/or supplier's inability or unwillingness to provide substantiating documentation that the part was produced pursuant to a National Airworthiness Authority's approval; or inspected, repaired, overhauled, preserved or modified in accordance with the regulations; and,
- (g) Sales quotes or discussions that create the perception that an unlimited supply of parts, components, or material is available to the end user.

12.4 Acceptance Procedures

12.4.1 These procedures should include a means of identifying Suspected Unauthorized Parts during the receiving inspection and prevent their acceptance. The following suggested actions are provided as a guide:

- (a) Confirm the packaging of the part identifies the supplier or distributor, and is free from alteration or damage;
- (b) Verify that the actual part and delivery receipt reflect the same information as the purchase order regarding part number, serial number, and historical information, if applicable;
- (c) Verify that the identification on the part has not been tampered with. For example, serial number stamped over, label or part/serial numbers improper or missing, vibro-etch or serial numbers located at other than the normal location;
- (d) Ensure that the shelf life and/or life limit has not expired, if applicable;
- (e) Conduct a visual inspection of the part and supporting documents to the extent necessary to determine if the part is traceable to a Civil Aviation Authority's approved source. The following are examples of positive forms of identification:
 - Authorized Release Certificate
 - FAA Form 8130-3, Airworthiness Approval Tag;
 - EASA Form 1
 - New Zealand CAA Form 1, Authorized Release Certificate;
 - approved internal organization maintenance records or release documents with approval for return to service;
 - appropriate TSO markings;
 - appropriate Parts Manufacturer Approval markings;
 - shipping ticket / invoice from Production Approval Holder; or
 - Direct ship authority letter from Production Approval Holder.
- (f) Evaluate any visible irregularities. For example, altered or unusual surface, absence of required plating, evidence of prior usage, scratches, new paint over old, attempted exterior repair, pitting or corrosion;
- (g) Conduct random sampling of standard hardware packaged in large quantities in a manner which corresponds to the type and quantity of the parts; and
- (h) Segregate parts of questionable nature and attempt to resolve issues regarding questionable status of each part. For example, obtain necessary documentation if inadvertently not provided, or determine if irregularities are a result of shipping damage and handle accordingly.

Note: Rejected items should be reported to CAAB

12.5 Supplier evaluations

12.5.1 Procedures to conduct audits of suppliers on a scheduled basis, to ensure that suppliers have established and continue to maintain the quality system specified in purchase orders, should be developed. The following are examples of elements that should be included in an audit program:

- (a) continued validity of National Airworthiness Authority's approval, if applicable;
- (b) design data control, to include latest revision, if applicable;
- (c) supplier control;
- (d) material handling/control;
- (e) manufacturing/assembly controls;
- (f) tool and gauge control;
- (g) tests and inspections; and
- (h) Records.

12.6 Summary guidance

12.5.1 Regulations require that type-certificated products conform to their type design. Aircraft owners, operators, manufacturers, maintenance organizations, and parts suppliers and distributors are encouraged to continually inspect their aircraft and/or parts inventories to ensure only approved part numbers are present. In the event Suspected Unauthorized Parts (SUPs) are found, it is recommended that they be quarantined to prevent installation until a determination can be made regarding their origin and eligibility for installation.

13. UNAPPROVED PARTS REPORTING

13.1 Systems used by end users to report to Type Certificate holders and regulatory agencies are intended to provide widespread warning of the detection of unapproved parts so that operators of similar equipment can be made aware as soon as possible. In view of the likely random appearance of unapproved parts, access to a reporting system should be easy and available at all reasonable times. It follows that publicity for the reporting system (and the programmes generally) should be widespread.

13.2 In order to obtain as much information as possible from a report of a suspected unapproved part, it is necessary to have a standardized reporting format. Information required will include:

- part description and from where received;
- part and (if applicable) serial numbers;
- Particular colours, markings, dimensions and features common to the unapproved part which distinguish it from the genuine item; and
- The nature of any accompanying documentation.

13.3 At any time a part is deemed to be suspect, it and any accompanying documentation should be quarantined immediately and held until the body responsible for processing the reports is satisfied that the evidence is no longer required or until the authenticity of the part has been established.

13.4 Some reports of suspected unapproved parts will eventually turn out to be false as further information becomes available in the form of supporting documentation, etc. A successful reporting system should accept such false alarms and the wasted effort they generate in the knowledge that to discourage such might eventually lead to the suppression of a genuine report.

- 13.5 A relatively simple database, preferably computer driven, will be required to maintain a record and allow easy processing of reports of suspected unapproved parts. The database should be capable of interrogation such that any common thread within the reports received is readily identified by keyword access. The database itself can be a dedicated system or part of a much larger general occurrence reporting system.
- 13.6 In view of the international nature of the aviation industry and in particular the known international nature of the generation and distribution of unapproved parts, the ability to link national databases is obviously advantageous, the unimpeded cross-flow of information being essential in successfully combating the problem.

14. REPORTING GUIDELINES

14.1 General

- 14.1.1 To assist in reporting SUPs, CAAB has produced a SUP report Form (CAAB Form AIR 300). This form provides a standardized format which facilitates the submission of complete data and reduces the time and cost associated with processing the reports. The details on CAAB Form AIR 300 may be entered by either machine/computer printing or by hand using block capitals.
- 14.1.2 An electronic version of CAAB Form AIR 300 is available for download via the Internet from the CAAB web site (<http://www.caab.co.bw>). A completed form can be submitted electronically via the Internet to CAAB.
- 14.1.3 When reporting a SUP, as much descriptive information should be provided as possible on the part. Any supporting information, such as photographs and sketches of the suspected part, is also appreciated. However, SUPs should not be physically submitted to CAAB unless specifically requested by CAAB.
- 14.1.4 The use of abbreviations should be kept to a minimum, unless the particular term is universally used and no confusion could be caused as a result.

14.2 Reporting to CAAB

- 14.2.1 When a SUP is discovered, CAAB Form AIR 300 should be submitted immediately to CAAB by any of the following means:

- **By Mail:**

Mark 'IN-CONFIDENCE' if confidentiality is required and mail from anywhere within Botswana, to the following address:

Civil Aviation Authority of Botswana

P.O. Box 250

Gaborone

(Attention: Airworthiness Section - SUP Report)

- **By Fax:**

When confidentiality is not required, you can Fax the completed SUP Report Form to the following number:

00267 3930165

(Attention: Airworthiness Section - SUP Report)

- **By Internet:**

A completed CAAB Form AIR 300 can be submitted electronically via the internet to CAAB: www.caab.co.bw

14.3 **Reporting to Type Certificate Holder**

14.3.1 In addition to reporting a SUP to CAAB, it is also an International Civil Aviation Organization (ICAO) requirement for the Type Certificate holder of the aircraft concerned to be notified. The contact details for the Type Certificate holder will vary for each aircraft. Use of an internet search engine should provide these contact details if not already known. Use of CAAB Form AIR 300 to convey details of the SUP to the Type Certificate holder is considered an acceptable form of compliance with the ICAO requirement.

15. **CAAB HANDLING OF REPORTED INFORMATION**

15.1 Although submission of the reporter's name is strictly voluntary it is highly desirable information that will enable CAAB to verify facts and follow up with the reporter during the course of the investigation. Keeping in mind CAAB's responsibilities with respect to the dissemination of flight safety information, the reporter's name will not be disclosed unless required by law.

15.2 CAAB's policy is to encourage persons to report safety breaches or other circumstances affecting safety. Generally, CAAB will not cause prosecution or enforcement proceedings to be instituted in respect of unintentional or inadvertent breaches of BCARs, but this will depend upon all the circumstances of the breach.

16. **NOTIFICATION OF SUPs TO INDUSTRY**

16.1 CAAB will disseminate safety information resulting from its investigation of SUP reports and SUP notifications received from other Civil Aviation Authorities.

16.2 Based on the information discovered by the SUP investigation and any other relevant information, CAAB will determine whether the unsafe condition warrants the issuance of an Airworthiness Directive (AD) pursuant to Civil Aviation (Airworthiness) Regulation 31.

16.3 If the investigation reveals that an unapproved part may exist but an AD is not warranted, CAAB will advise the affected individuals organizations by direct mail, or issue an Advisory Circular as appropriate. The Advisory Circulars are available on the CAAB website: (<http://www.caab.co.bw>)

17. **PARTS STOCKISTS AND DISTRIBUTORS**

17.1 It is recognized that parts stockists and distributors have a significant influence over preventing the use of unapproved parts. Such organizations have an established commercial role of stocking or obtaining parts, often at short notice.

17.2 In airworthiness terms, the parts supplier's role is simply that of a holder of a part and its supporting data for a limited period, the part and data being passed in their entirety to the purchaser. The most effective control is exercised by the purchaser of the parts by ensuring that the part is correct and that the documentation truly reflects the status of the part. Further assurance is provided by the installer purchasing only from those suppliers having a known satisfactory record.

- 17.3 Parts distributors may also break down large orders of identical parts into smaller lots for shipment to end users. In this, case they should provide documentation that the parts came from the original large order and either issue a second set of airworthiness documentation, if authorised by their State regulatory authority to do so, or attach a copy of the original airworthiness documentation.

18. PARTS REMOVED FROM AN AIRCRAFT NO LONGER IN SERVICE

- 18.1 Aircraft withdrawn from service are often used as a source of spare parts, a process sometimes described as “parting out”. These parts, although serviceable at the time the aircraft was placed in storage, may have been affected adversely by storage conditions, including especially environmental factors, or by the length of storage.
- 18.2 The records for the aircraft and its parts prior to the aircraft being placed into storage will need to be researched in order to ascertain the previous maintenance history, and airworthiness directive, modification and repair status of the parts being removed. Any unusual events immediately prior to storage, e.g. heavy landings or lightning strikes, will also have to be considered when deciding on the serviceability of the parts being removed.
- 18.3 It is important that the part removal process be planned and controlled in a manner as close as possible to that adopted for routine maintenance tasks on in-service aircraft. The following points in particular should be considered:
- (a) the means by which the part is removed should be in accordance with the normal maintenance data (e.g. maintenance manuals), using the tooling specified;
 - (b) adequate access equipment should be provided;
 - (c) if conducted in the open, disassembly should cease during inclement weather;
 - (d) all work should be carried out by appropriately qualified maintenance personnel;
 - (e) all open connections should be blanked;
 - (f) a protected and enclosed quarantine storage area for the parts being removed should be provided in the immediate vicinity of the work area and;
 - (g) normal maintenance documentary controls should be used, e.g. the use of work sheets or cards to record component removals, and label identification to show serviceability status.
- 18.4 An assessment for condition and eventual return to service of each removed part will need to be conducted by a suitably approved organization. The extent of the work necessary before the part is returned to service may, depending on the factors noted in paragraph 20.1, range from a simple external visual inspection to a complete overhaul.

19. PARTS RECOVERED FROM AN AIRCRAFT INVOLVED IN ACCIDENTS

- 19.1 When an aircraft has been involved in an accident, the title to the salvage may pass from the insured owner to other persons (e.g. aircraft insurers); this salvage may be offered for sale either complete or as separate aircraft items in

an “as is, where is” condition. While some items may be totally unaffected by the accident or incident which caused the aircraft to be declared as salvage, it is essential to obtain clear evidence that this is the case. If such evidence cannot be obtained, the item may not be returned to service.

- 19.2 Before overhaul and reinstallation can be considered, all such items must therefore be subject to airworthiness assessment and inspection in the light of adequate knowledge of the circumstances of the accident, subsequent storage, and transport conditions, and with evidence of previous operational history obtained from valid airworthiness records. Confirmation of this assessment in the form of an airworthiness release is essential.
- 19.3 In particular, if a crash load is sufficient to take any part above its proof strength, residual strains may remain which could reduce the effective strength of the item or otherwise impair its functions. Loads higher than this may of course crack the item, with an even more dangerous potential. Further, a reduction in strength may be caused by virtue of the change of a material’s characteristics following overheat from a fire. It is therefore of the utmost importance to establish that the item is neither cracked, distorted or overheated. The degree of distortion may be difficult to assess if the precise original dimensions are not known, in which case there is no option but to reject the item. Any suggestion of overheating would be cause for a laboratory investigation into significant change of material properties.

20. DISPOSAL OF SCRAPPED PARTS

- 20.1 Those responsible for the disposal of scrapped aircraft parts and materials should consider the possibility of such parts and materials being misrepresented and sold as serviceable at a later date. Caution should be exercised to ensure that the following types of parts and materials are disposed of in a controlled manner that does not allow them to be returned to service:
- (i) parts with non-repairable defects, whether visible or not to the naked eye;
 - (ii) parts that are not within the specifications set forth by the approved design, and cannot be brought into conformity with applicable specifications;
 - (iii) parts and materials for which further processing or rework cannot make them eligible for certification under an approved system;
 - (iv) parts subjected to unacceptable modifications or rework that is irreversible;
 - (v) life-limited parts that have reached or exceeded their life limits, or have permanently missing or incomplete records;
 - (vi) parts that cannot be returned to an airworthy condition due to exposure to extreme forces or heat; and
 - (vii) principal structural elements removed from a high-cycle aircraft for which conformity cannot be accomplished by complying with the mandatory requirements applicable to ageing aircraft.
- 20.2 Scrapping of parts and materials may not be appropriate in certain cases when there is an on-going evaluation process to determine whether a part or material may be restored to an airworthy condition. Examples of these cases include the extension of life limits, the re-establishment of in-service history records, or the

approval of new repair methods and technologies. In these cases, such parts should be segregated from serviceable parts until the decision has been made as to whether these parts can be restored to an airworthy condition, or be scrapped.

- 20.3 Scrapped parts should always be segregated from serviceable parts and when eventually disposed of should be mutilated or clearly and permanently marked. This should be accomplished in such a manner that the parts become unusable for their original intended use and unable to be reworked or camouflaged to provide the appearance of being serviceable.
- 20.4 When scrapped parts are disposed of for legitimate non-flight uses, such as training and education aids, research and development, or for non-aviation applications, mutilation is often not appropriate. In such cases the parts should be permanently marked indicating that they are not serviceable; alternatively, the original part number or data plate information can be removed or a record kept of the disposition of the parts.



.....
For/Civil Aviation Authority of Botswana



End of Advisory Circular

Intentionally left blank



SUSPECTED UNAPPROVED PARTS REPORT

		SUP No. (CAAB USE only)	
Aircraft/Equipment manufacturer and Model		Part Name:	
Part No:	Serial No:	Quantity	
Place of Occurrence/report		Date and Time:	

WHO SUPPLIED OR REPAIRED THE PART?

Name:	Organisation	Phone
Address		

WHERE WAS PART DISCOVERED?

Date part was discovered	If part was fitted to aircraft, registration Mark		
Name	Organisation	Phone	
Address			
Check one that applies. <input type="checkbox"/> AOC Holder <input type="checkbox"/> AMO <input type="checkbox"/> LAME <input type="checkbox"/> Distributor <input type="checkbox"/> Other			

DESCRIPTION OF EVENT (Include circumstances when part was found, identification and marking, why you think the part is not approved)

Attach additional information if required.

REPORTER'S DETAILS

Name.	Organisation	Phone	Date
Address			
Do you want to remain confidential? <input type="checkbox"/> Yes <input type="checkbox"/> No		Do you wish to receive an acknowledgement letter <input type="checkbox"/> Yes No <input type="checkbox"/>	

RECEIVED BY: _____ PLACE: _____ DATE: _____