



Advisory Circular

Subject: Standardized Procedures for
Requesting Approval of Data for
Major Repairs and Major Alterations

Date: DRAFT
Initiated by: AFS-360

AC No: 43-210A
Change:

1 INTRODUCTION.

1.1 Purpose. This advisory circular (AC) describes a standardized procedure for requesting approval of technical data associated with major alterations/repairs for certificated products. This AC also provides:

1. Information that can help determine if a proposed repair/alteration requires approved data,
2. Guidance and standardized procedures for obtaining field approval of data, and
3. Instructions for completing the field approval checklist (see Appendix A).

This AC is not mandatory and does not constitute a regulation. This AC describes an acceptable means, but not the only means, to obtain approved data for a major repair or alteration. However, if you - whether you're an aircraft owner, operator, or aviation maintenance technician, collectively termed an applicant - use the means described in the AC, you must follow it in all important respects.

1.2 Applicability. This AC applies to applicants who request data approval for a major repair/alteration.

1.3 Cancellation. This AC cancels AC 43-210, Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs, dated 02/17/2004 and AC 21-47, Submittal of Data to an ACO, a DER or an ODA for a Major Repair or a Major Alteration.

1.4 Regulatory Basis. Title 14 of the Code of Federal Regulations (14 CFR) part 43, § 43.7 specifies persons authorized to approve an aircraft or aircraft component for return to service after maintenance, preventative maintenance, rebuilding, or alteration. We, the Federal Aviation Administration (FAA), have approved technical data for major repairs or major alterations to type certificated (TC) products. The following CFR references require use of this data:

1. Title 14 CFR part 43, §§ 43.7(d) and 43.17(e)(2),
2. Title 14 CFR part 65, § 65.95(a)(1),

3. Title 14 CFR part 121, § 121.379(b),
4. Title 14 CFR part 135, § 135.437(b), and
5. Title 14 CFR part 145, § 145.201(c)(2).

Title 14 CFR part 1, § 1.1 defines major alterations/repairs, while part 43, appendix A, § A(a) further defines a major alteration, and part 43, appendix A, § A(b) further defines a major repair. For clarity, a minor alteration is not a major alteration, and likewise, a minor repair is not a major repair. 

- 1.5 Repair and Alteration Classification.** Only those persons with part 43, § 43.7, authorization may approve an aircraft, airframe, engine, propeller, appliance, or component part for return to service after repair or alteration. You must perform major repairs and alterations using technical data approved by the Administrator. You may perform minor repairs and alterations using technical data acceptable to the Administrator. This AC includes flowcharts (Figures 3-1, Field Approval Process and 3-2, Determination of Major or Minor Alteration or Repair) to help classify a repair/alteration.

For assistance, you may use the Major Repair and Alteration Data Approval job aid at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs300/media/Major_Repair_Alteration_Job-Aid.pdf. The job aid lists types of alterations and how applicants typically classify them.

- 1.6 Roles and Responsibilities.** Only applicants – not aviation safety inspectors (ASI) - must obtain, organize, and submit data to the ASI for review and approval. Refer to the current editions of FAA Order 8300.16, Major Repair and Alteration Data Approval, Chapter 9, for more information on roles and responsibilities.

2 DATA.

- 2.1 Definition of Data as it Relates to a Repair or Alteration.** In its broadest sense, data is recorded information. Data supporting a repair or alteration, such as a data package, consists of drawings and specifications, including a list of drawings and specifications, which define configuration and design features of a particular article, repair, or alteration. Data may be classified relative to its type or its approval status.

2.2 Classification of Technical Data.

2.2.1 Types of Data.

- 2.2.1.1 Descriptive Data.** Describes the design of the repair or alteration, and should include reference to (1) installation methods, (2) materials, (3) fabrication processes, (4) dimensions, and (5) tolerances. The description may also include intended function and how the alteration is appropriate to the aircraft.

2.2.1.2 Substantiating Data. Shows that the design complies with applicable regulations and that you have addressed all appropriate technical considerations.

2.2.2 Approval Status.

2.2.2.1 Approved Data. Data that has been reviewed and formally approved by the **ASI or other appropriate entity.** Such data shows the product will be returned to its original or properly altered condition. 

2.2.2.2 Acceptable Data. Data used without formal FAA review. Such data may show that a product will be returned to its original or properly altered condition, or may establish that the product complies with applicable airworthiness standards.

2.2.3 Previously Approved Data. Refers to data approved for a similar purpose in a different application. May form the basis of data for an intended application. Will require FAA review and approval to become approved data. You must consider all differences, deviations, inclusions, and exclusions between the original and current application before you can use the data. Mere reference to the existence of previously approved data is not enough to use the data for an intended application. Figure 2-1, Common Sources of Approved Data for Repairs or Alterations lists typical sources by which you can obtain previously approved data. You should consider the following items when evaluating previously approved data: 

2.2.3.1 Product Certification Basis. If the certification basis of an intended application and an original application are different, you must make a comparison of the two and differences addressed. This comparison should include the appropriate airworthiness standard.

2.2.3.2 Special Conditions. If test personnel developed and approved data for a product with special conditions, you must consider these conditions.

2.2.3.3 Equivalent Level of Safety (ELOS) findings. If test personnel developed and approved data for a product with ELOS findings, you must consider these findings.

2.2.3.4 Exemptions. If test personnel developed and approved data for a product design based on an exemption to an airworthiness standard, you must consider the exemption impact.

2.2.3.5 Applicability. You must review the data to determine applicability to intended use.

Figure 2-1. Common Sources of Approved Data for Repairs or Alterations

Type Certificate Data Sheet (TCDS). Refer to the current edition of FAA Order 8620.2, Applicability and Enforcement of Manufacturer's Data, for guidance.
Repair data from the current edition of AC 43.13-1, Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair as approved data for non-pressurized areas of civil aircraft, and the AC chapter, page, and paragraph listed in block 8 of FAA form 337, Major Repair & Alteration (Airframe, Powerplant, Propeller, or Appliance), when the applicant has determined that it is: <ul style="list-style-type: none"> • Appropriate to the product that receives repairs; • Directly applicable to the repair being made; and • Not contrary to the airframe, engine, propeller, or appliance manufacturers' repair data or instructions.
Alteration data from the current edition of AC 43.13-2, Acceptable Methods, Techniques, and Practices — Aircraft Alterations as approved data for major alterations for non-pressurized areas of civil aircraft when the AC chapter, page, and paragraph are listed in block 8 of FAA Form 337, when the user has determined that it is: <ul style="list-style-type: none"> • Appropriate to the product being altered; • Directly applicable to the alteration being made; and • Not contrary to the airframe, engine, propeller, product, or appliance manufacturer's data.
Airworthiness Directives (AD).
Appliance manufacturer's manuals or instructions, unless specifically not approved by us, as approved data for major repairs.
Data describing an article used in an FAA-approved alteration under a parts manufacturer approval (PMA).
Data developed during the FAA authorization of an article for production under a technical standard order (TSO).
Data issued by the Minister of Transport Canada for parts or appliances with no current TSO. The installation manual provided with the appliance includes the environmental performance qualification statement.
Designated Engineering Representative (DER)-approved data, including repair specifications, within limitations on the DER's authorization.
Organization Designation Authorization (ODA)-approved data, within limitations in the ODA holder's procedures manual.
FAA-approved portions of structural repair manuals (SRM).
FAA-approved service bulletins (SB) and service letters (SL) or similar documents as documented in the current edition of AC 20-77, Use of Manufacturers' Maintenance Manuals.
Foreign bulletins, for use on U.S.-certificated foreign-designed aircraft, when approved by the foreign authority within the provisions of a bilateral agreement with the United States or as listed in TCDS notes.
Original aircraft manufacturer's service and repair data per current regulations, for major repairs on non-pressurized elements of airplanes 12,500 pounds or less maximum certificated takeoff weight provided repair personnel confirm: <ul style="list-style-type: none"> • Data is appropriate for the specific make and model airplane being repaired; • Data is applicable to the specific make and model airplane being repaired; and • The repair does not deviate from the manufacturer's methods, techniques and practices.
United States Department of Commerce, Form ACA-337 dated prior to October 1, 1955, provided the data is appropriate, directly applicable, and not contrary to regulatory requirements.
Supplemental Type Certificate (STC) data, may substantiate a major alteration on a different aircraft.
FAA Form 337 used by the original alterer for approval of multiple identical aircraft

Note: Design/production approval holders, and suppliers who designed/produced 14 CFR part 21-approved articles, each respectively developed maintenance and supplier manuals using part 21-approved technical data. This technical data remains FAA-approved, without re-approval, when applicants follow part 21 design change requirements, and perform a major alteration/repair per these maintenance manuals.

3 FIELD APPROVAL PROCESS AND DATA APPROVAL.

3.1 General Information. An applicant must use approved technical data to accomplish a major alteration or repair on a product and approve the product for return to service. An applicant must perform three major steps – (1) conduct research, (2) evaluate the data, and (3) perform the repair or alteration - when performing a major alteration or repair.

Note: You should not start work until all data is approved. As indicated earlier, test personnel may not be able to use the field approval process to approve some alterations and repairs. Also, inspectors may not be able to complete the approval as requested. If an applicant starts work before the approval is finalized, that work may not conform to the repair or alteration as approved.

3.2 Conduct Research.

3.2.1 Plan and Document the Repair or Alteration. You should review the repair or alteration to be performed. The final result must be a safe and airworthy product. You should determine the certification basis of the altered/repared product, and also what data you need to describe and substantiate the repair or alteration. Typical data includes analysis, drawings, photographs, specifications or test data. 

3.2.2 Determine Eligibility. Determine if the repair/alteration is a minor change to the product's type design, and if so, is it a major or a minor repair/alteration. To determine if a repair/alteration is major or minor, refer to part 43, appendix A. Figure 3-2 is a flowchart of the field approval evaluation process based on appendix A. 

3.2.2.1 Minor Repair or Minor Alteration. You may perform a minor repair/alteration using acceptable data, and without approved data. You may approve the repair/alteration for return to service using a standard logbook entry per part 43, § 43.9.

3.2.2.2 Major Repair or Major Alteration. You must perform a major repair or alteration using approved data. If all the gathered data is not approved, determine if the field approval process is available for that repair or alteration. The field approval process is not available for all major repairs/alterations, and some aircraft are not eligible for field approvals. The following paragraphs list some reasons for not using the field approval process for certain major repair or major alterations:

3.2.2.2.1 Major Repairs/Alterations. Major repairs/alterations that are major changes to type design require an amended TC or STC. The field approval process is

not available in these cases. The current edition of AC 21-40, Guide for Obtaining a Supplemental Type Certificate, details the STC application process for a broad audience, while FAA Order 8110.4, Type Certification (current edition), provides that same detail for ASIs. Personnel may also find useful the Major Repair and Alteration Data Approval job aid associated with FAA Order 8300.16. This job aid lists alterations governed by Order 8300.16 and alterations we want processed as major changes in type design.

3.2.2.2.2 Alterations and Repairs. Alterations and repairs with sufficient DER- or ODA-approved data don't need further approval. See paragraphs 3.3.8 and 3.3.9 in this AC for more information.

Note: Aircraft operating under part 121 are eligible for field approvals under certain circumstances. If you are a part 121 operator, check with the ASI before beginning a project. Designees can't issue field approvals for aircraft operated by air carriers certificated under part 121.



3.2.3 Prepare the Data Package. To organize project data and standardize the field approval process, we recommend using a standard data package (SDP). The SDP is not the only way to organize and present data to us when requesting a field approval, but using an SDP may reduce processing time. The SDP is comprised of:

1. Field approval checklist;
2. Copies of any substantiating data;
3. FAA Form 337, Major Repair or Alteration (Airframe, Powerplant, Propeller, or Appliance);
4. Compliance checklist;
5. Draft Aircraft Flight Manual Supplement (AFMS) or Rotorcraft Flight Manual Supplement (RFMS); and
6. Maintenance information.

Note: Approval of an AFMS is a separate action from major alteration data approval. The approval is indicated on the AFMS, so you don't need a separate FAA Form 337. See paragraph 4.5 of this AC for further AFMS information.

3.2.4 Gather Data. Gather and organize data describing and substantiating the proposed repair/alteration. Review Chapter 2 for data types you might use.

3.2.5 Complete the Field Approval Checklist (recommended). The checklist and instructions in Appendix B can be used to organize data and information before requesting a field approval. It is a tool to ensure your submission is complete.

3.2.6 Substantiate Applicable Requirements. Indicate the specific applicable airworthiness requirements to show compliance, including the amendment level of the regulation and

other requirements, except that you should not use general references, such as “part 25.” As shown in Appendix B, you may reference a compliance checklist, specific to descriptive data instead of listing regulatory requirements.

3.2.7 Complete FAA Form 337. Complete FAA Form 337, except for dates and signatures in blocks 6 and 7. You should enter dated signatures after completing the repair/alteration and inspecting for conformance. AC 43.9-1, Instructions for Completion of FAA Form 337 (current edition) provides guidance on how to complete this form.

3.3 **Evaluate the Data.** Review the data to determine (1) if the package is complete and inclusive, and (2) if all data has been approved. There are several methods to obtain all the approved data. We sometimes use the field approval process, with an authorized ASI or other delegated authority, to approve technical data. **Be aware that technical data, when so approved, does not constitute a “type design change approval.”** Another alternative is approval of all the data by a DER or ODA. In some cases, you might need multiple DERs when the repair/alteration deals with several disciplines, such as systems and structures.

3.3.1 The Field Approval Process. Field approvals are a method by which we approve technical data for a major repair/alteration on a single aircraft. A field approval is a one-time approval for the product or appliance to which it applies. The overall process is illustrated in Figure 3-1, and is explained in paragraphs 3.3.5 through 3.3.7 below.

A field approval may require engineering assistance or coordination with an Aircraft Certification Office (ACO). You may use the field approval process to obtain approval of acceptable data in certain cases.

Note 1: The information and process steps are provided in Figure 3-1 in a specific order to show a logical progression through the repair/alteration. We’re not implying that one step must follow another in the order presented. Several actions may take place concurrently or in a different order. The goal is that you address all necessary concerns and regulatory considerations when performing a major repair/alteration.

Note 2: The paragraph numbers next to blocks in the figure correspond to associated paragraph numbers in this order, which provide information in more detail.

3.3.2 Contact the FAA ASI. Contact a local FAA office and speak with an ASI who has field approval authority. Discuss the repair or alteration with the ASI and determine if you need to meet to review the request. Be as specific as possible about the needs, and especially about the schedule. If the ASI cannot assist an applicant with a project, the ASI may contact another ASI to help. In some cases, you may contact a properly authorized **DAR**, who may only approve data.

3.3.3 Provide Data Package to the ASI. Send a complete data package to the ASI. Using the checklist in Appendix B is one way to organize data and may help prevent omissions.

3.3.4 Aviation Safety Inspector Review Procedures.

3.3.4.1 When the ASI receives the package, the ASI will review it to determine if the field approval request is appropriate.

1. Minor alterations/repairs do not require approved data. ASIs who deny data approval requests for alterations or repairs that do not require approval must explain to the applicant the reason for the denial and, if requested, provide the explanation in **hard copy** or  electronic form.
2. The Major Repair and Alteration Data Approval job aid describes repairs and alterations within the scope of a field approval. **If the ASI determines that the alteration requires an STC**, and if the applicant is the design approval holder (DAH), the ASI should  inform the applicant to apply for an STC or amended TC.
3. The ASI should examine the data to see if it has been approved. If all the required data is approved, then further approval is not required. If any required technical data is not approved, then you can obtain approval through a DER or a field approval.

3.3.4.2 After the ASI has reviewed the data package and/or inspected the aircraft, and can approve the repair/alteration, the ASI may (1) approve the data package only, or (2) approve the repair/alteration on the FAA Form 337 by physical inspection. The ASI will sign and date block 3 indicating approval. The ASI enters one of two statements:

4. First statement: “The data identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in § 43.7.”

Note: This statement is entered on block 3 of FAA Form 337 when the ASI reviews a data package and completes data approval.

5. Second statement: “Approval by Physical Inspection, Demonstration, Testing, etc. One Aircraft: The repair or alteration identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in § 43.7.”

Note: This statement is entered on block 3 of FAA Form 337 when the ASI makes a physical inspection of the aircraft, or the applicant satisfactorily performs a demonstration or other type of test and the ASI completes an installation approval.

3.3.5 Designated Engineering Representative (DER) Data Approval.

3.3.5.1 A properly authorized DER is a designee of the FAA whom an applicant may employ to provide approved technical data to support a major repair/alteration. A DER's authority is limited to specific functions, and data from more than one DER may be necessary. If an applicant has determined that a single DER has, or multiple DERs have, provided necessary approved data for the repair/alteration, before involving the ASI then no field approval is required.

3.3.5.2 We have referenced DER authorizations and limitations in FAA Order 8110.37, Designated Engineering Representative (DER) Guidance Handbook (current edition). This reference includes repair specification DER (RS-DER) authorizations and limitations, and general guidance on approving data for major repairs/alterations. A list of current DERs and their appointed functions and authorizations is available on http://www.faa.gov/other_visit/aviation_industry/designees_delegations/find_designees/.

Note: Although DERs are not authorized to approve block 3 of Form 337, you may use DER-approved data as a basis for a repair/alteration in support of Form 337. However, when you have obtained sufficient DER-approved data that addresses requirements in parts 21 and 43, the approval process applicable to the alteration is complete. **An ASI can then inspect the product for conformity and return it to service without a further finding under block 3 on Form 337.** The person performing the alteration - not the DER - is then responsible for a conformity inspection and for return to service approval of the installation.



3.3.6 Organization Designation Authorization (ODA) Data Approval. You may employ an ODA holder to provide approved technical data to support a major repair/alteration. If you employ an ODA before involving the ASI and the applicant has determined that the ODA has provided all the approved data necessary for the repair/alteration, then no field approval is required.

3.3.6.1 TC/STC ODA Holder with Specific Authority. A TC/STC ODA holder with specific authority for major repairs/alterations may approve data within its authority and limitations. The data approved by an ODA holder **may not** adequately cover every aspect of the repair/alteration. If a major repair, alteration, and airworthiness (MRA) ODA holder approves all aspects of the major repair/alteration data, then no field approval is necessary.



3.3.6.2 ODA Authorizations and Limitations. For ODA authorizations and limitations, and general guidance on approving data for major repairs/alterations, refer to FAA Order 8100.15 Organization Designation Authorization Procedures (current edition). A list of authorized ODA holders is available on the FAA Designees and Delegations web page:

http://www.faa.gov/other_visit/aviation_industry/designees_delegations/find_designees/

Note: The person performing the alteration, not the DER or ODA, must conform and approve the installation **for** DER or ODA-approved data. DER or ODA data does not constitute a field approval, but is approved data that, like other approved data, can be used for major repairs/alterations without further approval if the data addresses the entire repair/alteration. In this case, an applicant does not need to request a field approval from us. 

- 3.4 Perform Repair or Alteration.** After the repair or alteration data is approved, an applicant can alter or repair the aircraft or one of its components. When the work is complete, you should review the requirements of 14 CFR part 91, § 91.407, and determine if a flight check is required. Complete FAA Form 337 and follow procedures in part 43, appendix B.

Figure 3-1. Field Approval Process

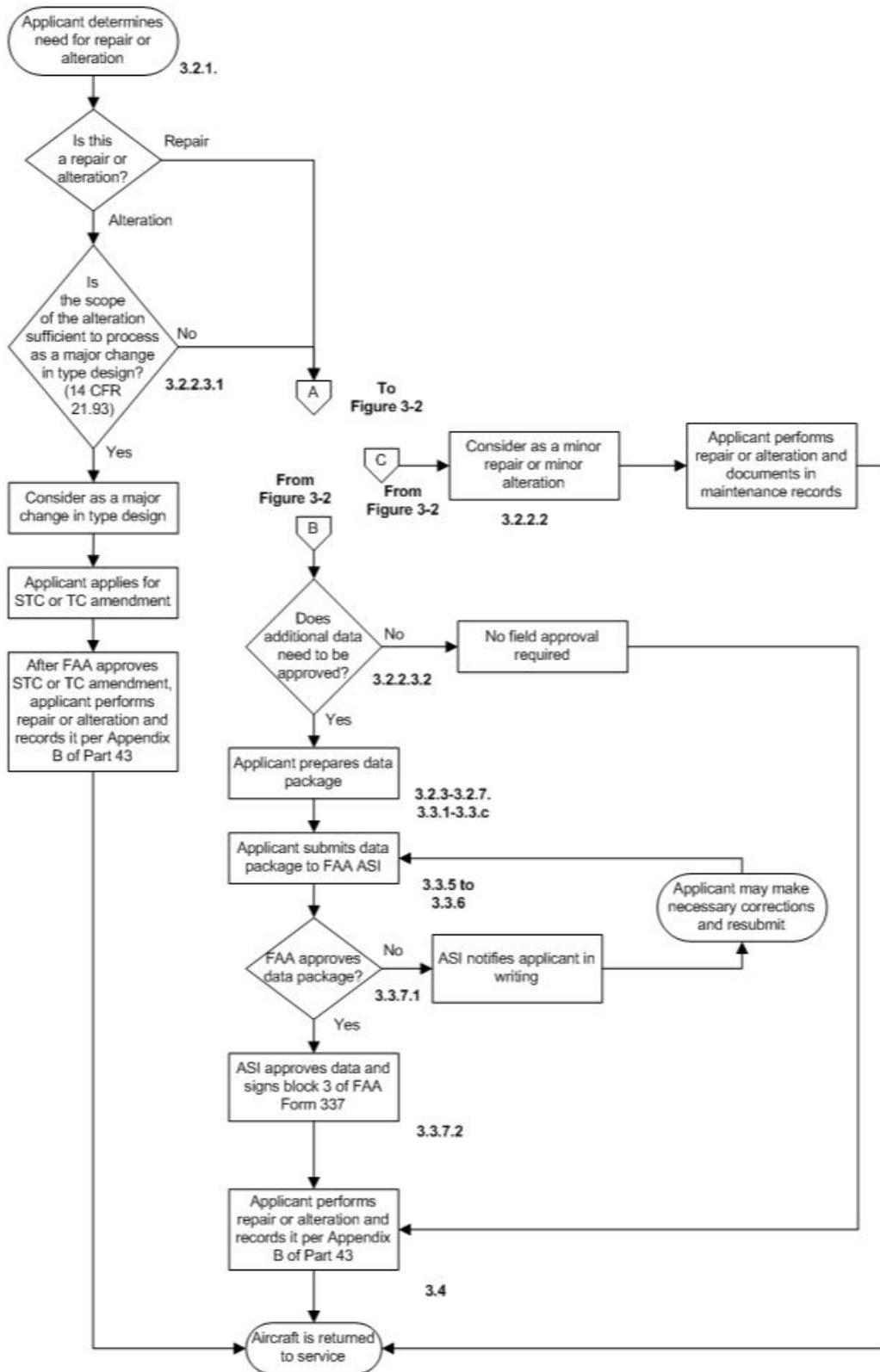
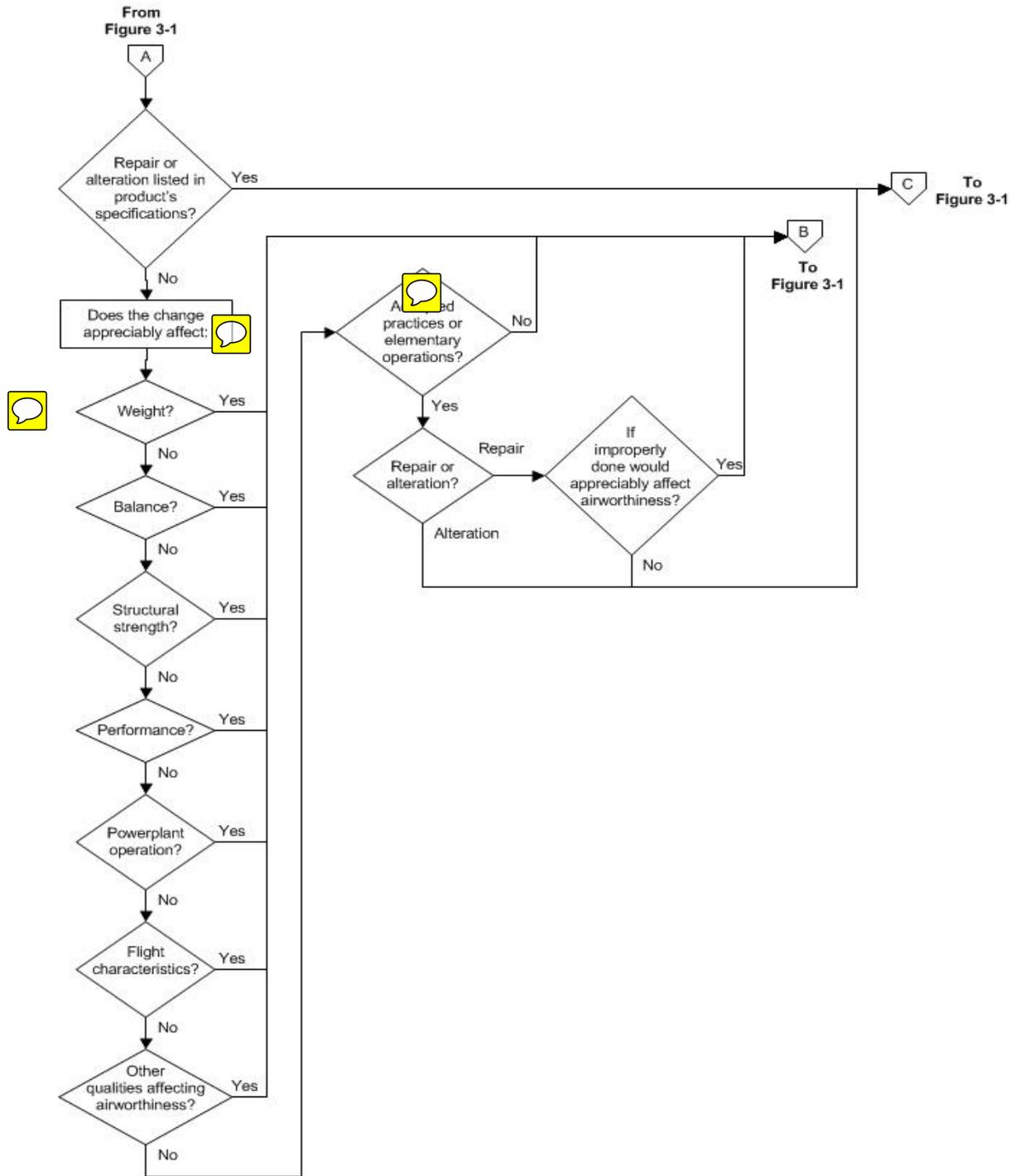


Figure 3-2. Determination of Major or Minor Alteration or Repair



4 FLIGHT MANUAL SUPPLEMENTS.

4.1 General Information. Alterations that result in a change to limitations, procedures, performance, or loading information from a current Aircraft Flight Manual (AFM) or placards, require an applicant to develop revised or supplemental information as addressed in paragraph 4.3 of this AC.

4.2 Aircraft Flight Manuals. Aircraft operating procedures and performance limitations are typically provided as:

1. AFMs, including either Airplane Flight Manuals or Rotorcraft Flight Manuals;
2. Markings or placards; or
3. Combinations of the above.

4.3 Manual Supplements. Supplemental information should be provided by one of the following methods:

1. If the aircraft has an AFM, the supplemental information must appear in an Airplane Flight Manual Supplement (AFMS) or Rotorcraft Flight Manual Supplement (RFMS).
2. If the aircraft does not have an AFM, the applicant should create a Supplemental Airplane Flight Manual (SAFM) so necessary information is available to the pilot. A SAFM complements a pilot's operating handbook (POH), which may not have specific FAA approval. Procedures for creating and approving a SAFM are the same as those for an AFMS.
3. You may present the supplemental information either as modified, or as additional markings and placards in aircraft type-certificated before AFMs were required.

4.3.1 If you substantiate a major alteration based on data from a previous approval, you **must** include a flight manual supplement if the previous approval had one. For the purposes of this guidance, AFMSs include RFMSs and SAFMs, as well. 

4.4 Format and Content. The AFMS or placards must contain any new or changed (1) limitations, (2) emergency or abnormal operating procedures, (3) normal operating procedures, (4) performance, and (5) system operating instructions. The supplement must match the format of the basic AFM and apply to the specific installation configuration for the installed equipment and systems. Approval of flight manual supplements should not contain conditional operation descriptions, and must be explicit for the configuration of the targeted aircraft. The current editions of AC 23-8, Flight Test Guide for Certification of Part 23 Airplanes, and AC 25.1581-1, Airplane Flight Manual, provide guidance on recommended content of an AFMS. 

4.4.1 The AFMS should include:

1. The aircraft manufacturer’s name;
2. Model number;
3. Serial number; and
4. Registration number.

4.4.2 You should include the following information, as applicable:

1. Abnormal or emergency procedures;
2. Normal operating procedures;
3. Aircraft performance; and
4. Aircraft weight and balance; and
5. Loading information.

4.4.3 You must install placards in clear view of the pilot and, as applicable, in proximity to affected equipment. Refer to 14 CFR part 23, § 23.1541; part 25, § 25.1541; part 27, § 27.1541; or part 29, § 29.1541.**4.5 Supplement Information Approval.** Approval of the supplement (including placards) is accomplished through:

1. Alterations that change the operating limits of the aircraft, aircraft engine, or propeller. These alterations would require coordination with an appropriate ACO for approval of the supplement or placard that stipulates limitations to the operation of the aircraft. See section 4.6 for details.
2. ASIs with field approval authorization, and (1) authorized specifically by Flight Standards (AFS) policy, or (2) delegated by an ACO to review and approve certain AFMSs.
3. An authorized DER/ODA who can approve an AFMS or placards.

4.5.1 Repairs/alterations not changing limitations, procedures, performance, or loading information may not require a supplement. **Alternatively, the supplemental information may consist of only system operating instructions.****4.5.2** An ASI with field approval authorization may review and grant field approval of an appropriately affixed placard characterizing operating limitations or information about certain equipment and systems. Refer to §§ 23.1541, 25.1541, 27.1541, or 29.1541. For examples of such placards - “Not For IFR” or “VFR Only” - refer to the “Kinds of Operations” paragraph in §§ 23.1525, 25.1525, 27.1525, or 29.1525.

4.6 Aircraft Certification Office Approval Process.

1. If an ASI or designee can't approve the AFMS, the ASI must forward the alteration data package - including proposed AFMS - to the ACO via a coordinated field approval process.
2. During ACO review, the ASI may route the AFMS to ACO flight-test personnel for review.
3. After review and approval of the AFMS or limitations placard, the applicant must record the AFMS approval date, document name, and number on FAA Form 337, block 8, Description of Work Accomplished. Such entry must indicate that the AFMS is inserted or affixed to the AFM or POH.
4. The ASI will advise you that equipment upgrades, such as changes to the operating system software or hardware, may invalidate the FAA-approved AFMS and trigger a subsequent review and approval of the AFMS.

Note: The AFMS approved by the ACO does not require additional approval when all other data covering the entire alteration is approved. "No Block 3 approval is needed on **FAA Form 337.**"



4.7 Additional Considerations.

- 4.7.1 Operating procedures for a newly-installed piece of equipment or system are frequently provided in an AFMS. Alternatively, you may incorporate equipment manufacturer operating manuals by reference into the AFMS.
- 4.7.2 Manufacturer operating instructions included/referenced in the AFMS for systems or equipment, such as those for navigation systems, do not require specific approval; but if included in an AFMS, the AFMS itself must be approved.
- 4.7.3 If all of the following conditions are met, an AFMS is not required:
 1. Doesn't restrict, displace, or limit required equipment;
 2. Placards can address all new limitations;
 3. Doesn't negatively affect aircraft performance;
 4. VFR use only; and
 5. Is non-required equipment.
- 4.7.4 For equipment limited to VFR, you must install a readable placard - in clear view of the pilot - stating that the equipment is only for VFR operations. If the equipment automatically displays this message on start-up, and the pilot must clear the message. An AFMS or RFMS is unnecessary, since the placard or display contains the equipment limitation.

5 Maintenance Information.**5.1 Purpose of Maintenance Information for a Major Repair or Major Alteration.**

Maintenance information provides adequate instructions to maintain the repaired or altered product in an airworthy condition.

5.2 Differences Between Maintenance Information and Instructions for Continued Airworthiness (ICA). Although maintenance information developed for major repairs/alterations has been called ICAs, there is a regulatory difference between the two.

5.2.1 ICAs are a requirement under the product certification rules of 14 CFR part 21 and the associated airworthiness standards in §§ 23.1529, 25.1529, 25.1729, 27.1529, 29.1529, part 31, § 31.82, part 33, § 33.4, part 35, § 35.4, and part 26. Specifically, 14 CFR 21.50(b) requires ICAs for design approvals applied for after January 28, 1981. For consistency with § 21.50(b) and for the purposes of this AC, a design approval holder (DAH) is the holder of a TC or a STC. ICAs are the instructions and information for the continued airworthiness of the aircraft, engine, propeller, parts and appliances. The DAH must develop and/or reference the ICAs using an applicable airworthiness certification basis or standard.

5.2.2 For this AC, major repair and major alteration maintenance information can include:

1. Additional maintenance instructions;
2. Supplemental information for the product’s maintenance manual or illustrated parts catalog;
3. Supplemental information for the product’s ICAs;
4. Supplemental information for articles or appliance maintenance manuals or illustrated parts catalog; and
5. Any other information required to maintain the product in an airworthy condition.

5.3 Benefits of Providing Maintenance Information for a Major Repair or Major Alteration.

5.3.1 When the owner/operator includes or references maintenance information in block 8 of Form 337, this gives the aircraft owner or operator the following advantages:

1. One document can reference or contain maintenance information about a major repair/alteration;
2. The maintenance information becomes a permanent aircraft record as required by § 91.417(a)(2)(vi); and
3. The owner or operator can contact the FAA registry for a replacement FAA Form 337 if the maintenance information is lost or destroyed. The owner or operator may also forward a previously-completed Form 337 and associated maintenance information if the Form 337 is not currently in the registry.

5.3.2 The additional reference to maintenance information as part of a major repair/alteration in the aircraft’s maintenance entry will ensure that maintenance personnel appropriately address maintenance of the major repair/alteration during future inspections.

5.4 Maintenance Information as Part of the Major Repair or Major Alteration Data Package. We have determined that a major repair/alteration data package must address how the major repair or major alteration affects continued airworthiness. You must develop maintenance information if a major repair/alteration affects the continued airworthiness, or must also state that a major repair or alteration doesn’t affect continued airworthiness. If a major repair or major alteration affects the airworthiness limitations section (ALS) of the ICA or a part of the ICA that requires our approval, such as described in part 26 ICA requirements, you must obtain approval of that maintenance information from an ACO/ODA for the major repair/alteration. The maintenance information checklist is a guide for an applicant to develop maintenance information using methods, techniques, and practices acceptable to us. See Figure 5-1, Major Repair or Major Alteration Maintenance Information Checklist.

5.5 Maintenance Information Under the Civil Air Regulations (CARs). For field-approved major alterations to CARs-certificated aircraft, engines, and propellers, maintenance information must meet the requirements of the original certification basis. In cases where the major alteration adds new items the CARs requirements didn’t address, the major alteration must meet applicable 14 CFR requirements. Figure 5-1 lists acceptable guidance for these installations, and also for inspections not covered by the original equipment manufacturer’s instructions.

5.6 Maintenance Information Development. Applicants must present maintenance information with an approval request.

5.6.1 Major alterations needing additional maintenance or inspections not covered by original equipment manufacturer’s instructions must have maintenance information prepared in accordance with methods, techniques, and practices acceptable to us. You should document/reference maintenance information as an attachment on block 8 of FAA Form 337. The entry – required by 14 CFR part 43, §43.9 - must refer to the maintenance information and be identified by the approval date of the FAA Form 337. You must keep the form in the aircraft’s permanent records per § 91.417(a)(2)(vi).

Maintenance information documented or referenced in block 8 of FAA Form 337 is considered acceptable to the FAA and will not be approved unless specifically required by regulation, as with changes to the ALS or part 26 requirements.

Applicants should use Figure 5-1 as a guide to help ensure they meet all applicable requirements.

5.6.2 If the repair or alteration data is approved solely by a DER, ODA or DAR, but necessitates **maintenance instructions**, you should prepare the maintenance instructions and record them appropriately in block 8 of FAA Form 337.



- 5.7 Maintenance Information Content.** Maintenance information must include specific instructions describing how to maintain affected areas for continued airworthiness. For example, maintenance information might include a new requirement for a special inspection during 100-hour or annual inspections. Such maintenance information must also include installed appliances that may impact maintainability of the product, or require periodic maintenance to ensure continued performance. When appropriate, maintenance information must also include specific instructions for determining excessive wear or deterioration, troubleshooting information, installation and removal procedures, and functional checks. You must also include servicing requirements, such as recommended fluid change intervals or lubrication schedules. In the instances that a repair/alteration must meet part 26 requirements, only the ACO may approve the maintenance information developed. The maintenance information must contain:
1. Inspection tasks and task intervals;
 2. Instructions and procedures in the aircraft maintenance manual to accomplish the tasks; and
 3. Precautions, protective procedures, and information in the standard wiring practices manual.

Figure 5-1. Major Repair or Major Alteration Maintenance Information Checklist

A/C Make _____	Model _____	S/N _____	Reg. #N _____
Revision: _____	Date: _____	System: _____	
Item	Subject		
1.	Introduction: This section briefly describes the aircraft, engine, propeller, or component that has been altered. Include any other information on the content, scope, purpose, arrangement, applicability, definitions, abbreviations, precautions, units of measurement, referenced publications, and distribution of the maintenance information, as applicable.		
2.	Description: Describe the major alteration and its functions, including an explanation of its interface with other systems, if any.		
3.	Control, operation information or special procedures, if any.		
4.	Servicing information, such as types of fluids used, servicing points, and location of access panels, as appropriate.		
5.	Maintenance instructions, such as recommended inspection/maintenance periods in which each of the major alteration components are inspected, cleaned, lubricated, adjusted, and tested, including applicable wear tolerances and work recommended at each scheduled maintenance period. This section can refer to the manufacturer's instructions for the equipment installed where appropriate, such as functional checks, repairs, and inspections. It should also include any special notes, cautions, or warnings, as applicable.		
6.	Troubleshooting information: Information describing probable malfunctions, how to recognize those malfunctions, and remedial actions to be taken.		
7.	Removal and replacement information: This section describes the order and method of removing and replacing products, parts, and any necessary precautions. This section should also describe or refer to such items as manufacturer's instructions to make required tests, trim checks, alignment, calibrations, center of gravity (CG) changes, lifting or shoring, if any.		
8.	Diagrams: Access plates and information, if needed, to gain access for inspection.		
9.	Special inspection requirements, such as X-ray, ultrasonic testing, or magnetic particle inspection, if required.		
10.	Application of protective treatments to the affected area after inspection and/or maintenance, if any.		
11.	Data: Relative to structural fasteners such as type, torque, and installation requirements, if any.		
12.	List of special tools: Special tools required, if any.		
13.	For commuter category aircraft: The following additional information must be furnished, as applicable: A. Electrical loads. B. Methods of balancing flight controls. C. Identification of primary and secondary structures. D. Special repair methods applicable to the aircraft.		
14.	Recommended overhaul periods must be noted on maintenance information when an overhaul period has been set by the manufacturer of a component or equipment. If there is no overhaul period, the maintenance information for item 14 should state: "No additional overhaul time limitations."		
15.	Airworthiness limitation (AL) section: Include any approved ALs identified by the manufacturer or Federal Aviation Administration (FAA) Certificate Management ACO (CMACO) Example: An STC incorporated in a larger field-approved major alteration may have an AL. The FAA inspector will not establish, alter, or cancel ALs without coordinating with the appropriate FAA CMACO. If there are no changes to ALs, maintenance information should state for item 15: "No additional ALs" or "Not applicable."		
16.	Maintenance information must be acceptable to the FAA. As such, changes should be documented by submitting the revised maintenance information along with the original Form 337 to the Aircraft Registration Branch (AFS-750) in Oklahoma City. An entry in the aircraft records should indicate the current revision.		

6 Administrative Matters.**6.1 Acronyms.**

1. 14 CFR Title 14 of the Code of Federal Regulations
2. AC Advisory Circular
3. ACO Aircraft Certification Office
4. AD Airworthiness Directive
5. AFM Aircraft Flight Manual
6. AFMS Aircraft Flight Manual Supplement
7. ALS Airworthiness Limitations Section
8. AML Approved Model List
9. AMOC Alternate Means of Compliance
10. ASI Aviation Safety Inspector
11. CAA Civil Aviation Authority
12. CAM Civil Aeronautics Manual
13. CAR Civil Air Regulations
14. CFR Code of Federal Regulations
15. CMACO Certificate Management Aircraft Certification Office
16. CMO Certificate Management Office
17. DAH Design Approval Holder
18. DAR Designated Airworthiness Representative
19. DER Designated Engineering Representative
20. ELOS Equivalent Level of Safety
21. FSDO Flight Standards District Office
22. GNSS Global Navigation Satellite System
23. ICA Instructions for Continued Airworthiness
24. IFO International Field Office
25. IFR Instrument Flight Rules
26. MRA Major Repair, Major Alteration, and Airworthiness (a type of ODA)
27. ODA Organization Designation Authorization
28. PMA Parts Manufacture Approval
29. POH Pilot Operating Handbook

- 30. RFMS Rotorcraft Flight Manual Supplement
- 31. RS-DER Repair Specification Designated Engineering Representative
- 32. SAFM Supplemental Airplane Flight Manual
- 33. SB Service Bulletin
- 34. SDP Standard Data Package
- 35. SL Service Letter
- 36. SRM Structural Repair Manual
- 37. STC Supplemental Type Certificate
- 38. TC Type Certificate
- 39. TCDS Type Certificate Data Sheet
- 40. TSO Technical Standard Order
- 41. VFR Visual Flight Rules
- 42. W&B Weight and Balance

6.2 Related FAA Orders and Advisory Circulars (Current Editions).

- 1. FAA Order 8110.4, Type Certification
- 2. FAA Order 8100.15, Organization Designation Authorization Procedures
- 3. FAA Order 8100.17, Field Approval Delegation Handbook
- 4. FAA Order 8110.37, Designated Engineering Representative (DER) Guidance Handbook
- 5. FAA Order 8300.16, Major Repair and Alteration Data Approval
- 6. FAA Order 8310.6, Airworthiness Compliance Check Sheets Handbook
- 7. AC 20-138, Airworthiness Approval of Positioning and Navigation Systems
- 8. AC 20-180, Approved Model List Supplemental Type Certificate (AML-STC)
- 9. AC 21-40, Guide for Obtaining a Supplemental Type Certificate
- 10. AC 23-8, Flight Test Guide for Certification of Part 23 Airplanes
- 11. AC 25.1581-1, Airplane Flight Manual
- 12. AC 43.9-1, Instructions for Completion of FAA Form 337
- 13. AC 43.13-1, Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair
- 14. AC 43.13-2, Acceptable Methods, Techniques, and Practices—Aircraft Alterations

6.3 Obtaining Copies of Referenced Documents and This AC.

6.3.1 A list of all ACs is available at <http://www.airweb.faa.gov/rgl>. Applicants can also obtain a copy of current CFRs online at <http://www.ecfr.gov>.

6.3.2 The Major Repair and Alteration Data Approval Job Aid is available at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs300/media/Major_Repair_Alteration_Job-Aid.pdf

APPENDIX A. INSTRUCTIONS FOR COMPLETING THE FIELD APPROVAL CHECKLIST

When requesting a field approval, you may use this form to provide the requested data, forms, descriptive items, and other information. You can also use an equivalent method for presenting the information and data. The standard data package (SDP) consists of (1) the checklist form, (2) its attachments, (3) Federal Aviation Administration (FAA) Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance), and (4) the data. The following instructions apply to corresponding items 1 through 12 of Form 337 as illustrated in this appendix.

Item 1—Aircraft. You can find information on the aircraft manufacturer’s identification plate to complete the Make, Model, and Serial Number blocks. The Registration Number is the same as shown on AC Form 8050-3, Certificate of Aircraft Registration - the N number. Only U.S.-registered aircraft are eligible for field approvals.

Item 2—Applicant. Enter the applicant’s name, address, and telephone number.

Item 3—Type of Product and Certification Basis. On the upper line, enter a check mark in the appropriate box to identify the item being approved. If you check “Other,” enter the product’s description in the space provided. On the bottom line, check the box that identifies how your aircraft or product was certificated. If you don’t know this information, you can find it on the Type Certificate Data Sheet (TCDS) for your aircraft or engine. On the TCDS, look in the section titled Certification Basis.

Item 4—Brief Description of Project. Using the space provided, enter a short summary of the proposed repair or alteration, such as “Installing a GPS in the instrument panel above the right yoke.” If you need additional space, attach a continuation page and note that on the form in this area.

Item 5—Schedule for Completion of Project. On the first line, enter the date you need the field approval. On the second line, enter the date you plan to start the work, and on the last line, enter the date you expect to complete the work.

Item 6—Who Will Perform the Repair or Alteration? On the top line, enter the name of the certificated mechanic who will be doing the work. If a repair station is doing the work, leave the mechanic’s name blank and enter the name of the repair station. On the second line, enter the mechanic’s airframe-and-powerplant certificate number, or if a repair station is doing the work, their certificate number.

Also enter a contact name if you are using a repair station. If the ASI doing the approval has a question and you are not available, this will make it easier for the ASI to find someone knowledgeable about the project. On the third line, give the telephone number of the mechanic or the repair station doing the work. On the bottom line, enter the location where the work will be done. This location information should be as complete as possible.

Item 7—Designees (DARs and DERs). If you are working with any Designated Engineering Representatives (DER) or Designated Airworthiness Representatives (DAR) for this project, include their names and telephone numbers, in case the ASI needs to contact them for additional information or clarification. DERs have authorization limitations - if you are working with a designee, make sure anticipated work is within the designee’s authorization.

Item 8—Compliance Statement and Compliance Checklist. Before completing the repair/alteration to your aircraft, be aware that the aircraft must still meet its certification basis after alteration/repair. Include an entry in block 8, to include proof, or data, as well as your compliance statement, that it still meets its certification basis. For example, if you want to modify the wheels of your small airplane, you would ensure the altered wheels still conform to Title 14 of the Code of Federal Regulations (14 CFR) part 23, § 23.731. The compliance checklist will list affected 14 CFR/Civil Air Regulations (CARs) and indicate how you showed compliance. The person doing the repair or alteration creates this checklist, and should address each section of the regulations applicable to the project. Appendix 2 has a sample compliance checklist format.

Item 9—Previous Alterations or Repairs that May be Affected by This Alteration. Review the aircraft’s records to determine if there are any modifications, Supplemental Type Certificates (STC), alterations, or repairs that could conflict with the proposed repair/alteration. If the prior applicant completed an FAA Form 337 for repairs/alterations that might be affected, include it. If the prior applicant made a logbook entry concerning the work done, make a copy of that entry and include it in your package. Photographs and drawings of previous alterations/repairs that might be a factor can also be very helpful.

Item 10—Maintenance Information and/or Instructions for Continued Airworthiness (ICA). In this attachment, describe how you will keep the altered/repaired part of the aircraft airworthy. This might include 100-hour or annual inspections. These should be specific instructions, including (1) inspection items, (2) minimum or maximum measurements of parts for wear or deterioration, (3) troubleshooting, (4) functional checks, (5) installation and removal procedures, and (6) servicing requirements, such as fluid change intervals or lubrication schedules. Figure 1 provides guidance and a sample checklist for creating ICAs.

Item 11—Aircraft Flight Manual Supplement (AFMS). If you have an AFMS for your alteration, include a copy of it. Guidance for creating an AFMS is available in Advisory Circular (AC) 23-8, Flight Test Guide for Certification of Part 23 Airplanes, as amended. Appendix 5 of AC 23-8 has a sample format that you can use.

Item 12—Data Attached. A list of data commonly included in the SDP is available. If the data you are attaching is included on this list, check the appropriate box. If you have data or information not included in this list, check the box labeled “Other” and enter in the space provided a short description of what you are including. Include ICAs if the aircraft has a type certificate (TC) dated after January 28, 1981.

Item 13—For All the Data Submitted. Review all data submitted and determine if the data meets the requirements listed. Check the appropriate box after review.

Item 14—FAA Use Only. Don’t write or mark in this area - it is for FAA use only.

Figure 1. Field Approval Checklist

FIELD APPROVAL CHECKLIST	
Instructions: Print or type all entries. This information should be as complete as possible prior to an initial discussion with the FAA.	
1. Aircraft	Make Click here to enter text. Model Click here to enter text.
	Registration Number Click here to enter text. Serial Number Click here to enter text.
2. Applicant	Name Click here to enter text. Address/Telephone Number Click here to enter text.
3. Type of Product and Certification Basis	
<input type="checkbox"/> Airframe <input type="checkbox"/> Engine <input type="checkbox"/> Appliance <input type="checkbox"/> Other For an appliance or "Other" list: Click here to enter text.	
Manufacturer Click here to enter text.	
Part Number Click here to enter text. Serial Number Click here to enter text.	
<input type="checkbox"/> Part 23 <input type="checkbox"/> Part 25 <input type="checkbox"/> Part 27 <input type="checkbox"/> Part 29 <input type="checkbox"/> Part 31 <input type="checkbox"/> Part 33 <input type="checkbox"/> CARs 3 <input type="checkbox"/> CARs 4(a) <input type="checkbox"/> CARs 4(b) <input type="checkbox"/> CARs 6 <input type="checkbox"/> CARs 7 <input type="checkbox"/> CARs 8 <input type="checkbox"/> CARs 13	
4. Brief Description of Project	
<input type="checkbox"/> Repair <input type="checkbox"/> Alteration Click here to enter text.	
5. Schedule for Completion of Project	
Date when field approval is needed: Click here to enter a date.	
Date when work is to begin: Click here to enter a date.	
Date for ASI visit (projected): Click here to enter a date.	
Projected completion date for project: Click here to enter a date.	
6. Who Will Perform the Repair or Alteration?	
Mechanic's name: Click here to enter text. or Repair station: Click here to enter text.	
Certificate no: Click here to enter text. Contact person at the facility: Click here to enter text.	
Telephone number: Click here to enter text.	
Location where alteration/repair will be accomplished: Click here to enter text.	

FIELD APPROVAL CHECKLIST**7. Designees (DARs, DERs, or ODAs)** None

Designated Engineering Representatives (DER), Designated Airworthiness Representatives (DAR), or Organization Designation Authorization (ODA):

Name: [Click here to enter text.](#)

Telephone number: [Click here to enter text.](#)

Name: [Click here to enter text.](#)

Telephone number: [Click here to enter text.](#)

8. Compliance Statement and Compliance Checklist

Attach the Compliance Checklist you completed.

9. Previous Repairs or Alterations Affected by This Alteration

[Click here to enter text.](#)

10. Maintenance Information and/or Instructions for Continued Airworthiness (ICA)

Maintenance information attached? Yes No

Include or reference these in block 8 of the FAA Form 337.

11. Aircraft Flight Manual Supplement (AFMS)

Do you have an AFMS? Yes No If yes, attach a copy.

12. Data Attached

- Proposed FAA Form 337
- Description of alteration, including ICA drawings, schematics, and diagrams
- Material list
- Processes
- Specifications
- Previous field approvals
- FAA Form(s) 8110-3
- Serviceable tags
- Placards
- Test data and/or flight test data
- Load analysis (electrical and/or structural)
- Other [Click here to enter text.](#)

FIELD APPROVAL CHECKLIST**13. For All the Data Submitted:**

- Are all applicable airworthiness requirements addressed? Yes No N/A
- Are all exemptions addressed? Yes No N/A
- Are all special conditions addressed? Yes No N/A
- Are the requirements of Part 26 addressed? Yes No N/A
- Are all applicable airworthiness directives addressed? Yes No N/A
- Are instructions for continued airworthiness addressed? Yes No N/A
- Are the applicable noise requirements addressed? Yes No N/A
- Are the applicable emission requirements addressed? Yes No N/A
- Are all changes to a flight manual addressed? Yes No N/A

14. FAA Use Only

- Date: _____ Click here to enter text.
- Assigned inspector: _____ Click here to enter text.
- FAA office: _____ Click here to enter text.
- Is a field approval appropriate? Yes No
- If a field approval is not performed, what is the proper method for alteration?
- Record entry STC Other Click here to enter text.
- Requires ACO concurrence? Yes No
- Requires AEG ICA review? Yes No
- Additional information required:
Click here to enter text.

APPENDIX B. INSTRUCTIONS FOR COMPLETING THE COMPLIANCE CHECKLIST

The compliance checklist documents applicable regulations and associated compliance with those regulations.

Note: At your option, you may list applicable regulatory requirements for which you still need to present substantiation data.

Instructions for completing this sample compliance checklist are as follows:

1. Title 14 of the Code of Federal Regulations (14 CFR) Part/Civil Air Regulations (CARs) Paragraph. You may list specific regulations by number, such as 14 CFR part 23, § 23.1353.

2. Subject. You should list the subject or title of applicable 14 CFR part/CARs paragraphs, such as storage battery design and installation.

3. Method of Compliance. The method of compliance may include design drawings (D), analyses (A), tests (T), or other methods (O). Some compliance checklists simply list the letter corresponding to a method of compliance. Other checklists reference specific data by title or number. However you format the method of compliance, you and the ASI should agree on the format.

4. Documentation Reference. List the documentation, such as a test report number, analysis or report number that demonstrated compliance to the subject 14 CFR part or CARs paragraph.

Figure 1. Compliance Checklist Format

14 CFR Part/CARs Paragraph	Subject	Method of Compliance	Documentation Reference

Advisory Circular Feedback Form

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by contacting the Aircraft Maintenance Division (AFS-300) or the Flight Standards Directives Management Officer.

Subject: AC 43-210A, Standardized Procedures for Requesting Approval of Data for Major Repairs and Major Alterations.

Date: _____

Please check all appropriate line items:

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows:

In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: _____

Date: _____