



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: Airworthiness Compliance Checklists for Small Airplanes during Major Alterations **Date:** **AC No:** 23-XX-21
Initiated By: ACE-100 **Change:** DRAFT

1. PURPOSE.

a. This advisory circular (AC) provides guidance material for the creation and use of airworthiness compliance checklists for small airplanes that can be used when making major alterations to small airplanes. These checklists are to be used by Airframe and Powerplant (A&P) mechanics with Inspection Authorization (IA) and by Federal Aviation Administration (FAA) Airworthiness Safety Inspectors (ASIs). The checklists will help identify all the data requirements and outline the data approval methods for a particular major alteration as well as identify the documentation required to support approval for return to service after aircraft alteration.

b. Use of these compliance checklists should be limited to alterations that have been determined to be “major” alterations, as defined in 14 CFR, part 1, but which are not so complex that they require a Supplemental Type Certificate (STC), per FAA Order 8300.10, as amended.

c. Material in this AC is neither mandatory nor regulatory in nature and does not constitute a regulation. The use of these checklists during the return to service of a major alteration is not mandatory nor does it alter any previously acceptable method.

2. BACKGROUND.

a. The data and documentation requirements for major alterations can vary considerably. This variation can be attributed to the following:

- Differing complexity of the alterations
- Different sources of data submitted

- Uncertainty of what data is actually required to show compliance with the applicable regulation during the submission to the FAA.

b. Standardization of particular airplane alterations data submission and process shall be assured through the use of compliance checklists. The FAA will establish a library of checklists that will be periodically updated. This will eliminate the need to generate individual data package requirements when a modifier has performed a modification on a similar aircraft. For example, consider a change to a part number on the landing gear legs of your Cessna 172. You can access the library to see if a checklist exists for the same change. If so, you use that checklist as a template for the creation of your checklist. Each checklist identifies the pertinent regulation as the certification basis of the airplane for the alteration. It also lists the manner in which the data can be approved.

c. This AC continues our commitment to improve the effectiveness and efficiency of the approval process for major alterations by establishing an understanding of the needs and expectations of all parties in the approval process. Reducing the approval process time requires up front involvement between the FAA and the applicant in project planning, open and constructive communication, and safety-focused project management. Using a compliance checklist should result in a more effective use of FAA and industry resources by establishing standard data and documentation requirements.

3. APPLICABILITY. This AC applies to airplane modifiers who use these airworthiness compliance checklists. These checklists are limited to use on small airplanes that have a maximum gross weight of 12,500 pounds or less. Any further limitations on applicability are prescribed in the limitations section of each checklist. The individual checklist limitations section may have applicability restrictions and limitations that are necessary to do the specific alteration. Some possible examples would include: airplanes that weigh 6,000 pounds or less; non-pressurized airplanes only; or single, non-turbocharged engine only airplanes; airplanes that are to be operated in Visual Flight Rules (VFR) conditions only; or airplanes manufactured prior to a certain date. The specific applicability determination depends on the nature of the major alteration and its affect on the aircraft to remain in compliance with 14 CFR, part 23.

4. RELATED PUBLICATIONS.

a. Federal Regulations

CAR 3, Part 3 of the Civil Air Regulations as amended through March 25, 1964

CAR 4, Part 4 of the Civil Air Regulations as amended through March 25, 1964

Code of Federal Regulations (CFR), Title 14, Part 21 – Certification Procedures for Products and Parts

b. Orders

FAA Order 8110.37C, Designated Engineering Representative (DER) Guidance Handbook, dated 9/30/98

FAA Order 8110.45, Use of Data Approved by Designated Engineering Representatives to Support Major Alterations, dated 8/30/02

FAA Order 8300.10, Change 16, Perform Field Approval of Major Repairs and Major Alterations, as amended

Code of Federal Regulations, Title 14, Part 23 – Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes

c. ACs

AC 20-138A, Airworthiness Approval of Global Navigation Satellite System (GNSS) Equipment, dated 12/22/03

AC 43.13-1B CHG 1, Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair, dated 9/27/01

AC 43.13-2A, Acceptable Methods, Techniques, and Practices – Aircraft Alteration, dated 1/1/77

Copies of the current publications of the Orders and ACs listed above can be obtained from the following address: U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785 or may be downloaded from the internet from the FAA's Regulatory and Guidance Library (RGL) at <http://www.airweb.faa.gov/ac>

5. DEFINITIONS.

Approval for Return to Service - The approval given by an appropriately rated person that enables an aircraft to be returned to service following alterations.

Existing Certification Basis – The Type Certification Basis is the applicable rules and any additional requirements that the applicant must show and use, and what the FAA must find compliant in order to grant a type certificate.

Field Approval – One of the means the FAA uses to approve technical data used to accomplish a major alteration. It is approval, by the Administrator, through an authorized Aviation Safety Inspector (ASI) (airworthiness), of technical data and/or installations used to accomplish a major alteration. Technical data so approved becomes “technical data approved by the Administrator.”

FAA Form 337 – An FAA form used to record a major repair or major alteration that becomes part of the maintenance record.

Major Repair – A repair that, if done improperly, might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness. A repair that is not completed according to accepted practices or cannot be made by elementary operations.

Major Alteration – An alteration not listed in the aircraft, aircraft engine, or propeller specification. An alteration that might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness, or an alteration that is not completed according to accepted practices or cannot be made by elementary operations, is considered a major alteration.

Designated Engineering Representative (DER) – An FAA designated engineer who has been delegated a specific engineering discipline in which he can approve engineering data on behalf of the FAA.

Instructions for Continued Airworthiness (ICA) - The documentation that provides instruction on the maintenance of the airplane, engine, or propeller.

6. DOCUMENTS REQUIRED FOR COMPLIANCE.

The applicant should submit the following to their local Flight Standards District Office (FSDO):

- Completed FAA Form 337
- Completed airworthiness compliance checklist
- Data stipulated on the particular airworthiness compliance checklist
- Necessary ICAs

Individual airworthiness compliance checklists will have different data requirements. Some may require FAA Aircraft Certification Office (ACO) coordination for approval. This requirement depends on the alteration and will be discussed on the checklist. Simple major alterations may not benefit from the use of a checklist. This AC is not meant to imply that the use of these checklists are mandatory or impose the use of checklists in all cases, but it is meant to encourage their use when deemed valuable.

7. GENERAL OVERVIEW.

a. The use of these compliance checklists should be limited to alterations that have been determined to be “major” alterations, as defined in 14 CFR, part 1, but are not so complex that they require an amended Type Certificate (TC) or STC per FAA Order 8300.10, as amended. Alterations that are classified as “minor” under 14 CFR, part 1, do not require an FAA Form 337 or the use of a checklist. The first step in considering using these compliance checklists is making the determination that the alteration is classified as a major alteration that does not require an STC.

b. The next step is to determine the aircraft's certification basis, which will provide the amendment level of 14 CFR, part 23 (or predecessor). The alteration must show compliance to all applicable rules at that amendment level. The certification basis of the airplane is found on the airplane's Type Certificate Data Sheet (TDCS). The TDCS is airplane, model number and serial number controlled. You must know these three items. The TCDS can be found online at <http://www.airweb.faa.gov/rgl>. You need the certification basis to complete the checklist form in the correct manner. The major alteration may be completed to a certification basis greater than the existing.

c. The next step is to determine what data is required for the FAA to approve the major alteration. This is Block 8 information on FAA Form 337. All data required in the summation must be “approved” data. A DER, FSDO ASI, or an ACO engineer can approve data. Consideration is required because the types data and the “approval” methods of this data determine how the checklist is completed. This analysis and the flexibility of data approval methods depicted on the checklist really illustrate the value in using these checklists during the

job planning stages. For example, you may determine several compliance requirements for the installation of some piece of electrical equipment, structural, wire installation, electrical load analysis or antenna installation. You may possess approved data for the installation from the manufacturer, use AC 43.13 2A as acceptable data for the wire selection, and use a DER to complete the approved data for electrical loads analysis. The checklist defines the data package and illustrates all items to be contained in the data package.

d. One of the methods of obtaining approved data on a particular alteration is to utilize a DER to provided necessary approved data. This ability is outlined in FAA Order 8110.45, “Use of Data Approved by Designated Engineering Representatives to Support Major Alteration,” dated 8/30/02; and Order 8110.37C, “Designated Engineering Representative (DER) Guidance Handbook,” dated 9/30/98. Both orders can be found at the FAA website www.faa.gov. When you identify a requirement for data during an alteration, you may contact a DER with the authority, as listed in Order 8110.37C, to generate the report and submit approved data. The use of a DER to develop FAA approved data can save time because it is an efficient means to complete a package. When contacting a DER, only DERs specifically authorized by their managing ACO may approve data for major repairs and alterations.

e. If you use a DER(s) to generate approved data, you may receive feedback from the DER(s) regarding additional data requirements. For example, if you have contracted for an electrical DER to accomplish an electrical loads analysis, and he or she notices the need for and recommends a structural review of the equipment installation, you may take that recommendation and include it as an additional checklist requirement.

8. HOW TO USE AND CREATE.

This section describes how to use, and provides instructions for completing, each section of the airworthiness compliance checklist. Each checklist lists the pertinent regulation at the existing certification basis of the airplane for the alteration. It also shows the manner in which the data can be approved.

Each checklist is formatted with the same paragraphs with information specific to the particular major alteration and with data specifically pertinent to that individual checklist. A discussion regarding each paragraph of a typical checklist found in the appendices is as follows:

a. **Paragraph a of Checklist.** The first page of each checklist is the table, which provides a means to show compliance to the applicable regulations associated with the major alteration to be accomplished. The compliance table contains the following:

(1) **Title Block.** The title has a brief description of the major alteration to be accomplished. The title block contains the aircraft information: Make, Model, and Serial Number blocks will be found on the aircraft manufacturers identification plate. The Registration Number is the same as shown on FAA Form 8050-3, Certificate of Aircraft Registration (N number). The title block also contains the Statement of Applicability to be signed by the IA and reads “I have determined the planned alteration to be in compliance with paragraph c, “checklist applicability.” The intent is to have the IA evaluate the aircraft and proposed

alteration to determine if the use of the checklist is appropriate. The IA accomplishes this by evaluating the applicability requirements defined in paragraph c of the checklist.

(2) The Body Of The Compliance Table. The table outlines the applicable regulations, which need to be complied with, and the methods of compliance. The table contains eleven columns. The first four columns are used to show methods of compliance and completeness of compliance for the required line item as follows:

(a) Column 1 is titled “Item Completed Initials.” This column is used primarily by the applicant for initialing the completeness of that particular line item. When column 1 is completed and all the line items are initialed, the checklist is complete.

(b) Columns 2, 3 and 4, “Planned FAA Approval Method” are used to indicate the data approval method. These columns are used during the planning stages of the alteration. The applicant will make selections for a planned data approval method for each line item in the table by checking the box in column 2, or 3, or by writing descriptions of data in column 4. Column 2 is labeled “DER, 8110-3.” The box in this column will be selected, if for that line item compliance will be documented on an FAA Form 8110-3 from a DER. Column 3 is labeled “AFS/ASI, 337 Block 3.” The box in column 3 will be selected if it is intended that the ASI will approve the data in this line item. This is commonly accomplished by coordination between the applicant and the ASI during planning stages. If the column 3 box is selected, Block 3 of FAA Form 337 must be completed and signed by the ASI. Column 4 is titled “Other.” This column will be used when data approval is to be accomplished by means other than the use of an FAA Form 8110-3 with DERs signatures or by having the IA approve the data by signing Block 3 of the FAA Form 337. When using this column, write-in the intended approval method. Some typical examples would include using a specified chapter and section of AC 43.13 1B, STCs, or approved structural repair manuals.

(c) Column 5 is titled “Subject Evaluated.” This column contains a brief description of the engineering subject matter, which requires approved data to show compliance to the regulatory requirement of that particular line item.

(d) Columns 6 and 7 are titled “Applicable Regulation (CFR or CAR).” Each of these columns lists the applicable 14 CFR or CAR requirement that is associated with the Certification Basis of the airplane to find compliance for that particular line item. The determination of which column to select between “14 CFR” and “CAR” is the certification basis date for the airplane. For example, if the aircraft had a certification date prior to 1966 (the initial date for part 23), you would select the CAR column. The amendment level of part 23 at which each sub part was amended is listed next to the part. The requirement is to show compliance to the appropriate amendment for the existing certification basis of your airplane. For example, if your airplane's certification basis is 14 CFR, part 23, amendment 37, and the checklists identify a line item “14 CFR, part 23, § 23.301, N, 28,42,48” you are required to show compliance to 14 CFR, part 23, § 23.301, as written in amendment 28. Amendments 42 and 48, which may be more stringent are not applicable to your aircraft when using this checklist. In this example, you would circle the “28” and show compliance by using column 2-4, as required.

(e) Column 8 is titled “Items to Consider or Intent of the regulation.” This column contains examples of the items to be considered to gain regulatory compliance of the particular line item.

(f) Column 9 is titled “DER Authority.” This column contains the specific DER authority requirements necessary for a DER to accomplish the FAA Form 8110-3 requirements for the particular line item. These requirements are outlined in Order 8110.37, as amended. It is possible for a DER to have authority delegated to him or her in a different means than outlined in Order 8110.37, as amended. In this situation, such evidence can be provided in Table 2 of the checklist.

(g) Column 10 is titled, “Other Guidance.” Listed here are other sources of information, ACs or orders that may help in preparation.

b. Checklist Table. The Checklist Table is a description of checklist intent.

c. Approval, Paragraph c of Checklist. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration and the airplane incorporating it for return to service using DER data entirely approved by completing Block 7, “Approval for Return to Service,” of FAA Form 337. The FAA usage of Block 3, “For FAA Use Only,” will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c, providing that no data approval is required by AFS/ASI.

d. Airworthiness Compliance Checklist Applicability, paragraph d of checklist.

(1) This paragraph stipulates all the limitations and restrictions of the usage of the checklist. The following limitations, restrictions, and requirements are common to all checklists:

(a) Checklists do not add to or detract from any existing FAA regulations. Some installations may have additional regulatory requirements beyond those listed below. An alteration cannot override an Airworthiness Directive (AD). If an alteration affects an AD, contact the FSDO or ACO for assistance.

(b) A foreign country may require more documentation of airworthiness than a copy of the FAA Form 337 before it will license an airplane that has been altered with DER data or via the field approval method. The nature and amount of additional documentation required depends upon the terms of the bilateral agreement between the United States and the importing country. Consult the applicable bilateral agreement and comply with its terms before exporting an altered airplane. Refer any questions regarding compliance with a bilateral agreement to your local Manufacturing Inspection District Office (MIDO).

(c) Alterations must be compatible with previous alterations and the current configuration.

(d) Checklists for alterations requiring revision of the FAA approved limitations section of the Aircraft Flight Manual (AFM) or Flight Manual Supplement (FMS) require ACO coordination (reference 14 CFR, part 23, §§ 23.1581 through 23.1589).

(e) Consult with your local FSDO to resolve any questions regarding the use of this checklist.

(f) Checklists that require changes to the limitations sections of the Instructions for Continued Airworthiness, as described by 14 CFR, require ACO coordination. If this is required, you must contact the ACO responsible for the TC for the product for assistance.

(2) Other restrictions or limitations applicable to the individual alteration are stipulated. One example would be the following:

“This checklist is to be used only on the following:

- (a) Airplanes of 6,000 pounds or less maximum gross weight
- (b) Airplanes having a single, naturally aspirated reciprocating piston engine
- (c) Unpressurized airplanes”

e. Checklist Use, Paragraph e of Checklist. In this paragraph specific installation instructions, installation requirements, continued airworthiness requirements, and inspections are outlined. Discussion is provided regarding specific engineering examination requirements, installation limitations, and any ICAs required. Specific engineering support data required for the alteration is outlined in detail. Specific installation requirements, specific things to watch out for, are outlined, and any specific instructions for continued airworthiness are stipulated. For example:

(1) If adding or relocating equipment, specific installation requirements should be stipulated in this section.

(2) Appropriate operations advisory information should be included in the AFM/FMS.

NOTE 1

This checklist is not applicable to alterations requiring revision of the FAA approved limitations section of the AFM or FMS. Please contact FAA FSDO or ACO representatives for alterations requiring revision of the limitations section.

(3) Installation must comply with installation instructions and limitations from the component manufacturer.

(4) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals, Paragraph f of Checklist. This paragraph specifies the necessary approvals to complete the checklist and where on the checklist to indicate the approvals. Specific sections of the tables will be filled out by DERs, A&Ps, and/or IAs.

g. Applicable Guidance Material, Paragraph g of Checklist. This paragraph allows for additional applicable guidance material to be added to the checklist.

h. Evidence of DER Authority to Approve, Paragraph h of Checklist. This paragraph provides an opportunity for a DER to present his authority to sign and approve a particular engineering discipline that has been presented to him in a manner other than in accordance with FAA Order 8110.37.

i. Complete Checklist Process. Send a copy of the completed checklist and supporting data to the local FSDO office as an attachment to the FAA Form 337, the FSDO will forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.

9. BENEFITS. The benefits of using the airworthiness compliance checklist during return to service of specific alterations on small airplanes are numerous:

a. The data package requirements for submittal to the FAA are known.

b. A specific list of all necessary data requirements and means of obtaining FAA approval is stipulated.

c. The overall benefit to the applicant and the FAA is the standardization of requirements for a particular small airplane alteration and a more predictable, streamlined FAA approval process. The use of the airworthiness compliance checklists will eliminate the need to recreate repetitively, from scratch, a similar return to service data package.

APPENDIX 1

AIRWORTHINESS COMPLIANCE CHECKLIST #1: RELOCATION OF CIRCUIT BREAKER AND ELECTRICAL PANELS

a. I have determined the planned alteration to be in compliance with paragraph c, checklist applicability.

IA SIGNATURE _____ DATE _____
 AIRCRAFT MAKE _____ MODEL _____
 SERIAL # _____ N# _____
 CERTIFICATION BASIS DATE ON TDCS _____

TABLE 1-1. Relocation of Circuit Breaker and Electrical Panels - Checklist Qualifications for DER Data Review

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Loads	23.301 N, 28, 42, 48	3.17	<ul style="list-style-type: none"> Limit load is maximum in service. Analysis to limit load must produce no yield. 			
				Factor of Safety	23.303 N	3.17	<ul style="list-style-type: none"> Ultimate = Limit load * 1.50 (50 percent margin of safety) 			
				Strength and deformation	23.305 N, 45	3.17	<ul style="list-style-type: none"> Load test to limit is okay. Structure not deformed permanently. DO NOT TEST TO ULTIMATE conditions for flight test article. If tested to ultimate conditions, the article must be thrown out or be tested to verify integrity. 			
				Proof of Structure	23.307 N	3.17	<ul style="list-style-type: none"> Limit loads are determined by flight manual, gust and landing loads. For lack of this data, the loads from 23.561 may be used (but not required). 			
				Design and Construction, General	23.601 N	3.29	<ul style="list-style-type: none"> The suitability of each questionable design detail and part having an important bearing on safety in operations, must be established by tests. 			
				Materials and Workmanship	23.603 N, 17, 23	3.29	<ul style="list-style-type: none"> All materials must meet suitable specifications. 			
				Inspection Provisions	23.611 N, 7, 48	3.3	<ul style="list-style-type: none"> Inspection and servicing must be accomplished in an appropriate manner. Are reasonable means provided for inspection and servicing? 			
				Function and Installation	23.1301 N, 7, 14, 20	3.65	<ul style="list-style-type: none"> Additional equipment installed (per operating rules) must meet intended function. 			

Item [1] Completed Initials	Planned FAA Approval Method			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER	Other Guidance	
	Pick 1, [2]							Authority	AC	
	DER	FSDO ASI	Other					[3] (ref.	Orders	
	8110-3	337, Block 3	(AC 43.13)					8110.37	Policy	AC 43-13-1B/2A
				Electrical System Capacity	23.1351 N, 7, 14, 17, 20, 43, 49	3.636, b	<ul style="list-style-type: none"> Each electrical system must be adequate for the intended use. Electric power sources, their transmission cables, and their associated control and protective devices, must be able to furnish the required power at the proper voltage to each load circuit essential for safe operation. 			
				Circuit Protective Devices	23.1357 N, 20, 21, 49	3.69 3.691 3.692	<ul style="list-style-type: none"> A protective device for a circuit essential to flight safety may not be used to protect any other circuit. If the ability to reset a circuit breaker or replace a fuse is essential to safety in flight, that circuit breaker or fuse must be so located and identified that it can be readily reset or replaced in flight. a. For fuses identified as replaceable in flight: <ul style="list-style-type: none"> (1) There must be one spare of each rating or 50 percent spare fuses of each rating, whichever is greater, and (2) The spare fuse(s) must be readily accessible to any required pilot. 			

Appendix 1

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Electric cables and Equipment	23.1365 N, 14, 43, 49	3.693	<ul style="list-style-type: none"> • Each electric connecting cable must be of adequate capacity. • Any equipment that is associated with any electrical cable installation and that would overheat in the event of circuit overload or fault must be flame resistant. That equipment and the electrical cables must not emit dangerous quantities of toxic fumes. • Cables should meet MIL-DTL-27500 or equivalent specification. 			

[1] IA should enter initials to indicate items that have been completed. In some cases, items may be left open pending final FSDO/ASI signature in Block 3 of FAA Form 337.

[2] These findings can be made by a FSDO inspector, ACO engineer, or DER. When FSDO inspector approves an item, they must also sign Block 3 of FAA Form 337.

[3] Or other equivalent authority, as evident on this form per DER.

[4] For these specific findings, it may be common for FSDO inspectors to make these findings based solely on information provided by an IA or A&P.

b. Checklist Table. This checklist is issued for guidance purposes to help show completeness of documentation for the FAA field approval and return to service process. The checklist is intended to provide guidance information during the approval process and then returning the airplane to service. An airplane alteration is eligible to use this checklist when it has met the requirements outlined in paragraph 8 of this AC.

c. Approval. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration and the airplane incorporating it for return to service using DER data entirely approved by completing Block 7, "Approval for Return to Service," of FAA Form 337. The FAA usage of Block 3, "For FAA Use Only," will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c providing that no data approval is required by AFS/ASI.

d. Checklist Applicability. This checklist is to be used only on repairs or alterations to the following:

- Airplanes of 6,000 pounds or less maximum gross weight
- Unpressurized airplanes

e. Checklist Use. Inspect the alteration criteria and examine its supporting data to verify that they meet the following criteria:

(1) Existing circuit breaker or electrical panels are retained. They are simply moved to a new location. There are no new panels installed.

(2) Appropriate operations advisory information should be included in the AFM or FMS. If, for example, the airplane's flight manual discusses going to the circuit panel in question, ensure that a particular circuit breaker is pushed in; then, if you move the circuit breaker panel, you need to revise the FMS statements that discuss its previous location.

NOTE 1

This checklist is not applicable to alterations requiring revision of the FAA approved limitations section of the AFM or FMS. Please contact FSDO or Aircraft ACO representatives for alterations requiring revision of the limitations section. However, in accordance with 14 CFR, part 23, § 23.1581 (b)(2)(ii), operational advisory information, as prescribed in §§ 23.1585 through 23.1589, may be inserted into the AFM or FMS in a manner acceptable to the Administrator. The FAA has determined that, for alterations within the scope described on this checklist, operational advisory information can be inserted into the AFM or FMS if it is determined to be acceptable by the IA. The IAs finding should include consideration of

information provided by applicable equipment manufacturers, if available.

(3) The circuit breaker panel or electrical panel must be as readily accessible and visible to the pilot in its new location as it was in its previous location. It should comply with 14 CFR, part 23, § 23.1357; CAR, § 3.691.

(4) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals.

(1) All initials must be complete in column one, with “Planned FAA Approval Method” selected in column 2-4.

(2) If column 3 is selected on any item, Block 3 of the FAA Form 337 must be signed by the ASI.

(3) An ACO engineer or FSDO inspector may sign in place of any DER signature on any data approval.

g. Applicable Guidance Material.

h. Evidence of DER Authority to Approve.

i. Complete Checklist Process. Send a copy of the completed checklist and reporting data to the local FSDO office which will, in turn, forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma, for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.

AIRWORTHINESS COMPLIANCE CHECKLIST #2: INSTALLATION OF APPROVED BELT DRIVEN GENERATORS AND ALTERNATORS

- a. I have determined the planned alteration to be in compliance with paragraph c, checklist applicability.

IA SIGNATURE _____ DATE _____

AIRCRAFT MAKE _____ MODEL _____

SERIAL # N# _____

CERTIFICATION BASIS DATE ON TDCS _____

TABLE 2-1. Installation of Approved Belt Driven Generators and Alternators - Checklist Qualifications for DER Data Review

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Design and Construction, General	23.601 N	3.291	<ul style="list-style-type: none"> Determine suitability of each component on safety of essential systems. Alternator type, belt type etc., must be suitable for the aircraft and its intended operation. 			
				Materials and Workmanship	23.603 N, 17, 23	3.292	<ul style="list-style-type: none"> All materials must meet suitable specifications. 			
				Inspection Provisions [4]	23.611 N, 7, 48	3.296	<ul style="list-style-type: none"> Inspection and servicing must be accomplished in an appropriate manner. Are reasonable means provided for inspection and servicing? 			
				Powerplant Accessories	23.1153 N, 14, 29, 34, 42	3.635	<ul style="list-style-type: none"> Approved for mounting. Use provisions for mounting. Electrical sparking contact with flammable fluids or vapors mist minimized. Continued rotation during a malfunction, if hazardous, must have a means to prevent rotation without interfering with the continued operation of the engine. 			
				Function and Installation	23.1301 N, 7, 14, 20	3.651	<ul style="list-style-type: none"> Additional equipment installed (per operating rules) must meet intended function. 			
				Hazard Assessments	23.1309 14, 17, 41. 49	3.652, 3.681	<ul style="list-style-type: none"> May not interfere with operation of equipment essential to safe operation, or other equipment. unless there is a means to inform pilot. 			

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Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
							<ul style="list-style-type: none"> • Must be designed to minimize hazard to the airplane in the event of a probable malfunction. • Examine electrical system, charging, and distribution separately and in relation to other systems, warning, engine instruments, etc. • All equipment determined as essential must be taken into account in the load analysis. • Must be labeled as to identity, function, operation, operational limits, or any combination thereof. 			
				Warning Lights	23.1322 17, 43		AMBER: Caution lights (lights indicating the possible need for future corrective action.)			
				System Reverse Current Cutout	23.1351 N, 7, 14, 17, 20, 34	3.690, 3.693 3.687	<ul style="list-style-type: none"> • Alternator and associated transmission cable must be rated for the loads applied to the electrical system in probable combinations and durations. • Reverse current cutout will not allow the battery to drain if alternator fails. 		Loads analysis, AC or MIL spec, or may apply all equipment and current from alternator.	
				Circuit Protective Devices	23.1357 N, 20, 43	3.690, 3.691	<ul style="list-style-type: none"> • If fused, must carry a spare fuse. • Must be locatable and identifiable in flight for reset or replacement. 			

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Master Switch	23.1361 N, 20, 43, 49	3.688, 3.689	<ul style="list-style-type: none"> • Master switch arrangement shall be provided that will disconnect all sources of electrical power from the main distribution system at a point adjacent to the power sources. • Master switch will be easily discernable. 			
				Switches	23.1367 N	3.694	<ul style="list-style-type: none"> • All switches must be capable of handling the required current. • Constructed with enough distance or insulating material between parts and housing so that vibration is not a problem. 			
							<ul style="list-style-type: none"> • Accessible to appropriate flight crewmembers. • Labeled as to operation and the circuit controlled. 			
				Instruction for Continued Airworthiness	23.1529 N		<ul style="list-style-type: none"> • Must include procedures for removal and installation from aircraft (i.e., exploded view, wiring diagrams, etc.). • Special tools required. • Encouraged to include required inspection interval. • May include repair of equipment component if not on replace as required basis. Equipment OEM manuals are encouraged but not acceptable alone. 			

[1] IA should enter initials to indicate items that have been completed. In some cases, items may be left open pending final FSDO/ASI signature in Block 3 of FAA Form 337.

[2] These findings can be made by a FSDO inspector, ACO engineer, or DER. When FSDO inspector approves an item, they must also sign Block 3 of FAA Form 337.

[3] Or other equivalent authority, as evident on this form per DER.

[4] For these specific findings, it may be common for FSDO inspectors to make these findings based solely on information provided by an IA or A&P.

TABLE 2-2. Comparison for Applicability Issues

	Aircraft Alternator/Generator	Installed Alternator/Generator
Weight		
C.G.		
Installation Operational RPM		
Heat Disposition Capacity		
Rotation Direction		
Noise Filter Amperage Rating		
Band Pass Filter Amperage Rating		
Safety Lock Wire or Bend over Tabs on Component		
Belt and Pulley Alignment		
Key or Keyway		
Belt Size/Type		
Noise Filter Rating		

[1] When installing larger capacity alternator, the following items may need to be addressed:

- Larger belts are often required.
- Alternator cooling air may not be sufficient.
- Master electrical system breakers may need replacing.
- Charging current wires may need replacing.
- Battery charging cables may need replacing.

[2] If the new alternator has an internal voltage regulator and the original did not, an additional electrical systems investigation will most likely have to be performed. Contact an electrical system DER.

b. Checklist Table. This checklist is issued for guidance purposes to help show completeness of documentation for the FAA field approval and return to service process. The checklist is intended to provide guidance information during the approval process and then returning the airplane to service. An airplane alteration is eligible to use this checklist when it has met the requirements outlined in paragraph 8 of this AC.

c. Approval. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration return to service using DER data entirely approved by completing Block 7, "Approval for Return to Service," of FAA Form 337. The FAA usage of Block 3, "For FAA Use Only," will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c, providing that no data approval is required by AFS/ASI. Should an IA have any questions about the applicability or use of this checklist, they are encouraged to consult with their local FSDO.

d. Checklist Applicability. This alteration must be in compliance with paragraph 8 of this AC, which outlines all the limitations, restrictions and requirements that are applicable to all checklists. This checklist is to be used only on alterations to the following:

- Airplanes of 6,000 pounds or less maximum gross weight
- Airplanes having a single, naturally aspirated reciprocating piston engine
- Unpressurized airplanes
- Belt driven installations of alternator or generator only.

e. Checklist Use. Inspect the alteration and examine its supporting data to verify that they meet the following criteria:

(1) The FAA Form 337 must include engineering analysis to support applicability of installation to aircraft application. Such engineering analysis should include weight, installation, operational Revolutions Per Minute (RPM), heat dissipation compatibility, amperage output compatibility and operational rotation direction compatibility.

(2) If the new alternator or generator replaces an existing alternator or generator, utilize Table 2-2 for applicability issues.

(3) Appropriate operational advisory information should be included in the AFM or FMS.

NOTE 1

As indicated above, this checklist is not applicable to alterations requiring revision of the FAA approved limitations section of the AFM or FMS. Please contact FSDO or Aircraft ACO representatives for alterations requiring revision of the limitations section. However, in accordance with 14 CFR, part 23, § 23.1581 (b)(2)(ii),

operational advisory information, as prescribed in §§ 23.1585 through 23.1589, may be inserted into the AFM or FMS in a manner acceptable to the Administrator. The FAA has determined that, for alterations within the scope described on this checklist, operational advisory information can be inserted into the AFM or FMS if it is determined to be acceptable by the IA. (AC 23-8A gives guidance on this). Their finding should include consideration of information provided by applicable equipment manufacturers, if available.

(4) Many aircraft installations have noise filters installed on the aircraft firewall or firewall area. These filters have amperage ratings that should not be exceeded by the amperage increases of newly installed generators or alternators.

(5) When installing generators or alternators with increased amperage output from original, use the drive belt of the smaller original unit. This will maintain the original failure mode characteristics of the original installation.

(6) Installation must comply with installation instructions and limitations of component manufacture and aircraft standards.

(7) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals.

(1) All initials must be complete in column one, with “Planned FAA Approval Method” selected in column 2-4.

(2) If column 3 is selected on any item, Block 3 of the FAA Form 337 must be signed by an ASI.

(3) An ACO engineer or FSDO inspector may sign in place of any DER signature on any data approval.

g. Applicable Guidance Material.

h. Evidence of DER Authority to Approve.

i. Complete Checklist Process. Send a copy of the completed checklist and reporting data to the local FSDO office, which will, in turn, forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma, for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.

AIRWORTHINESS COMPLIANCE CHECKLIST #3: ALTERNATE FUEL AND OIL LINE FABRICATION AND INSTALLATION

a. I have determined the planned alteration to be in compliance with paragraph c, checklist applicability.

IA SIGNATURE _____ DATE _____

AIRCRAFT MAKE _____ MODEL _____

SERIAL # N# _____

CERTIFICATION BASIS DATE ON TDCS _____

TABLE 3-1. Alternate Fuel and Oil Lines - Checklist Qualifications for Approved Data Review

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Loads	23.301 N, 28, 42, 48	3.171	<ul style="list-style-type: none"> • Limit load is maximum in service. • Analysis to LIM must produce no yield. • Weight for test = bracket structure + associated hoses + oil in hoses. 			
				Factor of Safety	23.303 N	3.172	<ul style="list-style-type: none"> • Ultimate = Limit load * 1.50 (50 percent margin of safety). 			
				Strength and Deformation	23.305 N, 45	3.173	<ul style="list-style-type: none"> • LIM with no yield. • ULT with no failure. 			
				Proof of Structure	23.307 N	3.174	<ul style="list-style-type: none"> • Limit loads are determined by flight (man. and gust) and landing loads. For lack of this data the loads from 23.561 may be used but not required. 			
				Materials and Workmanship	23.603 N	3.292	<ul style="list-style-type: none"> • All materials must meet approved specifications. • Hoses in fire area per TSO-C53a, type C/D. • All non-standard aircraft hardware to be substantiated. • Baffle material to withstand engine heat (i.e.,silicone impregnated fiberglass). • Grommets, firewall bulkhead fittings, etc. 			
				Inspection Provisions	23.611 N, 7, 48	3.296	<ul style="list-style-type: none"> • Inspection and servicing must be accomplished in an appropriate manner. 			
				Fuel Flow	23.955 N, 7, 43, 51	3.433	<ul style="list-style-type: none"> • Use hose of equal or greater size. 			

Appendix 1

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Fuel System Lines and Fittings	23.993 N, 43	3.55	<ul style="list-style-type: none"> • Support line so that no excessive vibration occurs. • Provisions for flexibility for relative motion. • Limitations of flexible hose. 			
				Fuel System Components	23.994 7, 29	3.172	<ul style="list-style-type: none"> • Protect hoses from wheels up landing. 			
				Strength and Deformation	23.305 N, 45	3.173	<ul style="list-style-type: none"> • LIM with no yield. • ULT with no failure. 			
				Fuel System Drains	23.999 N, 17, 43	3.174	<ul style="list-style-type: none"> • Do not create new "low spots." 			
				Oil System Drain	23.1017 N, 7, 14	3.57	<ul style="list-style-type: none"> • Excessive vibration. • Flow rate, install equal or larger size. • Breather lines must: <ul style="list-style-type: none"> • Not allow condensation to freeze and obstruct line. • Not constitute fire hazard from forming. • Not allow omitted oil from striking windshield. • Not discharge into induction air intake. • Not be prone to blockage by ice. 			
				Instructions for Continued Airworthiness	23.1529 8, 26		<ul style="list-style-type: none"> • See separate guidance. 			

[1] IA should enter initials to indicate items that have been completed. In some cases, items may be left open pending final FSDO/ASI signature in Block 3 of FAA Form 337.

[2] These findings can be made by a FSDO inspector or DER. When FSDO inspector approves an item, they must also sign Block 3 of FAA Form 337.

[3] Or other equivalent authority, as evident on this form per DER.

[4] For these specific findings, it may be common for FSDO inspectors to make these findings based solely on information provided by an IA or A&P.

b. Checklist Table. This checklist is issued for guidance purposes to help show completeness of documentation for the FAA field approval and return to service process. The checklist is intended to provide guidance information during the approval process and then returning the airplane to service. An airplane alteration is eligible to use this checklist when it has met the requirements outlined in paragraph 8 of this AC.

c. Approval. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration return to service using DER data entirely approved by completing Block 7, "Approval for Return to Service," of FAA Form 337. The FAA usage of Block 3, "For FAA Use Only," will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c, providing that no data approval is required by AFS/ASI. Should an IA have any questions about the applicability or use of this checklist, they are encouraged to consult with their local FSDO.

d. Checklist Applicability. This alteration must be in compliance with paragraph 8 of this AC, which outlines all the limitations, restrictions and requirements that are applicable to all checklists. This checklist is to be used only on or alterations to the following:

- Airplanes of 12,500 pounds or less maximum gross weight

e. Checklist Use. Inspect the alteration and examine its supporting data to verify that they meet the following criteria:

- (1) Installation must comply with installation instructions and limitations of component manufacture and aircraft standards.
- (2) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals.

- (1) All initials must be complete in column one with "Planned FAA Approval Method" selected in column 2-4.
- (2) If column 3 is selected on any item, Block 3 of the FAA Form 337 must be signed by the ASI.
- (3) An ACO engineer or FSDO inspector may sign in place of any DER signature on any data approval.

g. Applicable Guidance Material.

h. Evidence of DER Authority to Approve.

i. Complete Checklist Process. Send a copy of the completed checklist and reporting data to the local FSDO office, which will, in turn, forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma, for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.

AIRWORTHINESS COMPLIANCE CHECKLIST #4: RELOCATION OF AIRPLANE STORAGE BATTERIES

a. I have determined the planned alteration to be in compliance with paragraph c, checklist applicability.

IA SIGNATURE _____ DATE _____

AIRCRAFT MAKE _____ MODEL _____

SERIAL # N# _____

CERTIFICATION BASIS DATE ON TDCS _____

TABLE 4-1. Relocation of Airplane Storage Batteries- Checklist Qualifications for Approved Data Review

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Loads	23.301 N, 28, 42, 48	3.171	<ul style="list-style-type: none"> • Limit load is maximum in service. • Analysis to LIM must produce no yield. 			
				Factor of Safety	23.303 N	3.172	<ul style="list-style-type: none"> • Ultimate = Limit load * 1.50 (50 percent margin of safety). 			
				Strength and Deformation	23.305 N, 45	3.173	<ul style="list-style-type: none"> • Load test to limit is okay, structure not deformed permanently. • DO NOT TEST TO ULTIMATE conditions for flight test article. If tested to ultimate conditions, the article must be thrown out or be tested to verify integrity. 			
				Proof of Structure	23.307 N	3.174	<ul style="list-style-type: none"> • Limit loads are determined by flight manual, gust, and landing loads. For lack this data, the loads from 23.561 may be used (but not required). 			
				Design and Construction, General	23.601 N	3.291	<ul style="list-style-type: none"> • The suitability of each questionable design detail and part having an important bearing on safety in operations must be established by tests. 			
				Inspection Provisions	23.611	3.296	<ul style="list-style-type: none"> • Inspection and servicing must be accomplished in an appropriate manner. 			
				Instruction for Continued Airworthiness	23.1529 N	-	<ul style="list-style-type: none"> • See separate guidance. 			

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Function and Installation	23.1301 N, 7, 14, 20	3.652	• Additional equipment installed (per operating rules) must meet intended function.			
				Electrical System Capacity	23.1351 N, 7, 14, 17, 20, 34, 43, 49		• Each electrical system must be adequate for the intended use. • Electric power sources, their transmission cables, and their associated control and pro- tective devices, must be able to furnish the required power at the proper voltage to each load circuit essential for safe operation.			
				Circuit Protective Devices	23.1357 N, 20, 21, 49	3.690 3.691 3.692	• A protective device for a circuit essential to flight safety may not be used to protect any other circuit. • If the ability to reset a circuit breaker or replace a fuse is essential to safety in flight, that circuit breaker or fuse must be so located and identified that it can be readily reset or replaced in flight. For fuses identified as replaceable in flight: (1) There must be one spare of each rating or 50 percent spare fuses of each rating, whichever is greater; and (2) The spare fuse(s) must be readily accessible to any required pilot.			

Appendix 1

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Electric Cables and Equipment	23.1365 N, 14, 43, 49	3.693	<ul style="list-style-type: none"> • Each electric connecting cable must be of adequate capacity. • Any equipment that is associated with any electrical cable installation and that would overheat in the event of circuit overload or fault must be flame resistant. That equipment and the electrical cables must not emit dangerous quantities of toxic fumes. • Cables should meet MIL-DTL-27500 or equivalent specification. 			

[1] IA should enter initials to indicate items that have been completed. In some cases, items may be left open pending final FSDO/ASI signature in Block 3 of FAA Form 337.

[2] These findings can be made by a FSDO inspector or DER. When FSDO inspector approves an item, they must also sign Block 3 of FAA Form 337.

[3] Or other equivalent authority, as evident on this form per DER.

[4] For these specific findings, it may be common for FSDO inspectors to make these findings based solely on information provided by an IA or A&P.

b. Checklist Table. This checklist is issued for guidance purposes to help show completeness of documentation for the FAA field approval and return to service process. The checklist is intended to provide guidance information during the approval process and then returning the airplane to service. An airplane alteration is eligible to use this checklist when it has met the requirements outlined in paragraph 8 of this AC.

c. Approval. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration return to service using DER data entirely approved by completing Block 7, "Approval for Return to Service," of FAA Form 337. The FAA usage of Block 3, "For FAA Use Only," will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c, providing that no data approval is required by AFS/ASI. Should an IA have any questions about the applicability or use of this checklist, they are encouraged to consult with their local FSDO.

d. Checklist Applicability. This alteration must be in compliance with paragraph 8 of this AC, which outlines all the limitations, restrictions and requirements that are applicable to all checklists. This checklist is to be used only on repairs or alterations to the following:

- Airplanes of 6,000 pounds or less maximum gross weight
- Airplanes having a single, naturally aspirated reciprocating piston engine
- Unpressurized airplanes

e. Checklist Use. Inspect the alteration and examine its supporting data to verify that they meet the following criteria:

- (1) Appropriate operational advisory information should be included in the AFM or FMS.

NOTE 1

As indicated above, this checklist is not applicable to alterations requiring revision of the FAA approved limitations section of the AFM or FMS. Please contact FSDO or Aircraft ACO representatives for alterations requiring revision of the limitations section. However, in accordance with 14 CFR, part 23, § 23.1581 (b)(2)(ii), operational advisory information, as prescribed in §§ 23.1585 through 23.1589, may be inserted into the AFM or FMS in a manner acceptable to the Administrator. The FAA has determined that, for alterations within the scope described on this checklist, operational advisory information can be inserted into the AFM or FMS if it is determined to be acceptable by the IA. (AC 23-8A gives guidance on this). Their finding should include consideration of information proved by applicable equipment manufacturers, if available.

(2) Installation must comply with installation instructions and limitations of component manufacture and aircraft standards.

(3) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals.

(1) All initials must be complete in column one, with “Planned FAA Approval Method” selected in column 2-4.

(2) If column 3 is selected on any item, Block 3 of the FAA Form 337 must be signed by the ASI.

(3) An ACO engineer or FSDO inspector may sign in place of any DER signature on any data approval.

g. Applicable Guidance Material.

h. Evidence of DER Authority to Approve.

i. Complete Checklist Process. Send a copy of the completed checklist and reporting data to the local FSDO office, which will, in turn, forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma, for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.

AIRWORTHINESS COMPLIANCE CHECKLIST #5: INSTALLATION OF TAIL WHEEL SPRINGS

a. I have determined the planned alteration to be in compliance with paragraph c, checklist applicability.

IA SIGNATURE _____ DATE _____
 AIRCRAFT MAKE _____ MODEL _____
 SERIAL # N# _____
 CERTIFICATION BASIS DATE ON TDCS _____

TABLE 5-1. Installation of Tail Wheel Springs. - Checklist Qualifications for Approved Data Review

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Loads	23.301	3.171	<ul style="list-style-type: none"> • Limit load is maximum in service. • Analysis to LIM must produce no yield. • Weight for test = bracket structure + associated hoses + oil in hoses. 			
				Factor of Safety	23.303	3.172	<ul style="list-style-type: none"> • Ultimate = Limit load * 1.50 (50 percent margin of safety). 			
				Strength and Deformation	23.305	3.173	<ul style="list-style-type: none"> • LIM with no yield. • ULT with no failure. 			
				Proof of Structure	23.307	3.174	<ul style="list-style-type: none"> • Limit loads are determined by flight manual, gust, and landing loads. For lack of this data the loads from 23.561 may be used (but not required). 			
				Materials and Workmanship	23.603	3.292	<ul style="list-style-type: none"> • All materials must meet approved specifications. • Hoses in fire area per TSO-C53a, type C/D. • All non-standard aircraft hardware to be substantiated. • Baffle material to withstand engine heat (i.e., silicone impregnated fiberglass). • Grommets, firewall bulkhead fittings, etc. 			
				Inspection Provisions	23.611	3.296	<ul style="list-style-type: none"> • Inspection and servicing must be accomplished in an appropriate manner. 			
				Supplementary Conditions for Tail Wheels	23.497		<ul style="list-style-type: none"> • Supplementary conditions for tail wheels. 			

Appendix 1

Item [1] Completed Initials	Planned FAA Approval Method Pick 1, [2]			Subject Evaluated	(14 CFR)	(CAR)	Item to Consider or Intent of the regulation	DER Authority [3] (ref. 8110.37	Other Guidance	
	DER 8110-3	FSDO ASI, 337, Block 3	Other (AC 43.13)						AC Orders Policy	AC 43-13-1B/2A
				Side Load Conditions	23.485		• Suitable design loads must be established for the tail wheel, bumper, or energy absorption device.			
				Ground Load; Unsymmetrical Loads on Multiple- Wheel Units	23.511		• Ground load; unsymmetrical loads on multiple-wheel units.			
				General	23.471		• Ground loads general.			
				Tail Down Landing Conditions	23.481		• One-wheel landing conditions.			

[1] IA should enter initials to indicate items that have been completed. In some cases, items may be left open pending final FSDO/ASI signature in Block 3 of FAA Form 337.

[2] These findings can be made by a FSDO inspector or DER. When FSDO inspector approves an item, they must also sign Block 3 of FAA Form 337.

[3] Or other equivalent authority, as evident on this form per DER.

[4] For these specific findings, it may be common for FSDO inspectors to make these findings based solely on information provided by an IA or A&P.

b. Checklist Table. This checklist is issued for guidance purposes to help show completeness of documentation for the FAA field approval and return to service process. The checklist is intended to provide guidance information during the approval process and then returning the airplane to service. An airplane alteration is eligible to use this checklist when it has met the requirements outlined in paragraph 8 of this AC.

c. Approval. Alterations meeting the scope described in paragraph c may be approved by using this checklist and completing FAA Form 337. The IA can approve this alteration return to service using DER data entirely approved by completing Block 7, "Approval for Return to Service," of FAA Form 337. The FAA usage of Block 3, "For FAA Use Only," will not be required to accomplish this checklist for alterations that fall within the scope of paragraph c, providing that no data approval is required by AFS/ASI. Should an IA have any questions about the applicability or use of this checklist, they are encouraged to consult with their local FSDO.

d. Checklist Applicability. This alteration must be in compliance with paragraph 8 of this AC, which outlines all the limitations, restrictions and requirements that are applicable to all checklists. This checklist is to be used only on alterations to the following:

- Airplanes of 12,500 pounds or less maximum gross weight

e. Checklist Use. Inspect the alteration and examine its supporting data to verify that they meet the following criteria:

- (1) Appropriate operational advisory information should be included in the AFM or FMS.

NOTE 1

As indicated above, this checklist is not applicable to alterations requiring revision of the FAA approved limitations section of the AFM or FMS. Please contact FSDO or Aircraft ACO representatives for alterations requiring revision of the limitations section. However, in accordance with 14 CFR, part 23, § 23.1581 (b)(2)(ii), operational advisory information, as prescribed in §§ 23.1585 through 23.1589, may be inserted into the AFM or FMS in a manner acceptable to the Administrator. The FAA has determined that, for alterations within the scope described on this checklist, operational advisory information can be inserted into the AFM or FMS if it is determined to be acceptable by the IA. (AC 23-8A gives guidance on this). Their finding should include consideration of information proved by applicable equipment manufacturers, if available.

- (6) Installation must comply with installation instructions and limitations of component manufacture and aircraft standards.

(7) Any additional ICAs are properly documented per 14 CFR, part 23, § 23.1529, requirements.

f. Necessary Approvals.

(1) All initials must be complete in column one, with “Planned FAA Approval Method” selected in column 2-4.

(2) If column 3 is selected on any item, Block 3 of the FAA Form 337 must be signed by the ASI.

(3) An ACO engineer or FSDO inspector may sign in place of any DER signature on any data approval.

g. Applicable Guidance Material.

h. Evidence of DER Authority to Approve.

i. Complete Checklist Process. Send a copy of the completed checklist and reporting data to the local FSDO office, which will, in turn, forward it to the FAA Aircraft Registration Branch, Oklahoma City, Oklahoma, for inclusion in the aircraft record. Submit originals to the aircraft owner or operator to be kept with the aircraft records.