U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: COMMERCIAL PARTS | **Date:** 09/29/2010 | **AC No:** 21-45
Initiated by: AIR-100 | **Change:**

1. Purpose of this Advisory Circular (AC).

a. This advisory circular (AC) explains how you can use the new provision in Title 14 of the Code of Federal Regulations (14 CFR) §§ 21.1(a)(3), 21.8, 21.9(a)(4), and 21.50(c) for commercial parts.

b. This AC is not mandatory and does not constitute a regulation. In it, we describe an acceptable means, though it is not the only means, to comply with 14 CFR §§ 21.8, 21.9(a)(4), and 21.50(c) for commercial parts. However, if you use the means described in this AC, you must follow it entirely.

2. To Whom this AC Applies.

a. We wrote this AC for design approval holders (DAHs) who wish to exercise the privileges of 14 CFR § 21.9(a)(4). This privilege is available starting April 16, 2011. If the DAH chooses to implement commercial parts, the DAH must comply with the applicable rules. For the purposes of this AC, a DAH is limited to the holders of a type certificate (TC), supplemental type certificate (STC), and parts manufacturer approval (PMA). PMA holders who obtained PMA through evidence of a license agreement are excluded from utilizing the privileges of 14 CFR § 21.9(a)(4), unless prior approval is obtained from licensor.

> **Note:** Per 14 CFR § 21.1(b)(4) a technical standard order (TSO) is a design approval. However, for the purpose of this AC, TSO authorization (TSOA) and letter of design approval (LODA) holders are excluded from utilizing the privileges of 14 CFR § 21.9(a)(4).

3. Background.

a. The classification development of commercial parts began in the early 1990's after an investigation revealed spare articles were being produced (often by suppliers to the aircraft manufacturers) without FAA production approvals. The solution was for these companies to obtain a PMA.

b. However, the PMA rules have a gap in this area, because there are many articles installed on aircraft that were not specifically designed or produced for sale and installation on type certificated products. These articles are often produced by major manufacturers (such as consumer electronics) where aviation represents a very small share of their overall business. The rule was silent on this issue and as a result many of these articles became suspected unapproved parts (SUP).

> **Note:** The term manufacturer refers to the article manufacturer that is exempt from obtaining a production approval (e.g. Sony, Pioneer, Krups) and not the DAH.

c. The new rule, 14 CFR § 21.9(a)(4) introduces commercial parts under replacement and modification articles. It explicitly deals with articles installed on aircraft that were not produced solely for aviation purposes. One example of articles that may be eligible for commercial parts designation are articles approved under AC 20-168, *Certification Guidance for Installation of Non-essential, Non-Required Aircraft Cabin Systems and Equipment*. This AC was generated in part based on the criteria published RTCA/DO-313, *Certification Guidance for Installation of Non-essential, Non-Required Aircraft Cabin Systems and Equipment*.

d. Commercial part is a designation the FAA has created under 14 CFR § 21.9(a)(4) that allows the DAH to create a list of articles that have been approved under an FAA engineering design approval.

4. Rule Changes to Cover Articles.

a. Production of replacement & modification articles, see 14 CFR § 21.9(a), specifies that if a person knows, or should know, that a replacement or modification article is reasonably likely to be installed on a type-certificated product, the article, as defined in 14 CFR § 21.1(b)(2), may not be produced unless it is:

(1) Produced under a TC;

(2) Produced under an FAA production approval;

(3) A standard part;

(4) A commercial part, per 14 CFR § 21.1(b)(3);

(5) Produced by an owner or operator for maintaining or altering that owner or operator's product; or

(6) Fabricated by an appropriately rated certificate holder with a quality system and consumed in the repair or alteration of a product in accordance with 14 CFR part 43.

b. The requirements of 14 CFR § 21.9 in conjunction with 14 CFR § 21.50 create two new provisions:

(1) A new privilege is available to DAHs to designate articles as commercial parts with concurrence from the FAA.

(2) It excludes the producer of commercial parts from FAA production approval requirements.

c. This change will allow DAHs to create and maintain the commercial parts list (CPL) for their specific products, while operators and maintainers can acquire replacement articles from any source, provided the article is found in the FAA approved CPL.

5. Definitions Reviewed.

a. Article: An article (from 14 CFR § 21.1) is defined as a material, part, component, process, or appliance.

b. Commercial Part: Commercial part is defined as an article (part, component or possibly appliance depending on appliance, but not a material or process) that was originally approved through an FAA design approval and is listed on an FAA-approved commercial parts list included in the DAH's instructions for continued airworthiness (ICA). The DAH must show, and the FAA finds, the article is acceptable to be listed as a commercial part by meeting two criteria. First, the DAH must substantiate to the FAA, in accordance with 14 CFR § 21.50(c)(2)(i), that failure of the commercial part as installed in the product, would not degrade the level of safety of the product. Therefore, the article must not be critical, required, or essential to the safe operation of the product and the commercial part can not fail in a manner that would cause damage to the product or cause injury to occupants. The second criterion is that the article is produced only under manufacturer's specifications and is marked only with the manufacturer's markings. Manufacturer in this case is the manufacturer of the article, and not the DAH. This is to imply that no production approval holder (PAH) markings should be found on the article.

c. Approved, Unapproved, Acceptable Article: We classify an article as approved, unapproved, or acceptable. See figure 1 for a graphical explanation.

(1) An *Approved* article has an approved design under 14 CFR § 21.8, is produced under an FAA-approved production system (for example, PC/production certificate or PMA), conforms to FAA-approved data, and is in a condition for safe operation. More detail can be found in FAA Order 8120.16, *Processing Reports of Suspected Unapproved Parts*.

(2) An *Unapproved* article is classified under a suspected unapproved part (SUP). A SUP is an article not meeting the requirements of an approved article. More detail can be found in AC 21-29, *Detecting and Reporting Suspected Unapproved Parts*.

(3) An *Acceptable* article has an approved design under 14 CFR § 21.8, but is not produced under an FAA-approved 14 CFR part 21 production system. An acceptable article can be a standard part, owner/operator produced article for their own maintenance, and a commercial

part. These articles are *acceptable* for installation on aircraft under 14 CFR part 43. More detail for owner/operator articles can be found in AC 20-62, *Eligibility, Quality, & Identification of Aeronautical Replacement Parts* and AC 21-29 for standard parts.

Figure 1. Article Classification

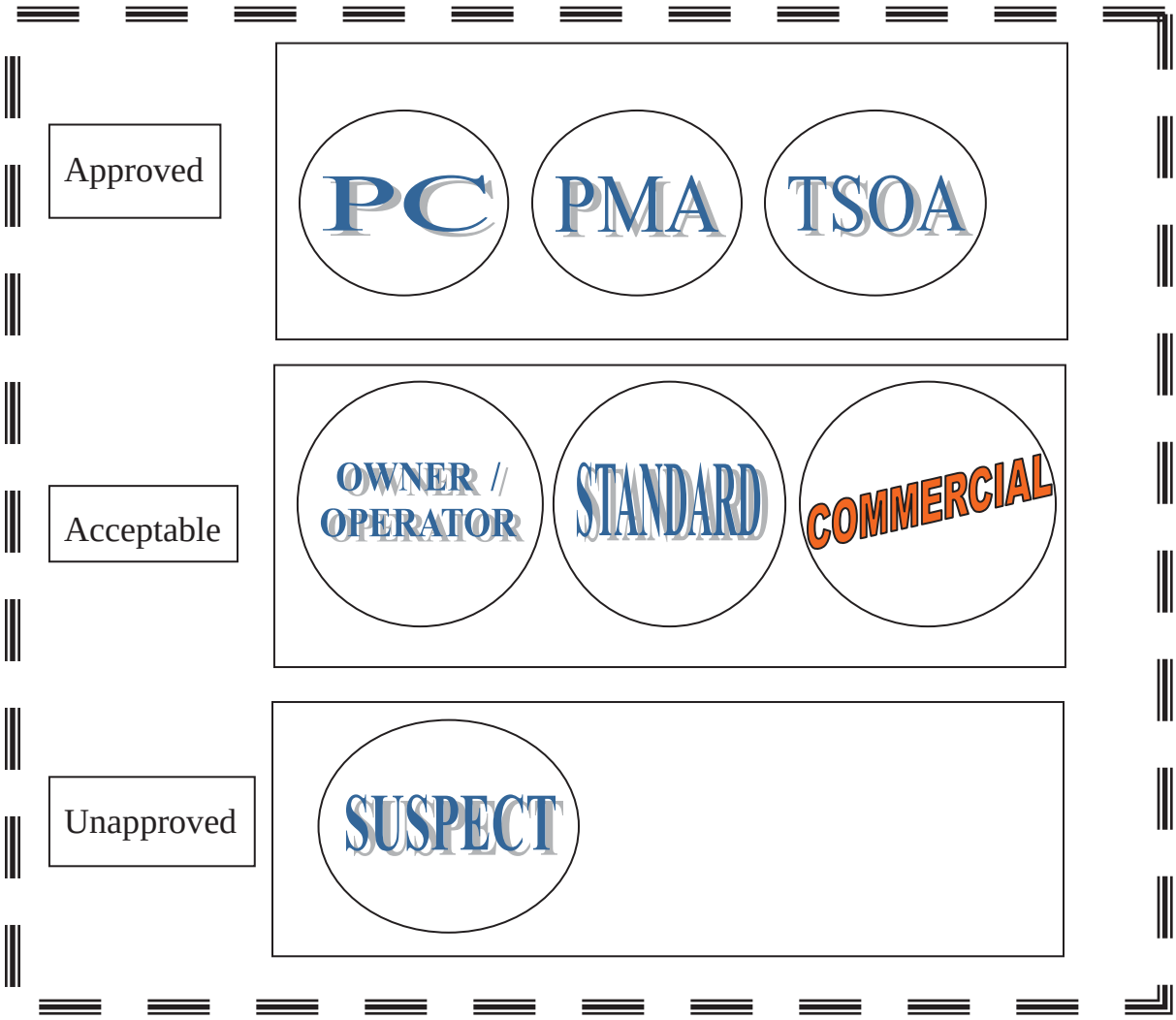


Table 1 presents a comparison of approved vs. acceptable articles and a comparison of standard vs. commercial.

Table 1. Required Approvals

CRITERIA	APPROVED ARTICLES	ACCEPTABLE ARTICLES	
		STANDARD	***COMMERCIAL***
Design Standard	DAH or Manufacturer's Design Data	Established Govt. or Industry-Accepted Spec. (SAE, MIL, etc.)	Manufacturer's Design Data
Design Approval	TC/STC, PMA, TSOA, LODA	TC/STC, PMA, TSOA, LODA	TC/STC, PMA
Production Approval	PC, PMA, TSOA	Not Required	Not Required

Note: It is important to note that the article has an approved design under TC, STC, or PMA process. The designation of commercial (or standard) excludes the producer from having to obtain an FAA production approval for the article.

6. How Will DAH Designate Commercial Parts?

a. A DAH who decides to pursue commercial parts under its design approval must determine if its article is eligible. A CPL is generated for each product type (such as Boeing 737) and series/model (-200). For PMA, if the model eligibility lists the S/N, then that information must also be reflected on a CPL. The TC/STC/PMA number is also listed at the top of the CPL. As mentioned in the definition, the commercial part will be listed on a CPL after the DAH shows, and FAA finds:

(1) The failure of the article leads to no degradation in the level of safety of the product.

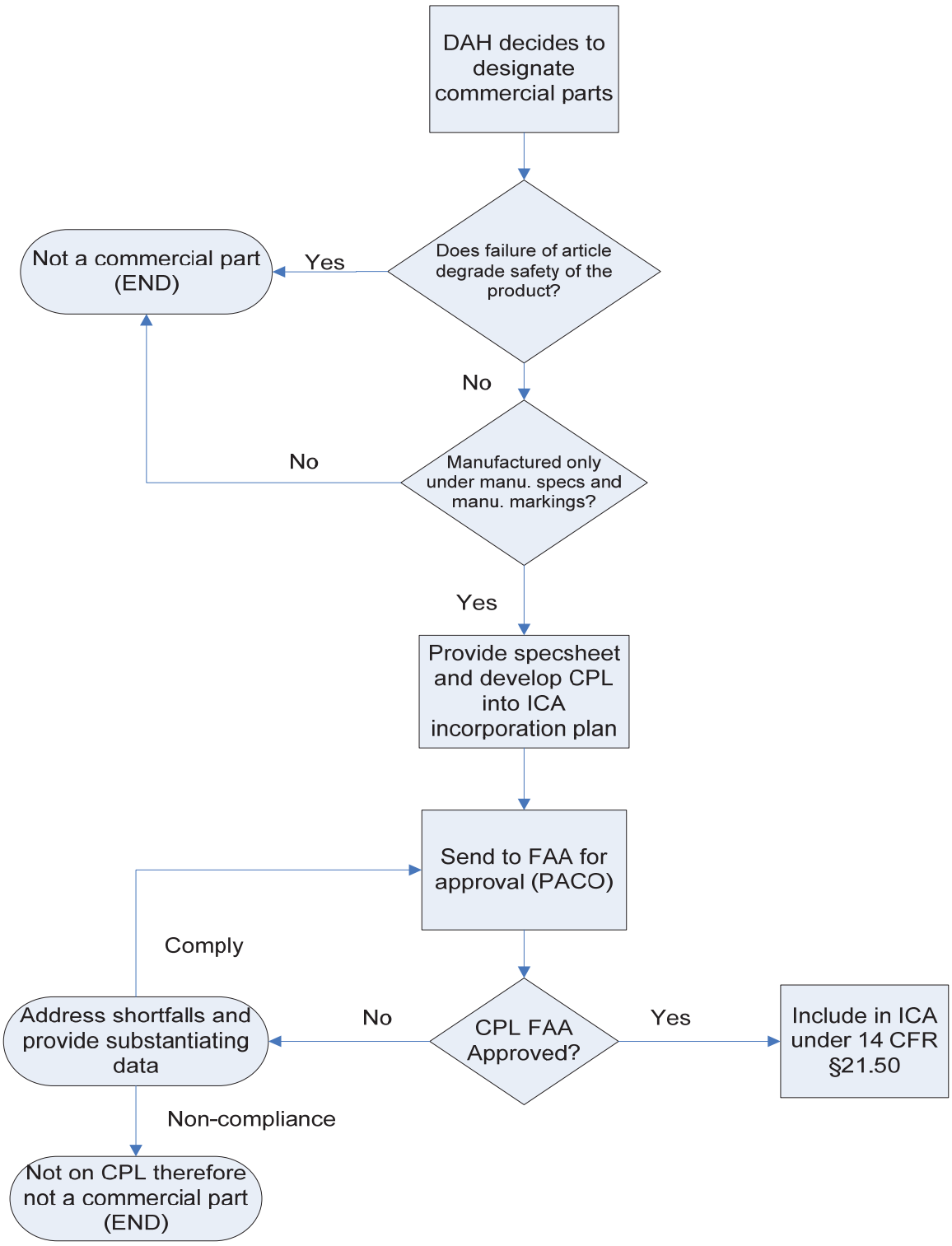
(2) The article is only manufactured under manufacturer's specifications and marked with the manufacturer's markings. No additional design, quality, marking, or production receiving inspection is required or performed by the DAH to ensure that failure of the article does not degrade the level of safety of the product.

(3) The article may be subject to further data requirements if the FAA deems it necessary.

b. The DAH will then substantiate/show, and the FAA, in this case project aircraft certification office (PACO), will determine whether the article meets the commercial part definition. A system safety assessment is necessary to show the failure of the article does not degrade safety. Failure is not just its intended function stopping, but also creating a hazard situation. An example is an electrical short not creating a fire hazard. Depending on the nature

of the commercial part (sink valve vs. cabin reading light bulb), the depth of the system safety assessment can be as simple as providing the airworthiness requirements met when initially approved under type design, or for more complex items perform a system safety assessment as instructed by AC 20-168. If the article is used in multiple locations, and is shown to be commercial part eligible for one location, but not eligible in other locations, then the article is not eligible for commercial part consideration. Once the CPL is approved by the FAA, it is considered to be part of the ICA, and must be provided to an end user in accordance with 14 CFR § 21.50. See figure 2 for a flow chart on the initial commercial parts process.

Figure 2. Initial CP Process for TC/STC and PMA Holders
Flow Diagram



7. What a DAH Should Do.

a. Determine if the article is eligible to be considered a commercial part. Use the steps in paragraph 6 and the flowchart in figure 2 to determine eligibility. If it is eligible, develop a CPL for the product. Provide a manufacturer's specification sheet as a baseline (example of DAH generated specification sheet provided in appendix B, but not all inclusive) and any other information the DAH deems necessary. An example of other information would be if a DVD player needed a metal case instead of a plastic one. If the article uses electrical power, provide a drawing or sketch of where the article is installed (not necessary for non-electrical unless asked for by FAA). Provide the CPL to the FAA and answer questions that arise. Include the CPL in the ICA. It would be helpful to the end user to identify the articles as commercial in the illustrated parts catalog (IPC) or its equivalent and to provide a copy of the latest CPL to entities such as a distributor.

b. In addition, a DAH who has an FAA approved CPL would have to establish a system that:

(1) Maintains each list of all commercial parts incorporated into each FAA approved product type, or PMA article as applicable;

(2) Furnishes the respective lists (and changes to the lists) to persons in accordance with existing 14 CFR § 21.50;

(3) Maintains current commercial parts lists to reflect design changes; and records FAA approval of both the lists and their revisions. Each CPL should have a revision record with each article stating the revision date and level. The list is recommended to be maintained by article number alphanumerically, for ease of use.

8. Preparing the CPL. A CPL is produced for each product type (such as Boeing 737) and series/model. A sample CPL is provided in appendix A. For each article included on the CPL provide the following information:

a. Article number (Part Number),

b. Article nomenclature,

c. Article manufacturer's name,

d. State whether the article uses electrical power, and

e. State whether a specification sheet is provided/available (For ease and practicality, specification sheet should be included with the CPL as part of the ICA.

9. Approval of the CPL. Submit the CPL for FAA approval to the PACO. For each article on the CPL, provide the following support data:

a. State the function of the article,

b. Provide system safety assessment,

c. Drawing or sketch of where the article is used (articles using electrical power), and

d. Dimensions and weight.

> **Note:** Once an article is listed on a CPL and approved, the article may not be removed from the CPL, unless a safety issue exists which involves the article.

10. What to expect from FAA. Through ACs and policy documents, we provide guidance to applicants for commercial parts. The FAA will determine whether a CPL meets all applicable requirements and that all articles on the CPL are commercial parts. A letter, email, or written notification will be sent to the applicant to inform whether the CPL is complete and approved (signed or stamped), rejected with reasoning, or if more data is needed.

11. How to Deal with Repairing, Replacing, and Replacement Alternative Commercial Parts.

a. Repair – Repair in accordance with the DAH's ICA.

b. Replacement – Replace in accordance with the DAH's ICA. If multiple manufacturers and article numbers are listed in the CPL for the same article, they are acceptable replacements. These articles will not have been produced under an FAA-approved production system and therefore will not be accompanied by FAA Form 8130-3, *Authorized Release Certificate*. However, the DAH may continue to accompany an 8130-3 under their own production approval if they wish to export the product.

c. Replacement Alternative – A replacement alternative may be necessary due to several factors. The main reasons are article unavailability or obsolescence. Article numbers can change or manufacturers can upgrade models every year. An example is a DVD player. A newer model may come out every year and the older model may no longer be available. An article may also be more cost effective or of a higher quality. Commercial part replacement alternative is an alteration to the aircraft. For the purposes of this AC, the major alteration process will be followed if the article involves electrical power, and will require a record in accordance with 14 CFR § 43.9 with FAA approved data. Otherwise, the replacement alternative follows minor alteration process. Data may be approved by the FAA or an appropriately authorized designated engineering representative (DER). An appropriately authorized DER in this case would be one that has the authority and area of expertise such as an electronics DER to approve only the data for interior electrical equipment.

d. The DER adheres to the same procedures an FAA employee would in making a replacement alternative finding. The DER is allowed to approve the supporting data on behalf of the FAA only for the replacement alternative finding. The DER may not approve any initial

approvals on the CPL and may not change the CPL. Use FAA Form 8110-3 with the Purpose of Data block filled in as 'In support of a major alteration for S/N XXXX under 14 CFR § 21.9(a)(4) for a replacement alternative.' The Applicable Requirements block below the Purpose of Data block should list all the relevant regulations the equipment installation has met, such as 14 CFR § 25.1365. An example is provided in appendix C. The DER should follow all applicable instructions found in FAA Order 8110.37, *Designated Engineering Representative (DER) Handbook*.

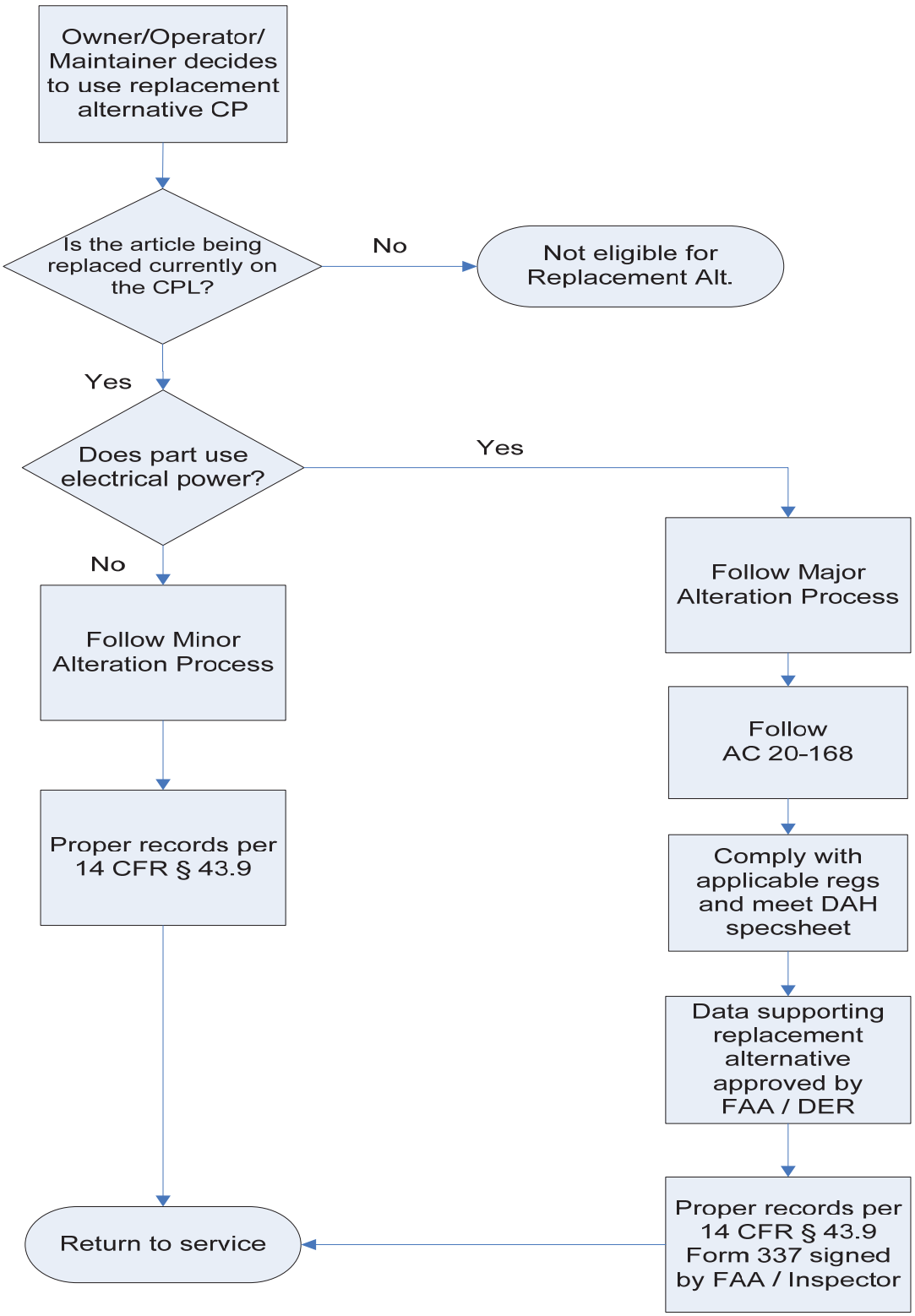
e. If one pursues replacement alternative for a commercial part, follow the flowchart in figure 3 and the following procedures:

(1) Review and determine necessary specifications the article must meet.

(2) To qualify for commercial parts replacement alternative, an article with electrical power must meet the requirements of AC 20-168. A DAH provided specification sheet may also be used as long as all the criteria of the specifications are met. If it is a non-electrical article, the article must meet specifications/requirements for the original article.

(3) All replacement alternative articles whether electrical or non-electrical must follow their applicable portions of 14 CFR § 43.9 for the installation and return to service.

Figure 3. Replacement Alternative Commercial Part Process for Operators and Maintenance Flow Diagram



12. Related References

a. FAA Order 8110.4 - Type Certification.

b. FAA Order 8110.54 – Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents.

c. FAA Order 8110.37 – Designated Engineering Representative (DER) Handbook.

d. FAA AC 21-29 – Detecting and Reporting Suspected Unapproved Parts.

e. FAA AC 20-62 – Eligibility, Quality, & Identification of Aeronautical Replacement Parts.

f. FAA AC 20-168 - Certification Guidance for Installation of Non-Essential, Non-Required Aircraft Cabin Systems & Equipment (CS&E).

g. RTCA, Inc. Document RTCA/DO-313 – Certification Guidance for Installation of Non-Essential, Non-Required Aircraft Cabin Systems & Equipment.

h. FAA Form 8130-3, Authorized Release Certificate (Airworthiness Approval Tag).

i. FAA Form 8110-3, Statement of Compliance with the Federal Aviation Regulations.

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FOR David W. Hempe
Manager, Aircraft Engineering Division
Aircraft Certification Service

Appendix A. Example of Commercial Parts List

STC # ST12345SE
COMMERCIAL PARTS LIST
Affected Aircraft Type, Boeing Model 737-300
November 18, 2011 Revision #2

Article Number	Article Nomenclature	Manufacturer Name	Electrical Power	Specification sheet
ABC1 – DIM	Light Dimmer	ACE Lighting	Yes	Yes
10203040	Cabin Reading Light Bulb	Acme Electronics	Yes	Yes
12345678	Curtain Rings	Acme Home	No	No
91827364	Bathroom Door Hinge	Acme Bath	No	Yes
98765432	Sink Valve	Acme Kitchen	No	Yes

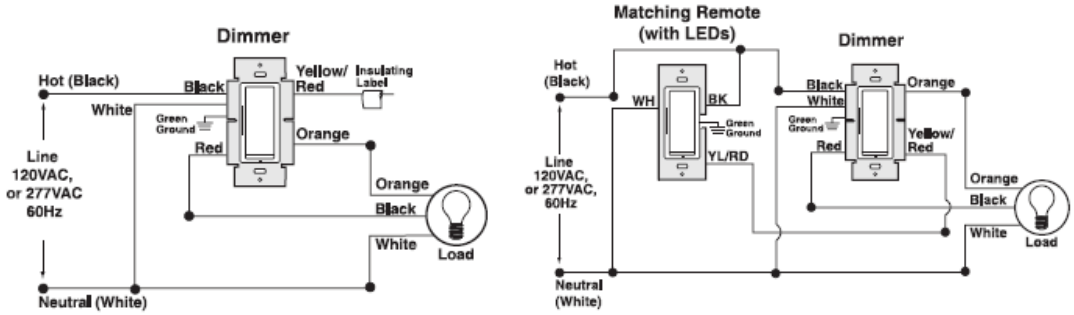
REVISION HISTORY

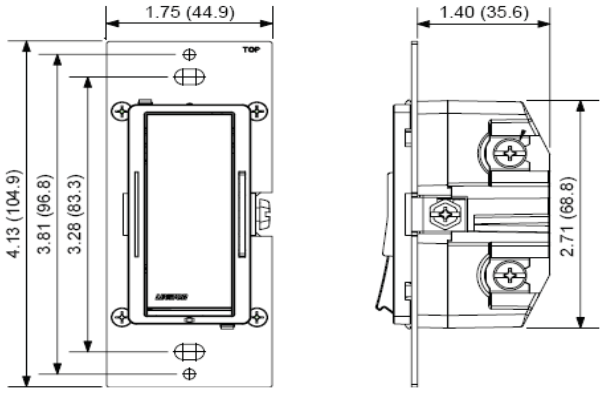
	Article Number	Revision Date	Revision Level	Comment
Article Added	91827364 10203040	October 21, 2011 November 18, 2011	(1) (1) (2)	
Article Deleted	ABC9876	October 21, 2011	(1)	No longer CP Superseded by A/D #123
Article Changed	12345678	November 18, 2011	(2)	Nomenclature changed

Appendix B. Example of Specification Sheet

ABC Commercial Grade Light Controls Specification Sheet

ACCEPTABLE MANUFACTURERS	ACE Lighting	Charlie Switches	Delta Accessories
ARTICLE NUMBER	ABC1 – DIM	XYZ2 – ON	DD3 - SLIDE
MATERIAL	Plastic	Aluminum	Plastic
RATING	600W-120VAC	400W-120VAC	600W-120VAC
STANDARDS	UL 1472 UL Listed #41307 FCC Part 15 Class B NOM-057	UL 1472 UL Listed #41307 MIL. STD 105 ANSI Z1.4	UL 1472 UL Listed #41307 IEC Level 4 Surge CSA Certified #LR-67412
DIMENSIONS	As shown in diagram	As shown in diagram	As shown in diagram
WEIGHT	1.2 Lbs	0.98 Lbs	1.3 Lbs
ADDITIONAL NOTES	Must meet Class 1AA insulation requirement	Must meet Class 1AA insulation requirement	Must meet Class 1AA insulation requirement





Appendix C. Example of FAA Form 8110-3 Statement of Compliance with the Federal Aviation Regulations Used for a Replacement Alternative Approval

U.S. DEARTICLEMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION **STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS**	DATE **November 18, 2010**

AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION

MAKE	MODEL NO.	TYPE *(Airplane, Radio, Helicopter, etc.)*	NAME OF APPLICANT
ABC (Aircraft Manufacturer)	**ABC 700-300 Aircraft**	**Airplane**	**Joe's Repair Shop**

LIST OF DATA

IDENTIFICATION	TITLE
DEF Co. **BDP-S350**	**DEF Co. Cook top replaces 123 Cook top**
XYZ Inc. **LN22A650**	**XYZ Oven replaces 789 Oven**
- - -END- - -	

PURPOSE OF DATA

In support of a major alteration for S/N 123 under 14 CFR § 21.9(a)(4) for a replacement alternative.

APPLICABLE REQUIREMENTS *(List specific sections)*

14 CFR § 25.1365 (Insert all applicable airworthiness requirements and include amendment level)

CERTIFICATION – Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Article 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered N/A have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations.

I (We) Therefore
[ ] Recommend approval of these data
[X] Approve these data

SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)	DESIGNATION NUMBER(S)	CLASSIFICATION(S)
Joe Smith	**DERT-999999-NM**	
Joe Smith		