

Airworthiness



How can you tell if an airplane is airworthy? **This may be an open ended question the DE asks you during the oral portion of your check ride.** There are several answers to this question. Let's first review the definition of airworthy. (See FAR 91.7 reproduced at the end for your convenience)

Two items become apparent. First, the pilot in command (PIC) is responsible for determining airworthiness before operating an aircraft. Second, there is an implied 'safe' condition. This generally means the aircraft has been properly inspected and maintained. Digging into the FARs a bit deeper, we will review FAR 91.409 (again, reproduced at the end for your convenience)

Reviewing the somewhat lengthy FAR 91.409 raises several items that are highlighted in red. First, there are both annual inspections and, if the aircraft is used for flight instruction, 100 hour inspections. Second, only a person that has an inspection authority (IA) can supervise and sign off an annual inspection. Any airframe and power plant (A&P) mechanic can sign off the 100 hour inspection however. Third, there are additional maintenance and inspection regulations specific to your aircraft called airworthiness directives. Airworthiness Directives are legally enforceable rules issued by the FAA in accordance with 14 CFR [part 39](#) to correct an unsafe condition in a product. 14 CFR part 39 defines a product as an aircraft, aircraft engine, propeller, or appliance.

FAA Order [8040.1](#) defines the FAA's authority and responsibility for the development and issuance of ADs. The hot links can give you further reading on Ads.

- [Responsibilities](#) (FAA, Type Certificate owner, aircraft owner/operator)
- [Applicability and Compliance](#)
- [Content & Format Guidelines](#)
- [Incorporation by Reference](#)
- [Issuance and Publication](#)

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- [Types of Airworthiness Directives](#)
- [Alternative Method of Compliance](#)

So what does this mean to you? **It means you, as PIC, need to have access to and review the aircraft's maintenance records before operating it.** The annual and 100 hour inspection will normally have a checklist that either the AP or IA has developed or obtained from a commercial service. Further, they will have a list of the ADs that are applicable to your aircraft and will have appropriate signatures for the completion of the annual or 100 hour.

But as they say in the infomercial world; “wait, that’s not all”.

What about things like avionics, instruments, ELTs, etc. ? They must also be properly maintained. Unfortunately, they have a different schedule that either a 100 hour or an annual inspection. The following are items that must be checked in the maintenance records to ensure they are current:

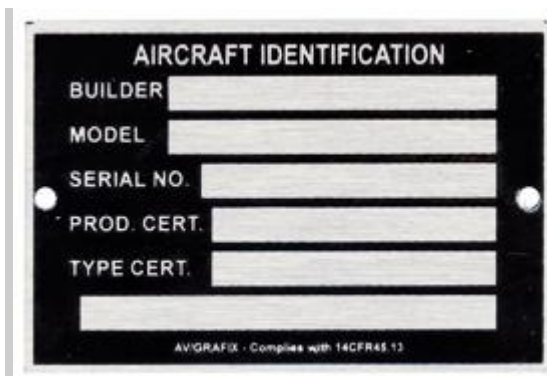
- **Altimeter (FAR 91.411) (Under IFR in controlled airspace – every 24 months)**
- **Transponder (FAR 91.413) (24 months)**
- **VOR (FAR 91.171) (Under IFR – within 30 days – may be in separate record from the maintenance logs)**
- **ELT (FAR 91.207) (every 12 months – typically tested during an annual)**
- **ELT Battery Replacement** Regulations require ELT batteries to be replaced after one hour of operation or after 50 percent of the battery's useful life. The one-hour usage requirement is cumulative--if the ELT is used two times for half an hour each, then the transmitter has been used for a cumulative total of one hour and the battery must be replaced. Battery useful life, for the purpose of battery replacement, is determined by the battery manufacturer. The date of the next required battery replacement must be marked on the ELT and in the aircraft records.

There are also documents and placards that must be affixed or in the aircraft. Two that you are probably familiar with are the airworthiness certificate and the registration certificate (see below figure).

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The one placard that is sometimes overlooked is the aircraft identification serial number tag. It is a metal tag that must be permanently affixed to the outside of the aircraft (normally in the empennage area – see below figure). It is extremely important that the serial number on this tag agree with the serial number on the registration and the airworthiness certificates. If an airplane has been salvaged or stolen it is likely this tag may have been tampered with or removed.



Finally, there is the Pilots Operating Handbook (POH) and the Weight and Balance. Both must be onboard the airplane and must agree with the aircraft serial number.

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Unfortunately not all owners and or operators are ethical. As the first cartoon implies, documents can be disguised or created that would imply the maintenance and inspections have been meticulously performed. It is your responsibility to conduct the due diligence and ask to see the above maintenance and inspection records. If anyone is hesitant about showing you their maintenance logs and records, then that should serve as a big red flag that something is amiss.

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FAR 91.7 Civil Aircraft Airworthiness

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

FAR 91.409 - Inspections

(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had—

(1) An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by §43.7 of this chapter; or

(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

No inspection performed under paragraph (b) of this section may be substituted for any inspection required by this paragraph unless it is performed by a person authorized to perform annual inspections and is entered as an “annual” inspection in the required maintenance records.

(b) Except as provided in paragraph (c) of this section, no person may operate an aircraft carrying any person (other than a crewmember) for hire, and no person may give flight instruction for hire in an aircraft which that person provides, unless within the preceding 100 hours of time in service the aircraft has received an annual or 100-hour inspection and been approved for return to service in accordance with part 43 of this chapter or has received an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter. The 100-hour limitation may be exceeded by not more than 10 hours while en route to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.

(c) Paragraphs (a) and (b) of this section do not apply to—

(1) An aircraft that carries a special flight permit, a current experimental certificate, or a light-sport or provisional airworthiness certificate;

(2) An aircraft inspected in accordance with an approved aircraft inspection program under part 125 or 135 of this chapter and so identified by the registration number in the operations specifications of the certificate holder having the approved inspection program;

(3) An aircraft subject to the requirements of paragraph (d) or (e) of this section; or

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(4) Turbine-powered rotorcraft when the operator elects to inspect that rotorcraft in accordance with paragraph (e) of this section.

(d) Progressive inspection. Each registered owner or operator of an aircraft desiring to use a progressive inspection program must submit a written request to the FAA Flight Standards district office having jurisdiction over the area in which the applicant is located, and shall provide—

(1) A certificated mechanic holding an inspection authorization, a certificated airframe repair station, or the manufacturer of the aircraft to supervise or conduct the progressive inspection;

(2) A current inspection procedures manual available and readily understandable to pilot and maintenance personnel containing, in detail—

(i) An explanation of the progressive inspection, including the continuity of inspection responsibility, the making of reports, and the keeping of records and technical reference material;

(ii) An inspection schedule, specifying the intervals in hours or days when routine and detailed inspections will be performed and including instructions for exceeding an inspection interval by not more than 10 hours while en route and for changing an inspection interval because of service experience;

(iii) Sample routine and detailed inspection forms and instructions for their use; and

(iv) Sample reports and records and instructions for their use;

(3) Enough housing and equipment for necessary disassembly and proper inspection of the aircraft; and

(4) Appropriate current technical information for the aircraft.

The frequency and detail of the progressive inspection shall provide for the complete inspection of the aircraft within each 12 calendar months and be consistent with the manufacturer's recommendations, field service experience, and the kind of operation in which the aircraft is engaged. The progressive inspection schedule must ensure that the aircraft, at all times, will be airworthy and will conform to all applicable FAA aircraft specifications, type certificate data sheets, airworthiness directives, and other approved data. If the progressive inspection is discontinued, the owner or operator shall immediately notify the local FAA Flight Standards district office, in writing, of the discontinuance. After the discontinuance, the first annual inspection under §91.409(a)(1) is due within 12 calendar months after the last complete inspection of the aircraft under the progressive inspection. The 100-hour inspection under §91.409(b) is due within 100 hours after that complete inspection. A complete inspection of the aircraft, for the purpose of determining when the annual and 100-hour inspections are due, requires a detailed inspection of the aircraft and all its components in accordance with the progressive inspection. A routine inspection of the aircraft and a detailed inspection of several components is not considered to be a complete inspection.

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(e) Large airplanes (to which part 125 is not applicable), turbojet multiengine airplanes, turbopropeller-powered multiengine airplanes, and turbine-powered rotorcraft. No person may operate a large airplane, turbojet multiengine airplane, turbopropeller-powered multiengine airplane, or turbine-powered rotorcraft unless the replacement times for life-limited parts specified in the aircraft specifications, type data sheets, or other documents approved by the Administrator are complied with and the airplane or turbine-powered rotorcraft, including the airframe, engines, propellers, rotors, appliances, survival equipment, and emergency equipment, is inspected in accordance with an inspection program selected under the provisions of paragraph (f) of this section, except that, the owner or operator of a turbine-powered rotorcraft may elect to use the inspection provisions of §91.409(a), (b), (c), or (d) in lieu of an inspection option of §91.409(f).

(f) Selection of inspection program under paragraph (e) of this section. The registered owner or operator of each airplane or turbine-powered rotorcraft described in paragraph (e) of this section must select, identify in the aircraft maintenance records, and use one of the following programs for the inspection of the aircraft:

(1) A continuous airworthiness inspection program that is part of a continuous airworthiness maintenance program currently in use by a person holding an air carrier operating certificate or an operating certificate issued under part 121 or 135 of this chapter and operating that make and model aircraft under part 121 of this chapter or operating that make and model under part 135 of this chapter and maintaining it under §135.411(a)(2) of this chapter.

(2) An approved aircraft inspection program approved under §135.419 of this chapter and currently in use by a person holding an operating certificate issued under part 135 of this chapter.

(3) A current inspection program recommended by the manufacturer.

(4) Any other inspection program established by the registered owner or operator of that airplane or turbine-powered rotorcraft and approved by the Administrator under paragraph (g) of this section. However, the Administrator may require revision of this inspection program in accordance with the provisions of §91.415.

Each operator shall include in the selected program the name and address of the person responsible for scheduling the inspections required by the program and make a copy of that program available to the person performing inspections on the aircraft and, upon request, to the Administrator.

(g) Inspection program approved under paragraph (e) of this section. Each operator of an airplane or turbine-powered rotorcraft desiring to establish or change an approved inspection program under paragraph (f)(4) of this section must submit the program for approval to the local FAA Flight Standards district office having jurisdiction over the area in which the aircraft is based. The program must be in writing and include at least the following information:

(1) Instructions and procedures for the conduct of inspections for the particular make and model airplane or turbine-powered rotorcraft, including necessary tests and checks. The instructions and procedures must set forth in detail the parts and areas of the airframe,

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engines, propellers, rotors, and appliances, including survival and emergency equipment required to be inspected.

(2) A schedule for performing the inspections that must be performed under the program expressed in terms of the time in service, calendar time, number of system operations, or any combination of these.

(h) Changes from one inspection program to another. When an operator changes from one inspection program under paragraph (f) of this section to another, the time in service, calendar times, or cycles of operation accumulated under the previous program must be applied in determining inspection due times under the new program.