



Airworthiness Requirements

General Overview

AirTest Pro

Overview

WHAT

- Airworthiness requirements are the basis for deciding whether an aircraft is worthy of safe flight. They are what must be met to ensure an aircraft is safe and therefore legal to fly.

WHY

- For an airplane to be airworthy, specific documents must be on board and current, inspections must be completed, and instruments must be functioning, otherwise the airplane is un-airworthy, or illegal to fly.

CONTENT

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 - Without an MEL
 - With an MEL
 - Required Inspections & Documents
 - Airworthiness Certificates
- Obtaining a Special Flight Permit
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- Preventive Maintenance
- Inoperative Equipment in Flight



Inoperative Equipment Before Flight

- Equipment requirements are designed for everyone's safety
 - Eliminates subjective safety decisions
- The following procedures are minimum equipment requirements to be legal to fly
 - Just because it's legal, doesn't mean it's safe
 - If you're not comfortable, don't fly
 - Set personal equipment minimums
- Methods for Determining Airworthiness
 - Without an MEL (most common)
 - With an MEL



Airworthiness

Without an MEL

- Widely used due to simplicity and minimal paperwork
- When inoperative equipment is found prior to flight, decide whether to:
 - Cancel the flight, and have the equipment fixed, or
 - Continue the flight by deferring inoperative equipment based on [FAR 91.213\(d\)](#)
- FAR 91.213(d) – Verify the equipment is not required by any of the following:
 - Day & Night VFR required instruments ([FAR 91.205](#))
 - Kinds of Equipment List and Equipment List
 - Type Certificate
 - Airworthiness Directive
- If the equipment is not required, it must be
 - Deactivated (or removed) and placarded as inoperative
 - Any maintenance must be accomplished by certified maintenance personnel



Airworthiness

Without an MEL

FAR 91.205: Required Equipment for Day/Night VFR

- Day VFR: TOMATO FFLAAMES
 - Tachometer for each engine
 - Oil pressure gauge for each engine
 - Manifold pressure gauge (altitude engine)
 - Airspeed Indicator
 - Temperature gauge (liquid-cooled engine)
 - Oil temperature gauge (air-cooled engine)
 - Fuel gauge for each tank
 - Flotation gear (for hire beyond glide distance)
 - Landing gear position indicator
 - Altimeter
 - Anti-Collision Lights (certified after Mar 11, 1996)
 - Magnetic Compass
 - Emergency Locator Transmitter
 - Safety Belts / Should Harnesses

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- Night VFR: FLAPS
 - Fuses (if required)
 - Landing Light (electric)
 - Anti-Collision Lights
 - Position Lights
 - Source of electricity for all equipment



Airworthiness

Without an MEL

Kinds of Equipment List

- Chapter 2 of the POH
- Lists manufacturer required equipment based on type of flight

Equipment List

- Usually found in the weight and balance data and/or POH
- Specifies required equipment and equipment approved for installation in the aircraft



Airworthiness

Without an MEL

Type Certificate

- Formal description of the airplane, engine, propeller
- Specifies the type of engine, propeller, number of seats, etc.
- Lists limitations & information required for type certification
- Cannot be changed without a supplemental type certificate
- Found on [the FAA TCDS website](#)



Airworthiness

Without an MEL

Airworthiness Directives (AD)

- Notifies pilots of unsafe conditions and the required action
 - Like a recall on a car
- Two Categories:
 - Emergency, requiring immediate compliance prior to further flight
 - Less urgent nature requiring compliance in a specified time period
- Not airworthy if an AD is not complied with by the designated date
 - Must maintain record of compliance
- Special Airworthiness Information Bulletin (SAIB)
 - Info & guidance for safety issues that don't meet AD criteria
 - Tool to alert, educate, and make safety recommendations

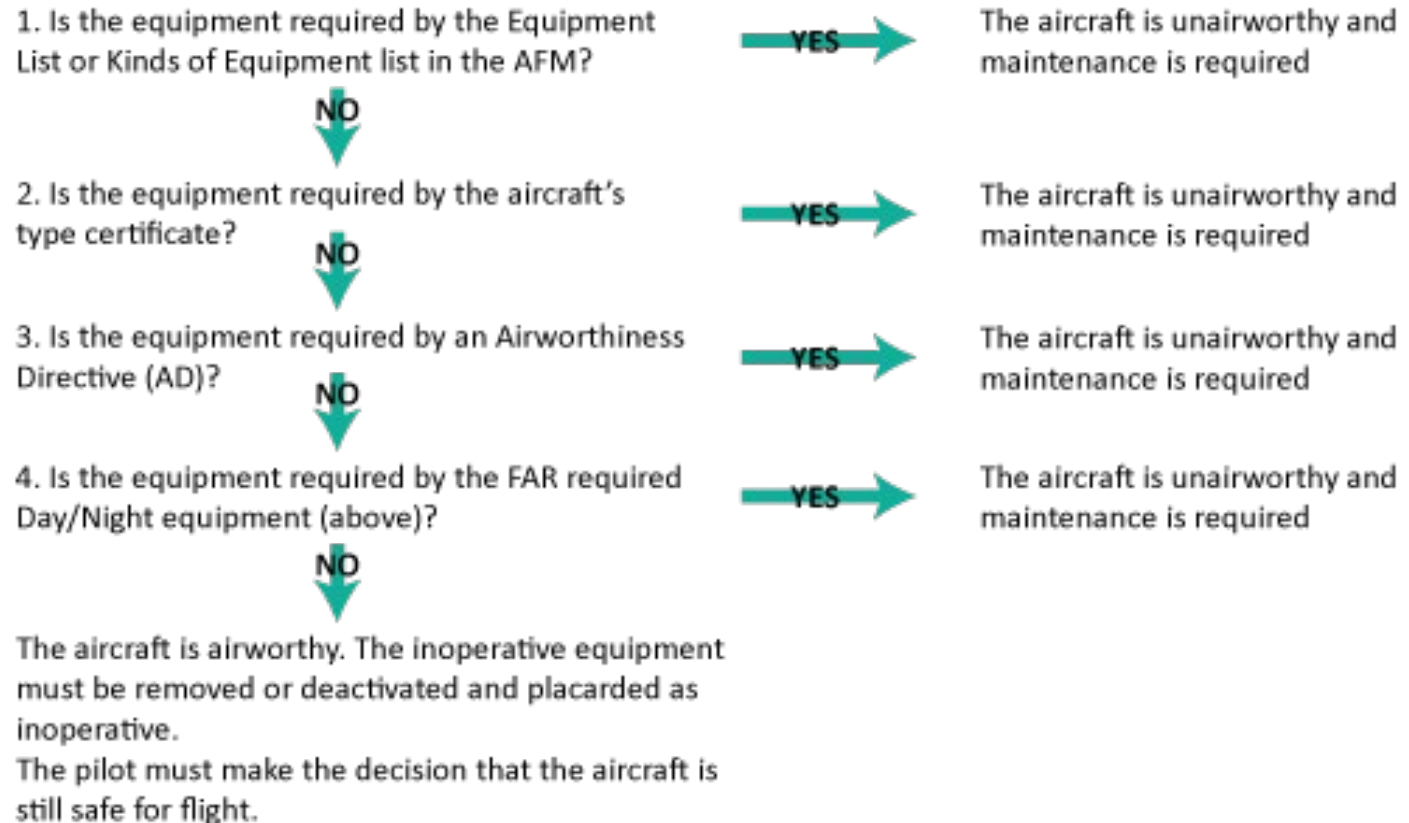


Airworthiness

Without an MEL

Inoperative Equipment Decision Sequence

During the preflight inspection, the pilot recognizes inoperative instruments or equipment.



Airworthiness

With an MEL

- MEL: Minimum Equipment List
 - Precise listing of required equipment based on the type of flight
 - Basically, combines 91.205, Kinds of Equipment List, ADs, & Type Certificate into 1 doc
 - Common at airlines, but less common in general aviation
 - Must be requested from the FAA
- Required Equipment
 - If equipment is inoperative, refer to the MEL to determine if it's required
 - If the equipment is not deferrable, it must be repaired prior to flight
 - A special flight permit can be obtained if necessary to make repairs



Airworthiness

Required Inspections (av1ate)

- **Annual**
 - Aircraft less than 12,500 pounds flown for business or pleasure
 - Requires an Airframe & Powerplant mechanic (A&P) with an Inspection Authorization (IA)
 - May be substituted for a required 100-hour inspection
- **VOR:** Must have been checked in the preceding 30 days (IFR requirement)
- **100 Hour**
 - Aircraft less than 12,500 pounds (except turbo powered) used for hire/flight instruction
 - Requires an A&P at an FAA certified repair station, or done by the manufacturer
 - Can exceed 100 hours by no more than 10 hours if enroute to inspection location
- **Altimeter/Pitot Static:** [FAR 91.411](#) – Requires inspection in the last 24 months (IFR)
- **Transponder:** [FAR 91.413](#) – Must be tested and inspected in the last 24 months
- **ELT:** [FAR 91.207\(d\)](#) – If required, must be inspected every 12 calendar months



Airworthiness

Required Documents (ARROW)

- **A**irworthiness Certificate
- **R**egistration Certificate
- **R**adio Operator's License
 - If international
- **O**perating Limitations (POH)
- **W**eight and Balance
 - Specific to the aircraft tail number



Airworthiness

Airworthiness Certificates

- Standard Airworthiness Certificate
 - White
 - Normal, acrobatic, commuter or transport categories
 - Remains in effect if the aircraft receives required maintenance & is registered in the US
- Special Airworthiness Certificate
 - Pink
 - Primary, experimental, restricted, limited, provisional, and light-sport aircraft
 - Limitations
 - Generally, can't be operated for hire & in some cases can't carry passengers
 - May be restricted to operations over sparsely populated areas or water

Primary: [FAR 91.325](#)

Experimental: [FAR 91.319](#)

Restricted: [FAR 91.313](#)

Limited: [FAR 91.315](#)

Provisional: [FAR 91.317](#)

Light-Sport: [FAR 91.327](#)



Special Flight Permit

FAR 21.197: Special Flight Permit

- Authorization for an aircraft that is not currently airworthy, but is safe for a specific flight
 - Flying to an airport where repairs or maintenance can be performed
 - Delivering or exporting an aircraft
 - Conducting customer demonstration flights
- Obtaining a Special Flight Permit
 - Contact the local FSDO or Designated Airworthiness Representative
 - FAR 21.199: Must submit a statement to the FAA describing the flight



Record Keeping (FAR 91.417)

- Required inspections are in the aircraft and engine logbooks
- 100-Hour, Annual Inspection must be kept for 1 year or until the work is repeated
- Records containing the following must be retained and transferred with the aircraft if sold:
 - Total time in service (airframe, engine, propeller, rotor)
 - Status of life-limited parts & Time since last required overhaul
 - Current inspection status of the airplane
 - Status of any ADs
 - Copies of forms for major alternations



Record Keeping (FAR 91.417)

- Removing/Installing Equipment not on the Equipment List
 - AMT must update the weight & balance for the new empty weight and CG, as well as the equipment list
- Repairs and Alterations
 - Major: Approved on Form 337 by a certified repair station, A&P with an IA, or a designated rep ([14 CFR Part 43](#))
 - Minor: Approved with an entry in the maintenance records by an A&P or certified repair station



Preventive Maintenance (AC 43-12)

- Who can perform Preventive Maintenance?
 - FAR 43.3(g): Holder of a Part 61 pilot certificate
 - Part 43 Appendix A(c)(30): At least a private pilot & registered owner
- What is Preventive Maintenance?
 - FAR 1.1: Simple or minor preservation operations & replacement of small standard parts not involving complex assembly operations
 - Part 43 Appendix A(c)(30): Exhaustive list of authorized maintenance

**Be honest with your ability to
perform the work satisfactorily & safely**



Preventive Maintenance (AC 43-12)

- Performance Rules
 - FAR 43.13: Basically, requires quality work and parts
- Maintenance Records
 - FAR 43.9(a): Any work done requires a logbook entry
 - Description, completion date, signature, certificate #, kind of certificate
- Return to Service
 - FAR 43.7(f): At least a private pilot may approve a return to service



Inoperative Equipment in Flight

- Maintenance deferrals discussed here are not used for inflight discrepancies
- POH procedures take precedence
- Combine with risk assessment & mitigation techniques to assist in decision making





Questions?