

Maintenance Requirements

The owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition. However, the PIC must determine that the aircraft is in condition for safe flight. Maintenance, preventive maintenance, and alterations must follow FAA regulations.

Maintenance Log Books

There are maintenance log books for each aircraft. Most aircraft have a separate log for each airframe, engine, propeller, and “appliances”. The log books have entries for (1) maintenance/preventive maintenance/alterations, (2) inspections, and (3) approval for return to service after maintenance.

Inspections Required by Regulations

The regulations require the following inspections. You can check that they were done by finding the entries in the maintenance log book.

Condition	Inspection	Period
1. All aircraft	Annual inspection	12 calendar months
2. Carrying any passenger for hire or flight instruction for hire	100-hour inspection	100 hours of “time in service” (see note)
3. All aircraft with ELTs	Emergency locator transmitter inspection	12 calendar months
4. Using a transponder	ATC transponder test and inspection	24 calendar months
5. IFR in controlled airspace	Altimeter system test and inspection	24 calendar months
6. As required by mandatory items in the “airworthiness limitations” section of manufacturer's maintenance manual or instructions for continued airworthiness (ICA)		
7. As required by FAA airworthiness directives		

Notes:

- For maintenance purposes, “time in service” means the time in the air (wheels off the ground). Most owner/operators use tach time as an FAA-accepted approximation.
- In our case, the *Cessna 172R/S Maintenance Manual* currently has no airworthiness limitations. The *Garmin 400W Series Instructions For Continued Airworthiness* also has none.
- There are a few airworthiness directives for 172s that require periodic inspections. You can see them on Flight Schedule Pro, but this is unofficial. The official list is on the FAA Web site.

Uh Oh, Something's Broken

Each discrepancy *must* be repaired, except (1) as allowed by an approved minimum equipment list (MEL), (2) if it fits the §91.213(d) rule, or (3) if allowed by the FAA under a special flight permit.

Approved Minimum Equipment List (MEL)

A Minimum Equipment List (MEL) is a list of equipment on an aircraft, with actions to take and operational limitations for various failures. An MEL is developed by an aircraft operator and then approved by the local FAA Flight Standards District Office (FSDO). Each approved MEL is specific to an operator and an aircraft, and the aircraft must carry a FAA letter of approval on board. A MEL is not something that you'll see in our flight training situation or in personal aviation, but you need to know that it exists.

The §91.213(d) Rule

This rule:

- Applies only to inoperative instruments or equipment, not other kinds of discrepancies;
- Can only be used for part 91 flights; and
- Does not apply to turbine-powered airplanes or powered-lift aircraft.

The inoperative instruments or equipment must not be listed on any of these lists:

- Required items in the aircraft's Equipment List (see POH section 6);
- Required items for the kind of flight (VFR/IFR/day/night) in the aircraft's Kinds of Operations Equipment List (see POH section 2), if it has one;
- Any rule in part 91 as required for the kind of flight (see mainly §91.205, but also §91.109, §91.131, §91.176, §91.180, §91.189, §91.207, §91.215, and §91.225);
- Any applicable airworthiness directive's required instruments or equipment list; or
- The VFR-day instruments and equipment required in the applicable airworthiness regulations under which the aircraft was type certificated. This list can be hard to find, but presumably, the POH's Equipment List will cover these requirements.

The following steps must be taken before takeoff:

- The inoperative instruments and equipment must be removed by a mechanic, the controls marked as inoperative, and logged in the aircraft maintenance log; *OR*
- The inoperative instruments and equipment must be deactivated and marked as inoperative. This can be done by a pilot rated for the aircraft, if the deactivations is simple enough to not be considered "maintenance" per part 43 appendix A (for example, pulling a circuit breaker). Otherwise, it must be done by a mechanic and logged in the aircraft maintenance log.
- *In either case*, a pilot rated for the aircraft or a mechanic must determine that the inoperative instruments or equipment do not constitute a hazard to the aircraft.