

Weight and Balance / Equipment List

These two documents are not thought of together much because:

- Neither W&B or the Equipment List show up in the FAR 91.400s section, Advisory Circular 93.9C Maintenance Records, or FAR 43 Appendix D - Scope and Detail of Items (as Applicable to the Particular Aircraft) To Be Included in Annual and 100-Hour Inspections so neither is a "maintenance record"
- W&B is taught in pilot training but the Equipment List is poorly to not covered

So what make the owner/operator responsible for these records? FAR 91.403(a)

If you are convinced that the Equipment List is a part of Aircraft Records and yours is missing or not accurate, scroll down to ["What Do I Do Now?"](#).

If not, read all this regulatory, Advisory Circular, and Handbook information.

This from FARs Part 91

91.103 Preflight action.

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

Analysis

Here we have clear regulatory guidance to use your gross or current weight in calculating loading and runway required. Accurate weights are impossible to calculate if the EW (Empty Weight) and (EWCG) Empty Weight Center of Gravity are in question.

This from FAA -H-8083-1A, Aircraft Weight and Balance Handbook

Equipment List.

- A list of items approved by the FAA for installation in a particular aircraft.
- The list includes the name, part number, weight, and arm of the component.
- Installation or removal of an item in the **equipment list** is considered to be a minor alteration.

Equipment List

- The FAA considers addition or removal of equipment included in this list to be a minor alteration.
- The weights and arms are included with the items in the equipment list, and these minor alterations can be done and the aircraft approved for return to service by an appropriately rated aircraft mechanic or repairman.
- The only documentation required is an entry in the aircraft maintenance records and the appropriate change to the weight and balance record in the POH/AFM.

Major Alteration and Repair

- Within the following text, information concerning major repairs or major alterations does not apply to any aircraft within the light-sport category. This category of aircraft is not eligible for major repairs or alterations.
- Any major alteration or repair requires the work to be done by an appropriately-rated aircraft mechanic or facility.
- The work must be checked for conformity to FAA-approved data and signed off by an aircraft mechanic holding an Inspection Authorization, or by an authorized agent of an appropriately rated FAA-approved repair station.
- A repair station record or FAA Form 337, Major Repair and Alteration, must be completed which describes the work.
- A dated and signed revision to the weight and balance record is made and kept with the maintenance records, and the airplane's new empty weight and empty weight arm or moment index are entered in the POH/AFM.

This from FAR 23 for aircraft that are not Transport Category

23.29 Empty weight and corresponding center of gravity.

(b) The condition of the airplane at the time of determining empty weight must be one that is well defined and can be easily repeated.

This from FAR 25 for Transport Category Aircraft

25.29 Empty weight and corresponding center of gravity

(b) The condition of the airplane at the time of determining empty weight must be one that is well defined and can be easily repeated.

This from AC 43.13b Chapter 10

The TCDS do not list the basic required equipment prescribed by the applicable airworthiness regulations for certification. Refer to the manufacturer's equipment list for such information.

10-19. EQUIPMENT LIST.

A list of the equipment included in the certificated empty weight may be found in either the approved aircraft flight manual or the weight and balance report. Enter into the weight and balance report all required, optional, and special equipment installed in the aircraft at time of weighing and/or subsequent equipment changes.

a. Required equipment

items are listed in the pertinent Aircraft Specifications.

b. Optional equipment

items are listed in the pertinent Aircraft Specifications and may be installed in the aircraft at the option of the owner.

c. Special equipment

is any item not corresponding exactly to the descriptive information in the Aircraft Specifications. This includes items such as emergency locator transmitter (ELT), tail or logo lights, instruments, ashtrays, radios, navigation lights, and carpets.

d. Required and optional equipment

may be shown on the equipment list with reference to the pertinent item number listed in the applicable specifications only when they are identical to that number item with reference to description, weight, and arm given in the specifications. Show all special equipment items with reference to the item by name, make, model, weight, and arm. When the arm for such an item is not available, determine by actual measurement.

10-20. EQUIPMENT CHANGE.

The person making an equipment change is obligated to make an entry on the equipment list indicating items added, removed, or relocated with the date accomplished, and identify himself by name and certificate number in the aircraft records. Examples of items so affected are the installation of extra fuel tanks, seats, and baggage compartments. Figure 10-15 illustrates the effect on balance when equipment items are added within the acceptable c.g. limits and fore and aft of the established c.g. limits.

Analysis

The regulations for Part 23 and Part 25 are typically vague and define the goal of a record rather than specifying the record itself.

The FAA often relies on Handbooks and Advisory Circulars to establish the intent of the regulations and that is the case here.

Both the Weight and Balance Handbook and AC 43.13b are clear in the use of an Equipment List as the record to comply with FAR 23.29 and 25.29.

This only establishes that an Equipment List is a required Aircraft Record and anyone who changes equipment is obligated to update the equipment list. How tough is "obligated" to prosecute in terms of records violations? I'm not sure anyone cares.

My Equipment List is missing or just not accurate. What Do I Do Now?

Can the Owner/Operator do this or does it have to be an A&P/IA?

OPINION:

- The Handbook and Advisory Circular information clearly indicate this the person(s) making changes to the aircraft should have updated the Equipment List but that didn't happen.
- The owner/operator is responsible for airworthiness so I believe they have the right to manage this record.
- The Equipment List is just that. It is not a maintenance record per Regulations or Advisory Circular.

Step 1 Find out what the FAA knows about your aircraft

- Go to <http://aircraft.faa.gov/e.gov/ND/> to order the documents that the FAA has on file for your aircraft.

Step 2 Find out what your Aircraft Manufacturer knows about your aircraft

- If your manufacturer is still in business, call the technical services department and ask for a copy of the Original Delivery Equipment List. They should have a record.

Step 3 Gather every aircraft record you can find for your aircraft

- Logbooks
- 337s
- Invoices
- Equipment List
- Weight & Balance
- POH/Approved Flight Manual with Approved Supplements
- 406 ELT registration
- Anything else you can find

Step 4 Download and print the Sample Equipment List (Excel file)

Step 5 Download and print the ATA Code List (Excel file)

Step 6 Get a current copy of the Manufacturer's Illustrated Parts Catalog

Step 7 Review all the current records and start adding components to the list from Step 4

- Look up each component in the IPC as you enter it into the Equipment List
 - If the component is listed by Part Number in the IPC, the installation criterion is Original Equipment
 - If the component is not listed in the IPC, try to determine what airworthiness criterion was used to install (Minor Alteration, Major Alteration - STC, Service Bulletin, Airworthiness Directive, Etc.
 - If your IPC is listed by ATA Code, use that to organize the Equipment List

- If your IPC does not use ATA Code, use the IPC chapter references to organize the Equipment List
- Be mindful of the date of installation for added, removed, or changed equipment because you should be able to cross reference these dates to updated Weight and Balance calculations

Step 8 Go to the airplane with tools, mirrors, and good flashlights

The goal is to validate the information from the previous records(if they were available)

- Remove the spinner, if installed, and validate the prop P/N, and S/N
 - Looks for any signs of damage while checking numbers
 - Reinstall spinner
- Remove cowl and verify P/N and S/N for
 - Engine
 - Mags
 - Fuel system components
 - Governor
 - Vac pump
 - Starter
 - Oil cooler
 - Turbos
 - Any other installed accessories
 - Look for leaks, chafing components, and any other damage
 - Reinstall cowl
- Gain access to the cabin and cockpit
 - Verify instruments and avionics by P/N and S/N
 - The various mirrors and flashlights should be helpful here
 - Record seat belt P/N and S/N because there are some generic seat belt Airworthiness Directives
 - Record any components like seats, windows, overhead consoles, etc. that may be either optional from the factory or installed by alteration
 - **Note**, If there is one part number for a factory seat and that is the one installed, it doesn't need to go on the equipment list - unless the POH says the seat is removable for flight

Step 9 Have the new Equipment List verified at your next 100 Hr or Annual Inspection

Step 10 Have the aircraft weighed for a new Empty Weight and EWCG after list verification

Note: Aircraft, like humans, often gain weight as they age. This is why aircraft in commercial service under Part 135 or 121 will be required to have the aircraft weighed for a new W&B benchmark at a three year interval or as required by the Operating Certificate.