

CHAPTER 85. EVALUATE SPECIAL EQUIPMENT OR TEST APPARATUS

SECTION 1. BACKGROUND

1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3626/3658

B. Avionics: 5626/5658

3. OBJECTIVE. This chapter provides guidance for evaluating special equipment and test apparatus used by a certificate holder in maintaining aircraft and their associated components.

5. GENERAL. A certificate holder must make a determination of acceptability for equivalency of special equipment and/or test apparatus used in maintaining aircraft and their associated components.

A. The term equivalency, as used throughout this chapter, means equivalent to that recommended by the Original Equipment Manufacturer (OEM) for the purpose of performing specific tests or making required measurements to determine airworthiness. To determine equivalency, a certificate holder should compare the required test operations or specifications and the technical data of the special equipment or test apparatus (both the data recommended by the manufacturer and the data proposed by the certificate holder). The special equipment or test apparatus may look different, be made of different materials, be a different color, etc. However, as long as the tool is functionally equivalent for the specific test application, the tool may be used.

B. The accuracy of special equipment or test apparatus used to perform a specific task should be at least equal to that recommended by the manufacturer.

7. BACKGROUND.

A. The use of equivalent equipment was first addressed in the Civil Aeronautics Manual 52 (CAM 52), Repair Station Certificates, which preceded Title 14 of the Code of Federal Regulations (14 CFR) part 145. Specifically, CAM 52, § 52.30-1 stated, “The applicant will have the responsibility of choosing suitable tools and equipment (which may be either equipment or tools recommended by a manufacturer in

the overhaul or repair of his product or the equivalent of such equipment or tools). . . . The inspecting CAA [Civil Aviation Authority] agent will determine if these tools, equipment, and materials are satisfactory within the intent of this regulation.” This implied that the CAA inspector was to make a determination of equivalency. However, this statement simply established that the CAA inspector determined if the equipment was satisfactory. The intent remains the same today. Today, 14 CFR part 43, § 43.13(a) states, “If special equipment or test apparatus is recommended by the manufacturer involved, he must use that equipment or apparatus or its equivalent acceptable to the Administrator.”

B. A finding of equivalency can only be made based on an evaluation of a technical data file. Additionally, demonstrating functionality of the special equipment or test apparatus may sometimes be required. A technical data file may include, but is not limited to, data, drawings, specifications, instructions, photographs, templates, certificates, and reports. For calibration equipment, the technical data file should also include data sheets attesting to its accuracy when calibration standards are necessary. This file should also describe any special manufacturing processes that are used in the controlling processes, including gauges and recording equipment. If calibration equipment is involved, documented procedures will be used to evaluate the adequacy of the calibration equipment, and the equipment must be traceable to the National Institute of Standards and Technology (NIST) or to a standard provided by the equipment manufacturer. With foreign equipment, a standard of the country of manufacture may be used if found acceptable by the Federal Aviation Administration (FAA).

C. Most of the test apparatus used for making airworthiness decisions are generic in nature and designed to make measurements that are not unique to a specific manufacturer’s product or process. Equipment that is not “special” in nature only needs to be designed and calibrated to make measurements within the specific manufacturer’s tolerances to be considered equivalent for those tests or measurements.

NOTE: The FAA has allowed the industry to fabricate their own equipment and/or apparatus (test fixtures, jigs, tooling, etc.) without much FAA assessment. Many certificate holders, especially those which employ engineering departments, are very well versed in fabricating special equipment or test apparatus. In some cases, the fabricated special equipment or test apparatus has exceeded the component manufacturer's requirements for accuracy, reliability, etc.

(1) Occasionally, a tool that was manufactured by an air carrier did not always produce the same results as the tool from the OEM. Further, previous industry-wide validations revealed that some tools were not equivalent in function to the OEM's specifications.

(2) Some tools had been manufactured by a method known as reverse engineering. Reverse engineering alone without data, drawings, testing, or reports may not adequately produce a tool or fixture functionally equivalent to an OEM's requirements.

(3) With recent technological advances, highly specialized test equipment or test apparatus is frequently required. Use of such equipment supports the continued airworthiness of aircraft systems and components to the manufacturer's specifications and tolerances.

(4) Determining the equivalency of equipment and/or apparatus is the primary responsibility of the certificate holder, not the FAA. The basis of equivalency for equipment or apparatus for products being maintained must meet the OEM's standards and specifications for tolerances and accuracy.

SECTION 2. PROCEDURES

1. PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Knowledge of the regulatory requirements of 14 CFR parts 43 and 145
- Successful completion of the General/Air Carrier Airworthiness Safety Inspectors Indoctrination Course or equivalent
- Previous experience with certification or surveillance of part 121 and 135 operators and part 145 repair stations

B. Coordination. This task may require coordination with other specialties, regions, or district offices.

3. REFERENCES, FORMS, AND JOB AIDS.

A. References:

- 14 CFR parts 43, 121, 135, and 145

B. Forms. None.

C. Job Aids. None.

5. PROCEDURES.

A. Because it is the primary responsibility of the certificate holder, the FAA principal inspector (PI) may only make an acceptance of functional equivalency for special equipment or test apparatus. The following procedures are listed as a reference for making this determination.

(1) Ensure that the limitations, parameters, and reliability of the equipment allow it to function equivalently to the OEM's recommended equipment for the specific test application. This may include the review of data from the OEM or another source of data used to manufacture the equipment.

(2) Compare the technical data used to that of the manufacturer (if obtainable; often, manufacturers are reluctant to release technical information about tools and test equipment) and that used by the certificate holder. If the OEM technical data is not available, then the certificate holder must perform an evaluation to make a determination of functional equivalency. If needed, observe test demonstrations of the equipment.

(3) Ensure that specific instructions pertaining to the proper use of any special equipment or test apparatus are provided in and adequately referenced in

the repair station's Inspection Procedures Manual (IPM) or the air carrier's Continuous Airworthiness Maintenance Program (CAMP).

(4) Ensure that the certificate holder has included any special equipment or test apparatus that requires inspection and/or calibration in their test inspection and calibration programs. They should also address the regular inspection and calibration of any special equipment or test apparatus used for making final airworthiness determinations.

(5) The FAA recommends that the PI review the repair station's IPM or the air carrier's CAMP to ensure that it has adequate procedures in place, if applicable, for manufacturing and/or determining equivalency of any special equipment or test apparatus in use.

NOTE: An Aircraft Engineering Division AIR-100 memorandum, dated December 21, 1999, states, "Designated Engineering Representatives (DER) may not approve or determine equivalency of tooling and test equipment." Furthermore, neither the FAA nor a DER may approve equipment and/or a test apparatus. The FAA and DER may only make an acceptance of functional equivalency for special equipment or a test apparatus. It is important to emphasize that the burden of demonstrating equivalency is borne by the certificate holder and not the FAA.

(6) If unable to make a determination of equivalency from the technical data or through testing, the PI will coordinate with the Aircraft Evaluation Group with respect to the appropriate Aircraft/Rotorcraft/Engine Certification Office to assist in determining equivalency.

B. Standard industry practice would dictate that any special equipment or test apparatus that is used to make a critical airworthiness decision or that requires calibration or inspection be given a unique part number and serial number to identify it within the certificate holder's inventory system.

C. Ensure that the OEM maintains the records dealing with special equipment or test apparatus in a manner acceptable to the FAA for as long as the records are used for making airworthiness determinations.

7. TASK OUTCOMES.

A. File PTRS Data Sheet.

B. Document Task. File all supporting paperwork in the operator's/applicant's office file.

9. FUTURE ACTIVITIES. Conduct normal surveillance of the repair station's IPM or air carrier's CAMP to ensure that procedures are adequate.