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article on which the maintenance, preventive maintenance, or alteration was performed.

(c) A certificated repair station must retain the records required by this section for at least 2 years from the date the article was approved for return to service.

(d) A certificated repair station must make all required records available for inspection by the FAA and the National Transportation Safety Board.

§ 145.221 Service difficulty reports.

(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.

(b) The report required under paragraph (a) of this section must include as much of the following information as is available:

- (1) Aircraft registration number;
- (2) Type, make, and model of the article;
- (3) Date of the discovery of the failure, malfunction, or defect;
- (4) Nature of the failure, malfunction, or defect;
- (5) Time since last overhaul, if applicable;
- (6) Apparent cause of the failure, malfunction, or defect; and
- (7) Other pertinent information that is necessary for more complete identification, determination of seriousness, or corrective action.

(c) The holder of a repair station certificate that is also the holder of a part 121, 125, or 135 certificate; type certificate (including a supplemental type certificate); parts manufacturer approval; or technical standard order authorization, or that is the licensee of a type certificate holder, does not need to report a failure, malfunction, or defect under this section if the failure, malfunction, or defect has been reported under parts 21, 121, 125, or 135 of this chapter.

(d) A certificated repair station may submit a service difficulty report for the following:

(1) A part 121 certificate holder, provided the report meets the requirements of part 121 of this chapter, as appropriate.

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(2) A part 125 certificate holder, provided the report meets the requirements of part 125 of this chapter, as appropriate.

(3) A part 135 certificate holder, provided the report meets the requirements of part 135 of the chapter, as appropriate.

(e) A certificated repair station authorized to report a failure, malfunction, or defect under paragraph (d) of this section must not report the same failure, malfunction, or defect under paragraph (a) of this section. A copy of the report submitted under paragraph (d) of this section must be forwarded to the certificate holder.

[Doc. No. FAA–1999–5836, 66 FR 41117, Aug. 6, 2001, as amended by Amdt. 22, 68 FR 75382, Dec. 30, 2003; Amdt. 145–26, 70 FR 76979, Dec. 29, 2005; Amdt. 145–30, 79 FR 46985, Aug. 12, 2014; Amdt. 145–30A, 79 FR 66607, Nov. 10, 2014]

§ 145.223 FAA inspections.

(a) A certificated repair station must allow the FAA to inspect that repair station at any time to determine compliance with this chapter.

(b) A certificated repair station may not contract for the performance of a maintenance function on an article with a noncertificated person unless it provides in its contract with the noncertificated person that the FAA may make an inspection and observe the performance of the noncertificated person's work on the article.

(c) A certificated repair station may not return to service any article on which a maintenance function was performed by a noncertificated person if the noncertificated person does not permit the FAA to make the inspection described in paragraph (b) of this section.

PART 147—AVIATION MAINTENANCE TECHNICIAN SCHOOLS

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AUTHORITY: 49 U.S.C. 106(g), 40113, 44701-44702, 44707-44709.

SOURCE: Docket No. 1157, 27 FR 6669 July 13, 1962, unless otherwise noted.

Subpart A—General

§ 147.1 Applicability.

This part prescribes the requirements for issuing aviation maintenance technician school certificates and associated ratings and the general operating rules for the holders of those certificates and ratings.

§ 147.3 Certificate required.

No person may operate as a certificated aviation maintenance technician school without, or in violation of, an aviation maintenance technician school certificate issued under this part.

[Doc. No. 15196, 41 FR 47230, Oct. 28, 1976]

§ 147.5 Application and issue.

(a) An application for a certificate and rating, or for an additional rating, under this part is made on a form and in a manner prescribed by the Administrator, and submitted with—

(1) A description of the proposed curriculum;

(2) A list of the facilities and materials to be used;

(3) A list of its instructors, including the kind of certificate and ratings held and the certificate numbers; and

(4) A statement of the maximum number of students it expects to teach at any one time.

(b) An applicant who meets the requirements of this part is entitled to an aviation maintenance technician school certificate and associated ratings prescribing such operations specifications and limitations as are necessary in the interests of safety.

[Doc. No. 1157, 27 FR 6669, July 13, 1962, as amended by Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.7 Duration of certificates.

(a) An aviation maintenance technician school certificate or rating is effective until it is surrendered, suspended, or revoked.

(b) The holder of a certificate that is surrendered, suspended, or revoked, shall return it to the Administrator.

[Doc. No. 1157, 27 FR 6669, July 19, 1962, as amended by Amdt. 147-3, 41 FR 47230, Oct. 28, 1976]

§ 147.8 Employment of former FAA employees.

(a) Except as specified in paragraph (c) of this section, no holder of an aviation maintenance technician certificate may knowingly employ or make a contractual arrangement which permits an individual to act as an agent or representative of the certificate holder in any matter before the Federal Aviation Administration if the individual, in the preceding 2 years—

(1) Served as, or was directly responsible for the oversight of, a Flight Standards Service aviation safety inspector; and

(2) Had direct responsibility to inspect, or oversee the inspection of, the operations of the certificate holder.

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(b) For the purpose of this section, an individual shall be considered to be acting as an agent or representative of a certificate holder in a matter before the agency if the individual makes any written or oral communication on behalf of the certificate holder to the agency (or any of its officers or employees) in connection with a particular matter, whether or not involving a specific party and without regard to whether the individual has participated in, or had responsibility for, the particular matter while serving as a Flight Standards Service aviation safety inspector.

(c) The provisions of this section do not prohibit a holder of an aviation maintenance technician school certificate from knowingly employing or making a contractual arrangement which permits an individual to act as an agent or representative of the certificate holder in any matter before the Federal Aviation Administration if the individual was employed by the certificate holder before October 21, 2011.

[Doc. No. FAA–2008–1154, 76 FR 52237, Aug. 22, 2011]

Subpart B—Certification Requirements

§ 147.11 Ratings.

The following ratings are issued under this part:

- (a) Airframe.
- (b) Powerplant.
- (c) Airframe and powerplant.

§ 147.13 Facilities, equipment, and material requirements.

An applicant for an aviation maintenance technician school certificate and rating, or for an additional rating, must have at least the facilities, equipment, and materials specified in §§147.15 to 147.19 that are appropriate to the rating he seeks.

§ 147.15 Space requirements.

An applicant for an aviation maintenance technician school certificate and rating, or for an additional rating, must have such of the following properly heated, lighted, and ventilated facilities as are appropriate to the rating he seeks and as the Administrator de-

termines are appropriate for the maximum number of students expected to be taught at any time:

(a) An enclosed classroom suitable for teaching theory classes.

(b) Suitable facilities, either central or located in training areas, arranged to assure proper separation from the working space, for parts, tools, materials, and similar articles.

(c) Suitable area for application of finishing materials, including paint spraying.

(d) Suitable areas equipped with washtank and degreasing equipment with air pressure or other adequate cleaning equipment.

(e) Suitable facilities for running engines.

(f) Suitable area with adequate equipment, including benches, tables, and test equipment, to disassemble, service, and inspect.

(1) Ignition, electrical equipment, and appliances;

(2) Carburetors and fuel systems; and

(3) Hydraulic and vacuum systems for aircraft, aircraft engines, and their appliances.

(g) Suitable space with adequate equipment, including tables, benches, stands, and jacks, for disassembling, inspecting, and rigging aircraft.

(h) Suitable space with adequate equipment for disassembling, inspecting, assembling, troubleshooting, and timing engines.

[Amdt. 147-2, 35 FR 5533, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.17 Instructional equipment requirements.

(a) An applicant for a mechanic school certificate and rating, or for an additional rating, must have such of the following instructional equipment as is appropriate to the rating he seeks:

(1) Various kinds of airframe structures, airframe systems and components, powerplants, and powerplant systems and components (including propellers), of a quantity and type suitable to complete the practical projects required by its approved curriculums.

(2) At least one aircraft of a type currently certificated by FAA for private

or commercial operation, with powerplant, propeller, instruments, navigation and communications equipment, landing lights, and other equipment and accessories on which a maintenance technician might be required to work and with which the technician should be familiar.

(b) The equipment required by paragraph (a) of this section need not be in an airworthy condition. However, if it was damaged, it must have been repaired enough for complete assembly.

(c) Airframes, powerplants, propellers, appliances, and components thereof, on which instruction is to be given, and from which practical working experience is to be gained, must be so diversified as to show the different methods of construction, assembly, inspection, and operation when installed in an aircraft for use. There must be enough units so that not more than eight students will work on any one unit at a time.

(d) If the aircraft used for instructional purposes does not have retractable landing gear and wing flaps, the school must provide training aids, or operational mock-ups of them.

[Doc. No. 1157, 27 FR 6669, July 19, 1962, as amended by Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.19 Materials, special tools, and shop equipment requirements.

An applicant for an aviation maintenance technician school certificate and rating, or for an additional rating, must have an adequate supply of material, special tools, and such of the shop equipment as are appropriate to the approved curriculum of the school and are used in constructing and maintaining aircraft, to assure that each student will be properly instructed. The special tools and shop equipment must be in satisfactory working condition for the purpose for which they are to be used.

[Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.21 General curriculum requirements.

(a) An applicant for an aviation maintenance technician school certificate and rating, or for an additional rating, must have an approved curriculum that is designed to qualify his

students to perform the duties of a mechanic for a particular rating or ratings.

(b) The curriculum must offer at least the following number of hours of instruction for the rating shown, and the instruction unit hour shall not be less than 50 minutes in length—

(1) Airframe—1,150 hours (400 general plus 750 airframe).

(2) Powerplant—1,150 hours (400 general plus 750 powerplant).

(3) Combined airframe and powerplant—1,900 hours (400 general plus 750 airframe and 750 powerplant).

(c) The curriculum must cover the subjects and items prescribed in appendixes B, C, or D, as applicable. Each item must be taught to at least the indicated level of proficiency, as defined in appendix A.

(d) The curriculum must show—

(1) The required practical projects to be completed;

(2) For each subject, the proportions of theory and other instruction to be given; and

(3) A list of the minimum required school tests to be given.

(e) Notwithstanding the provisions of paragraphs (a) through (d) of this section and § 147.11, the holder of a certificate issued under subpart B of this part may apply for and receive approval of special courses in the performance of special inspection and preventive maintenance programs for a primary category aircraft type certificated under § 21.24(b) of this chapter. The school may also issue certificates of competency to persons successfully completing such courses provided that all other requirements of this part are met and the certificate of competency specifies the aircraft make and model to which the certificate applies.

[Doc. No. 1157, 27 FR 6669, July 13, 1962, as amended by Amdt. 147-1, 32 FR 5770 Apr. 11, 1967; Amdt. 147-5, 57 FR 28959, June 29, 1992; Amdt. 147-6, 57 FR 41370, Sept. 9, 1992]

§ 147.23 Instructor requirements.

An applicant for an aviation maintenance technician school certificate and rating, or for an additional rating, must provide the number of instructors holding appropriate mechanic certificates and ratings that the Administrator determines necessary to provide

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adequate instruction and supervision of the students, including at least one such instructor for each 25 students in each shop class. However, the applicant may provide specialized instructors, who are not certificated mechanics, to teach mathematics, physics, basic electricity, basic hydraulics, drawing, and similar subjects. The applicant is required to maintain a list of the names and qualifications of specialized instructors, and upon request, provide a copy of the list to the FAA.

[Amdt. 147–5, 57 FR 28959, June 29, 1992]

Subpart C—Operating Rules

§ 147.31 Attendance and enrollment, tests, and credit for prior instruction or experience.

(a) A certificated aviation maintenance technician school may not require any student to attend classes of instruction more than 8 hours in any day or more than 6 days or 40 hours in any 7-day period.

(b) Each school shall give an appropriate test to each student who completes a unit of instruction as shown in that school's approved curriculum.

(c) A school may not graduate a student unless he has completed all of the appropriate curriculum requirements. However, the school may credit a student with instruction or previous experience as follows:

(1) A school may credit a student with instruction satisfactorily completed at—

(i) An accredited university, college, junior college;

(ii) An accredited vocational, technical, trade or high school;

(iii) A military technical school;

(iv) A certificated aviation maintenance technician school.

(2) A school may determine the amount of credit to be allowed—

(i) By an entrance test equal to one given to the students who complete a comparable required curriculum subject at the crediting school;

(ii) By an evaluation of an authenticated transcript from the student's former school; or

(iii) In the case of an applicant from a military school, only on the basis of an entrance test.

(3) A school may credit a student with previous aviation maintenance experience comparable to required curriculum subjects. It must determine the amount of credit to be allowed by documents verifying that experience, and by giving the student a test equal to the one given to students who complete the comparable required curriculum subject at the school.

(4) A school may credit a student seeking an additional rating with previous satisfactory completion of the general portion of an AMTS curriculum.

(d) A school may not have more students enrolled than the number stated in its application for a certificate, unless it amends its application and has it approved.

(e) A school shall use an approved system for determining final course grades and for recording student attendance. The system must show hours of absence allowed and show how the missed material will be made available to the student.

[Amdt. 147–2, 35 FR 5534, Apr. 3, 1970, as amended by Amdt. 147–4, 43 FR 22643, May 25, 1978; Amdt. 147–5, 57 FR 28959, June 29, 1992]

§ 147.33 Records.

(a) Each certificated aviation maintenance technician school shall keep a current record of each student enrolled, showing—

(1) His attendance, tests, and grades received on the subjects required by this part;

(2) The instruction credited to him under § 147.31(c), if any; and

(3) The authenticated transcript of his grades from that school.

It shall retain the record for at least two years after the end of the student's enrollment, and shall make each record available for inspection by the Administrator during that period.

(b) Each school shall keep a current progress chart or individual progress record for each of its students, showing the practical projects or laboratory work completed, or to be completed, by the student in each subject.

[Doc. No. 1157, 27 FR 6669, July 13, 1962]

§ 147.35 Transcripts and graduation certificates.

(a) Upon request, each certificated aviation maintenance technician school shall provide a transcript of the student's grades to each student who is graduated from that school or who leaves it before being graduated. An official of the school shall authenticate the transcript. The transcript must state the curriculum in which the student was enrolled, whether the student satisfactorily completed that curriculum, and the final grades the student received.

(b) Each school shall give a graduation certificate or certificate of completion to each student that it graduates. An official of the school shall authenticate the certificate. The certificate must show the date of graduation and the approved curriculum title.

[Doc. No. 1157, 27 FR 6669, July 13, 1962, as amended by Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.36 Maintenance of instructor requirements.

Each certificated aviation maintenance technician school shall, after certification or addition of a rating, continue to provide the number of instructors holding appropriate mechanic certificates and ratings that the Administrator determines necessary to provide adequate instruction to the students, including at least one such instructor for each 25 students in each shop class. The school may continue to provide specialized instructors who are not certificated mechanics to teach mathematics, physics, drawing, basic electricity, basic hydraulics, and similar subjects.

[Amdt. 147-5, 57 FR 28959, June 29, 1992]

§ 147.37 Maintenance of facilities, equipment, and material.

(a) Each certificated aviation maintenance technician school shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

(b) A school may not make a substantial change in facilities, equipment, or material that have been approved for a

particular curriculum, unless that change is approved in advance.

§ 147.38 Maintenance of curriculum requirements.

(a) Each certificated aviation maintenance technician school shall adhere to its approved curriculum. With FAA approval, curriculum subjects may be taught at levels exceeding those shown in appendix A of this part.

(b) A school may not change its approved curriculum unless the change is approved in advance.

[Amdt. 147-2, 35 FR 5534, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28960, June 29, 1992]

§ 147.38a Quality of instruction.

Each certificated aviation maintenance technician school shall provide instruction of such quality that, of its graduates of a curriculum for each rating who apply for a mechanic certificate or additional rating within 60 days after they are graduated, the percentage of those passing the applicable FAA written tests on their first attempt during any period of 24 calendar months is at least the percentage figured as follows:

(a) For a school graduating fewer than 51 students during that period—the national passing norm minus the number 20.

(b) For a school graduating at least 51, but fewer than 201, students during that period—the national passing norm minus the number 15.

(c) For a school graduating more than 200 students during that period—the national passing norm minus the number 10.

As used in this section, "national passing norm" is the number representing the percentage of all graduates (of a curriculum for a particular rating) of all certificated aviation maintenance technician schools who apply for a mechanic certificate or additional rating within 60 days after they are graduated and pass the applicable FAA written tests on their first attempt during the period of 24 calendar months described in this section.

[Amdt. 147-2, 35 FR 5534, Apr. 3, 1970, as amended by Amdt. 147-3, 41 FR 47230, Oct. 28, 1976]

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§ 147.39 Display of certificate.

Each holder of an aviation maintenance technician school certificate and ratings shall display them at a place in the school that is normally accessible to the public and is not obscured. The certificate must be available for inspection by the Administrator.

§ 147.41 Change of location.

The holder of an aviation maintenance technician school certificate may not make any change in the school's location unless the change is approved in advance. If the holder desires to change the location he shall notify the Administrator, in writing, at least 30 days before the date the change is contemplated. If he changes its location without approval, the certificate is revoked.

§ 147.43 Inspection.

The Administrator may, at any time, inspect an aviation maintenance technician school to determine its compliance with this part. Such an inspection is normally made once each six months to determine if the school continues to meet the requirements under which it was originally certificated. After such an inspection is made, the school is notified, in writing, of any deficiencies found during the inspection. Other informal inspections may be made from time to time.

§ 147.45 Advertising.

(a) A certificated aviation maintenance technician school may not make any statement relating to itself that is false or is designed to mislead any person considering enrollment therein.

(b) Whenever an aviation maintenance technician school indicates in advertising that it is a certificated school, it shall clearly distinguish between its approved courses and those that are not approved.

APPENDIX A TO PART 147—CURRICULUM REQUIREMENTS

This appendix defines terms used in appendices B, C, and D of this part, and describes the levels of proficiency at which items under each subject in each curriculum must

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be taught, as outlined in appendices B, C, and D.

(a) Definitions. As used in appendices B, C, and D:

(1) Inspect means to examine by sight and touch.

(2) Check means to verify proper operation.

(3) Troubleshoot means to analyze and identify malfunctions.

(4) Service means to perform functions that assure continued operation.

(5) Repair means to correct a defective condition. Repair of an airframe or powerplant system includes component replacement and adjustment, but not component repair.

(6) Overhaul means to disassemble, inspect, repair as necessary, and check.

(b) Teaching levels. (1) Level 1 requires:

(i) Knowledge of general principles, but no practical application.

(ii) No development of manipulative skill.

(iii) Instruction by lecture, demonstration, and discussion.

(2) Level 2 requires:

(i) Knowledge of general principles, and limited practical application.

(ii) Development of sufficient manipulative skill to perform basic operations.

(iii) Instruction by lecture, demonstration, discussion, and limited practical application.

(3) Level 3 requires:

(i) Knowledge of general principles, and performance of a high degree of practical application.

(ii) Development of sufficient manipulative skills to simulate return to service.

(iii) Instruction by lecture, demonstration, discussion, and a high degree of practical application.

(c) Teaching materials and equipment. The curriculum may be presented utilizing currently accepted educational materials and equipment, including, but not limited to: calculators, computers, and audio-visual equipment.

[Amdt. 147-2, 35 FR 5534, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28960, June 29, 1992]

APPENDIX B TO PART 147—GENERAL CURRICULUM SUBJECTS

This appendix lists the subjects required in at least 400 hours in general curriculum subjects.

The number in parentheses before each item listed under each subject heading indicates the level of proficiency at which that item must be taught.

Teaching level

A. BASIC ELECTRICITY

- (2) 1. Calculate and measure capacitance and inductance.
(2) 2. Calculate and measure electrical power.

- Teaching level
- (3) 3. Measure voltage, current, resistance, and continuity.
 - (3) 4. Determine the relationship of voltage, current, and resistance in electrical circuits.
 - (3) 5. Read and interpret aircraft electrical circuit diagrams, including solid state devices and logic functions.
 - (3) 6. Inspect and service batteries.
 - B. AIRCRAFT DRAWINGS
 - (2) 7. Use aircraft drawings, symbols, and system schematics.
 - (3) 8. Draw sketches of repairs and alterations.
 - (3) 9. Use blueprint information.
 - (3) 10. Use graphs and charts.
 - C. WEIGHT AND BALANCE
 - (2) 11. Weigh aircraft.
 - (3) 12. Perform complete weight-and-balance check and record data.
 - D. FLUID LINES AND FITTINGS
 - (3) 13. Fabricate and install rigid and flexible fluid lines and fittings.
 - E. MATERIALS AND PROCESSES
 - (1) 14. Identify and select appropriate nondestructive testing methods.
 - (2) 15. Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.
 - (1) 16. Perform basic heat-treating processes.
 - (3) 17. Identify and select aircraft hardware and materials.
 - (3) 18. Inspect and check welds.
 - (3) 19. Perform precision measurements.
 - F. GROUND OPERATION AND SERVICING
 - (2) 20. Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards.
 - (2) 21. Identify and select fuels.
 - G. CLEANING AND CORROSION CONTROL
 - (3) 22. Identify and select cleaning materials.
 - (3) 23. Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.
 - H. MATHEMATICS
 - (3) 24. Extract roots and raise numbers to a given power.
 - (3) 25. Determine areas and volumes of various geometrical shapes.
 - (3) 26. Solve ratio, proportion, and percentage problems.
 - (3) 27. Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.
 - I. MAINTENANCE FORMS AND RECORDS
 - (3) 28. Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.
 - (3) 29. Complete required maintenance forms, records, and inspection reports.
 - J. BASIC PHYSICS
 - (2) 30. Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.

- Teaching level
- K. MAINTENANCE PUBLICATIONS
 - (3) 31. Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.
 - (3) 32. Read technical data.
 - L. MECHANIC PRIVILEGES AND LIMITATIONS
 - (3) 33. Exercise mechanic privileges within the limitations prescribed by part 65 of this chapter.

[Amdt. 147-2, 35 FR 5534, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28960, June 29, 1992]

APPENDIX C TO PART 147—AIRFRAME CURRICULUM SUBJECTS

This appendix lists the subjects required in at least 750 hours of each airframe curriculum, in addition to at least 400 hours in general curriculum subjects.

The number in parentheses before each item listed under each subject heading indicates the level of proficiency at which that item must be taught.

I. AIRFRAME STRUCTURES

- Teaching level
- A. WOOD STRUCTURES
 - (1) 1. Service and repair wood structures.
 - (1) 2. Identify wood defects.
 - (1) 3. Inspect wood structures.
 - B. AIRCRAFT COVERING
 - (1) 4. Select and apply fabric and fiberglass covering materials.
 - (1) 5. Inspect, test, and repair fabric and fiberglass.
 - C. AIRCRAFT FINISHES
 - (1) 6. Apply trim, letters, and touchup paint.
 - (2) 7. Identify and select aircraft finishing materials.
 - (2) 8. Apply finishing materials.
 - (2) 9. Inspect finishes and identify defects.
 - D. SHEET METAL AND NON-METALLIC STRUCTURES
 - (2) 10. Select, install, and remove special fasteners for metallic, bonded, and composite structures.
 - (2) 11. Inspect bonded structures.
 - (2) 12. Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.
 - (2) 13. Inspect, check, service, and repair windows, doors, and interior furnishings.
 - (3) 14. Inspect and repair sheet-metal structures.
 - (3) 15. Install conventional rivets.
 - (3) 16. Form, lay out, and bend sheet metal.
 - E. WELDING
 - (1) 17. Weld magnesium and titanium.
 - (1) 18. Solder stainless steel.
 - (1) 19. Fabricate tubular structures.
 - (2) 20. Solder, braze, gas-weld, and arc-weld steel.
 - (1) 21. Weld aluminum and stainless steel.
 - F. ASSEMBLY AND RIGGING
 - (1) 22. Rig rotary-wing aircraft.

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I. AIRFRAME STRUCTURES—Continued

- Teaching level
- (2) 23. Rig fixed-wing aircraft.
 - (2) 24. Check alignment of structures.
 - (3) 25. Assemble aircraft components, including flight control surfaces.
 - (3) 26. Balance, rig, and inspect movable primary and secondary flight control surfaces.
 - (3) 27. Jack aircraft.
- G. AIRFRAME INSPECTION
- (3) 28. Perform airframe conformity and airworthiness inspections.

II. AIRFRAME SYSTEMS AND COMPONENTS

- Teaching level
- A. AIRCRAFT LANDING GEAR SYSTEMS
- (3) 29. Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.
- B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS
- (2) 30. Repair hydraulic and pneumatic power systems components.
 - (3) 31. Identify and select hydraulic fluids.
 - (3) 32. Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.
- C. CABIN ATMOSPHERE CONTROL SYSTEMS
- (1) 33. Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, pressurization systems, and air cycle machines.
 - (1) 34. Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.
 - (2) 35. Inspect, check, troubleshoot, service and repair oxygen systems.
- D. AIRCRAFT INSTRUMENT SYSTEMS
- (1) 36. Inspect, check, service, troubleshoot, and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position indicating systems to include the use of built-in test equipment.
 - (2) 37. Install instruments and perform a static pressure system leak test.
- E. COMMUNICATION AND NAVIGATION SYSTEMS
- (1) 38. Inspect, check, and troubleshoot autopilot, servos and approach coupling systems.
 - (1) 39. Inspect, check, and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, Radar beacon transponders, flight management computers, and GPWS.
 - (2) 40. Inspect and repair antenna and electronic equipment installations.
- F. AIRCRAFT FUEL SYSTEMS
- (1) 41. Check and service fuel dump systems.
 - (1) 42. Perform fuel management transfer, and defueling.
 - (1) 43. Inspect, check, and repair pressure fueling systems.
 - (2) 44. Repair aircraft fuel system components.
 - (2) 45. Inspect and repair fluid quantity indicating systems.
 - (2) 46. Troubleshoot, service, and repair fluid pressure and temperature warning systems.

II. AIRFRAME SYSTEMS AND COMPONENTS—Continued

- Teaching level
- (3) 47. Inspect, check, service, troubleshoot, and repair aircraft fuel systems.
- G. AIRCRAFT ELECTRICAL SYSTEMS
- (2) 48. Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.
 - (3) 49. Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.
 - (3) 50.a. Inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems.
 - (1) 50.b. Inspect, check, and troubleshoot constant speed and integrated speed drive generators.
- H. POSITION AND WARNING SYSTEMS
- (2) 51. Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.
 - (3) 52. Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.
- I. ICE AND RAIN CONTROL SYSTEMS
- (2) 53. Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.
- J. FIRE PROTECTION SYSTEMS
- (1) 54. Inspect, check, and service smoke and carbon monoxide detection systems.
 - (3) 55. Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.

[Amdt. 147-2, 35 FR 5535, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28960, June 29, 1992; Docket FAA-2017-0733, Amdt. 147-8, 82 FR 34399, July 25, 2017]

APPENDIX D TO PART 147—POWERPLANT CURRICULUM SUBJECTS

This appendix lists the subjects required in at least 750 hours of each powerplant curriculum, in addition to at least 400 hours in general curriculum subjects.

The number in parentheses before each item listed under each subject heading indicates the level of proficiency at which that item must be taught.

I. POWERPLANT THEORY AND MAINTENANCE

- Teaching level
- A. RECIPROCATING ENGINES
- (1) 1. Inspect and repair a radial engine.
 - (2) 2. Overhaul reciprocating engine.
 - (3) 3. Inspect, check, service, and repair reciprocating engines and engine installations.
 - (3) 4. Install, troubleshoot, and remove reciprocating engines.
- B. TURBINE ENGINES
- (2) 5. Overhaul turbine engine.
 - (3) 6. Inspect, check, service, and repair turbine engines and turbine engine installations.

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I. POWERPLANT THEORY AND MAINTENANCE—
Continued

- Teach-
ing
level
- (3) 7. Install, troubleshoot, and remove turbine engines.
- C. ENGINE INSPECTION
- (3) 8. Perform powerplant conformity and air worthiness inspections.

II. POWERPLANT SYSTEMS AND COMPONENTS

- Teach-
ing
level
- A. ENGINE INSTRUMENT SYSTEMS
- (2) 9. Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.
 - (3) 10. Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and r.p.m. indicating systems.
- B. ENGINE FIRE PROTECTION SYSTEMS
- (3) 11. Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
- C. ENGINE ELECTRICAL SYSTEMS
- (2) 12. Repair engine electrical system components.
 - (3) 13. Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.
- D. LUBRICATION SYSTEMS
- (2) 14. Identify and select lubricants.
 - (2) 15. Repair engine lubrication system components.
 - (3) 16. Inspect, check, service, troubleshoot, and repair engine lubrication systems.
- E. IGNITION AND STARTING SYSTEMS
- (2) 17. Overhaul magneto and ignition harness.
 - (2) 18. Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components.
 - (3) 19.a. Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.
 - (1) 19.b. Inspect, service, and troubleshoot turbine engine pneumatic starting systems.
- F. FUEL METERING SYSTEMS
- (1) 20. Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls.
 - (2) 21. Overhaul carburetor.
 - (2) 22. Repair engine fuel metering system components.
 - (3) 23. Inspect, check, service, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.

II. POWERPLANT SYSTEMS AND COMPONENTS—
Continued

- Teach-
ing
level
- G. ENGINE FUEL SYSTEMS
- (2) 24. Repair engine fuel system components.
 - (3) 25. Inspect, check, service, troubleshoot, and repair engine fuel systems.
- H. INDUCTION AND ENGINE AIRFLOW SYSTEMS
- (2) 26. Inspect, check, troubleshoot, service, and repair engine ice and rain control systems.
 - (1) 27. Inspect, check, service, troubleshoot and repair heat exchangers, superchargers, and turbine engine airflow and temperature control systems.
 - (3) 28. Inspect, check, service, and repair carburetor air intake and induction manifolds.
- I. ENGINE COOLING SYSTEMS
- (2) 29. Repair engine cooling system components.
 - (3) 30. Inspect, check, troubleshoot, service, and repair engine cooling systems.
- J. ENGINE EXHAUST AND REVERSER SYSTEMS
- (2) 31. Repair engine exhaust system components.
 - (3) 32.a. Inspect, check, troubleshoot, service, and repair engine exhaust systems.
 - (1) 32.b. Troubleshoot and repair engine thrust reverser systems and related components.
- K. PROPELLERS
- (1) 33. Inspect, check, service, and repair propeller synchronizing and ice control systems.
 - (2) 34. Identify and select propeller lubricants.
 - (1) 35. Balance propellers.
 - (2) 36. Repair propeller control system components.
 - (3) 37. Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.
 - (3) 38. Install, troubleshoot, and remove propellers.
 - (3) 39. Repair aluminum alloy propeller blades.
- L. UNDUCTED FANS
- (1) 40. Inspect and troubleshoot unducted fan systems and components.
- M. AUXILIARY POWER UNITS
- (1) 41. Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.

(Sec. 6(c), Dept. of Transportation Act; 49 U.S.C. 1655(c))

[Amdt. 147-2, 35 FR 5535, Apr. 3, 1970, as amended by Amdt. 147-5, 57 FR 28961, June 29, 1992]