



## **YEMEN CIVIL AVIATION REGULATIONS (YCARs) YCAR PART II**

### **CHAPTER – 9 - MAINTENANCE TRAINING ORGANIZATIONS**

**ISSUE HISTORY AND DATE OF APPLICABILITY**

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## CHAPTER - 9

### 9. MAINTENANCE TRAINING ORGANIZATIONS (MTO)

#### 9.1. GENERAL

##### 9.1.1. Applicability

This chapter prescribes the requirements for issuing Maintenance Training Organization (MTO) approval certificates and associated ratings and the general operating rules for the holders of those approval certificates and ratings.

##### 9.1.2. Approval certificate required

No person may operate as a certificated maintenance training organization without, or in violation of, a maintenance training organization approval certificate issued under this chapter.

##### 9.1.3. Application and issue

- (a) An application for an approval certificate and rating, or for an additional rating, under this chapter is made on a form and in a manner prescribed by the CAMA, 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 approval certificate and ratings held and the approval 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 chapter is entitled to a maintenance training organization approval certificate and associated ratings prescribing such operations specifications and limitations as are necessary in the interests of safety.

##### 9.1.4. Duration of approval certificates

- (a) Unless sooner surrendered, suspended, or revoked, a maintenance training organization approval certificate or rating(s) expires:
  - (1) At the end of the twelve month, after the month in which it was issued or renewed; or
  - (2) Upon notice from the CAMA that for more than 60 days the MTO has failed to maintain requirements prescribed in this chapter, as amended for certification.
- (b) The holder of a maintenance training organization approval certificate may not make any change in the MTO's location unless the change is approved in advance.

#### 9.2. CERTIFICATION REQUIREMENTS

##### 9.2.1. Ratings

The following ratings are issued under this chapter:

- (a) Airframe.
- (b) Power plant.
- (c) Airframe and power plant.
- (d) Avionics.

(e) Other courses as the CAMA may approve.

### **9.2.2. Facilities, equipment, and material requirement**

An applicant for a maintenance training organization approval certificate and rating, or for an additional rating, shall have at least the facilities, equipment, and materials specified in 9.2.3 to 9.2.5 that are appropriate to the rating he seeks.

### **9.2.3. Space requirement**

An applicant for a maintenance training organization approval certificate and rating, or for an additional rating, shall have such of the following properly heated, lighted, and ventilated facilities as are appropriate to the rating he seeks and as the CAMA determines 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 wash tank 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, and avionics equipment 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.

### **9.2.4. Instructional equipment requirements**

- (a) An applicant for a maintenance training organization approval certificate and rating, or for an additional rating, shall 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 CAMA for private or commercial operation, with powerplant, propeller, instruments, navigation and communications equipment, landing lights, and other equipment and accessories on which a maintenance engineer might be required to work and with which the technician should be familiar.
- (b) The equipment required by paragraph (a) of this subsection need not be in an airworthy condition. However, if it was damaged, it shall 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,

shall be so diversified as to show the different methods of construction, assembly, inspection, and operation when installed in an aircraft for use. There shall 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 MTO shall provide training aids, or operational mock-ups of them.

#### **9.2.5. Materials, special tools, and shop equipment requirements**

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

#### **9.2.6. General curriculum requirements**

- (a) An applicant for a maintenance training organization approval certificate and rating, or for an additional rating, shall have an approved curriculum that is designed to qualify his students to perform the duties of an aircraft maintenance engineer for a particular rating or ratings.
- (b) The curriculum shall 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).
  - (4) Avionics
- (c) The curriculum shall cover the subjects and items prescribed in appendixes B, C, or D, as applicable. Each item shall be taught to at least the indicated level of proficiency, as defined in appendix A.
- (d) The curriculum shall 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 MTO tests to be given.
- (e) Notwithstanding the provisions of paragraphs (a) through (d) of this subsection and 9.3.11, the holder of an approval certificate issued under section B of this chapter 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 YCARs. The MTO may also issue certificates of competency to persons successfully completing such courses provided that all other requirements of this chapter are met and the certificate of competency specifies the aircraft make and model to which the certificate applies.

#### **9.2.7. Instructor requirements**

An applicant for a maintenance training organization approval certificate and rating, or for an additional rating, shall provide the number of qualified instructors holding appropriate AME License and ratings that the CAMA determines necessary to provide adequate instruction and supervision of the students, including at least one such instructor for each 25 students in each shop class. The applicant is required to maintain a list of the names and qualifications of specialized instructors, and

upon request, provide copy of the list to the CAMA.

(a) Approval requirements:

- (1) The training organization shall ensure that all instructional personnel receive initial and continuation training appropriate to their assigned tasks and responsibilities. The training programme established by the training organization shall include approval training procedure and training in knowledge and skills related to human performance.
- (2) He shall have had a License issued in any civil aviation field;
- (3) He shall have accomplished the specific training related to the subjects he aims to teach;
- (4) The training department shall submit an application for approval of the instructor, using the appropriate form issued by the CAMA, along with all the official documents required before conducting any training activity requiring approval;
- (5) The applicant shall be given, within two weeks of submitting the application with the CAMA, the requirements to issue the approval;
- (6) Upon fulfilling all the requirements, the instructor will be allowed to teach a course once under the supervision of approved civil aviation inspectors;
- (7) If his skills do not meet CAMA standards he will be notified that he did not meet the standards. He will be allowed to teach one class and if he again fails to meet CAMA standards, his request for approval will be denied;
- (8) If his performance meets CAMA standards then an instructor approval valid for one year will be issued to him; and
- (9) When an approved instructor receives any approved specific course, his training department can add it to his instructor approval.

(b) Maintenance of instructor requirements:

- (1) If any major change occurs in the teaching technique, adopted in the instructor's field of specialization, he shall notify the CAMA with the change at least 3 weeks in advance, using the appropriate form issued by the CAMA;
- (2) Two weeks before the expiration date of his approval, he shall submit an application for renewal, using the appropriate form issued by the CAMA;
- (3) His average evaluation report issued by the CAMA during his approval validity period shall meet CAMA standards, otherwise he will be notified of the CAMA requirements, and allowed a period of time to fulfill them. If he fails to meet the CAMA requirements, his approval will be revoked either completely or partially according to the situation; and
- (4) Each certificated maintenance training organization shall, after certification or addition of a training specification, continue to provide the number of instructors holding appropriate Aircraft Maintenance Engineer Licenses and training specifications that the CAMA determines necessary to provide adequate instruction to the students

### **9.3. OPERATING RULES**

#### **9.3.1. Attendance and enrollment, tests, and credit for prior instruction or experience**

- (a) A certificated maintenance training organization 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 MTO shall give an appropriate test to each student who completes a unit of instruction as shown in that MTO's approved curriculum.
- (c) A MTO may not graduate a student unless he has completed all of the appropriate

curriculum requirements. However, the MTO may credit a student with instruction or previous experience as follows:

- (1) A MTO 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 maintenance training organization.
- (2) MTO 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 MTO;
  - (ii) By an evaluation of an authenticated transcript from the student's former MTO; or
  - (iii) In the case of an applicant from a military school, only on the basis of an entrance test.
- (3) A MTO may credit a student with previous aviation maintenance experience comparable to required curriculum subjects. It shall 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 MTO.
- (4) A MTO may credit a student seeking an additional rating with previous satisfactory completion of the general portion of an AMTS curriculum.
- (d) A MTO may not have more students enrolled than the number stated in its application for an approval certificate, unless it amends its application and has it approved.
- (e) A MTO shall use an approved system for determining final course grades and for recording student attendance. The system shall show hours of absence allowed and show how the missed material will be made available to the student.

### **9.3.2. Records**

- (a) Each certificated maintenance training organization shall keep a current record of each student enrolled, showing;
  - (1) His attendance, tests, and grades received on the subjects required by this chapter;
  - (2) The instruction credited to him under 9.3.1(c), if any; and
  - (3) The authenticated transcript of his grades from that MTO.

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 CAMA during that period.

- (b) Each MTO 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.

### **9.3.3. Transcripts and graduation certificates**

- (a) Upon request, each certificated maintenance training organization shall provide a transcript of the student's grades to each student who is graduated from that MTO or who leaves it before being graduated. An official of the MTO shall authenticate the transcript. The transcript shall 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 MTO shall give a graduation certificate or certificate of completion to each student that it graduates. An official of the MTO shall authenticate the certificate. The certificate shall show the date of graduation and the approved curriculum title.

#### **9.3.4. Maintenance of instructor requirements**

Each certificated maintenance training organization shall, after certification or addition of a rating, continue to provide the number of instructors holding appropriate Aircraft Maintenance Engineer Licenses and ratings that the CAMA determines necessary to provide adequate instruction to the students, including at least one such instructor for each 25 students in each shop class. The MTO may continue to provide specialized instructors who are not licensed Aircraft Maintenance Engineers to teach mathematics, physics, drawing, basic electricity, basic hydraulics, and similar subjects.

#### **9.3.5. Maintenance of facilities, equipment, and material**

- (a) Each certificated maintenance training organization 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 MTO 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.

#### **9.3.6. Maintenance of curriculum requirements**

- (a) Each certificated maintenance training organization shall adhere to its approved curriculum. With CAMA approval, curriculum subjects may be taught at levels exceeding those shown in appendix A of Chapter 9.
- (b) A MTO may not change its approved curriculum unless the change is approved in advance.

#### **9.3.7. Quality of instruction**

Each certificated maintenance training organization shall provide instruction of such quality that, of its graduates of a curriculum for each rating who apply for an aircraft Maintenance Engineer License or additional rating within 60 days after they are graduated, the percentage of those passing the applicable CAMA knowledge written tests on their first attempt during any period of 12 calendar months is at least the percentage figured as follows:

- (a) For a MTO graduating fewer than 51 students during that period; the national passing norm minus the number 20.
- (b) For a MTO graduating at least 51, but fewer than 201, students during that period; the national passing norm minus the number 15.
- (c) For a MTO graduating more than 200 students during that period; the national passing norm minus the number 10.

As used in this subsection, "national passing norm" is the number representing the percentage of all graduates (of a curriculum for a particular rating) of all certificated maintenance training organizations who apply for an aircraft Maintenance Engineer License or additional rating within 60 days after they are graduated and pass the applicable CAMA knowledge written tests on their first attempt during the period of 12 calendar months described in this subsection.

#### **9.3.8. Display of approval certificate**

Each holder of a maintenance training organization approval certificate and ratings shall display them at a place in the MTO that is normally accessible to the public and is not obscured. The approval certificate shall be available for inspection by the CAMA.

### **9.3.9. Change of location**

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

### **9.3.10. Inspection**

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

### **9.3.11. Advertising**

- (a) A certificated maintenance training organization may not make any statement relating to itself that is false or is designed to mislead any person considering enrollment therein.
- (b) Whenever a maintenance training organization indicates in advertising that it is a certificated MTO, it shall clearly distinguish between its approved courses and those that are not approved.

## APPENDIX – A-CURRICULUM REQUIREMENTS

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

## APPENDIX – B - 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 shall be taught.

Teaching level	A. BASIC ELECTRICITY
(2)	1. Calculate and measure capacitance and inductance.
(2)	2. Calculate and measure electrical power.
(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>B. AIRCRAFT DRAWINGS</b>	
(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.
<b>C. WEIGHT AND BALANCE</b>	
(2)	11. Weigh aircraft.
(3)	12. Perform complete weight-and-balance check and record data.
<b>D. Fluid lines and fittings</b>	
(3)	13. Fabricate and install rigid and flexible fluid lines and fittings.
<b>E. MATERIALS AND PROCESSES</b>	
(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
<b>F. GROUND OPERATION AND SERVICING</b>	
(2)	20. Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards.
(2)	21. Identify and select fuels.
<b>G. CLEANING AND CORROSION CONTROL</b>	
(3)	22. Identify and select cleaning materials.
(3)	23. Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.

**H. MATHEMATICS**

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|-----|--|
| (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**

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|-----|--|
| (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**

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|-----|---|
| (2) | 30. Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight. |
|-----|---|

**K. MAINTENANCE PUBLICATIONS**

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|-----|--|
| (3) | 31. Demonstrate ability to read, comprehend, and apply information contained in CAMA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related YCARs, Airworthiness Directives, and Advisory material. |
| (3) | 32. Read technical data.   |

**L. AIRCRAFT MAINTENANCE ENGINEER PRIVILEGES AND LIMITATIONS**

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|-----|---|
| (3) | 33. Exercise an aircraft maintenance engineer privileges within the limitations prescribed by this chapter. |
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## APPENDIX – C- 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 shall be taught.

### I. AIRFRAME STRUCTURES

Teaching level	A. WOOD STRUCTURES
(1)	1. Service and repair wood
(1)	2. Identify wood defects.
(1)	3. Inspect wood structures.
<b>B. Aircraft covering</b>	
(1)	4. Select and apply fabric and fiberglass covering materials.
(1)	5. Inspect, test, and repair fabric and fiberglass.
<b>C. AIRCRAFT FINISHES</b>	
(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
<b>D. SHEET METAL AND NON-METALLIC STRUCTURES</b>	
(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.
<b>E. WELDING</b>	
(1)	17. Weld magnesium and
(1)	18. Solder stainless steel.
(1)	19. Fabricate tubular
(2)	20. Solder, braze, gas-weld, and arc-weld steel.
(1)	21. Weld aluminum and

<b>F. ASSEMBLY AND RIGGING</b>	
(1)	22. Rig rotary-wing aircraft.
(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.
<b>G. AIRFRAME INSPECTION</b>	
(3)	28. Perform airframe conformity and airworthiness inspections.

## **II. AIRFRAME SYSTEMS AND COMPONENTS**

Teaching level	<b>A. AIRCRAFT LANDING GEAR SYSTEMS</b>
(3)	29. Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.
<b>B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS</b>	
(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.
<b>C. CABIN ATMOSPHERE CONTROL SYSTEMS</b>	
(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.
<b>D. AIRCRAFT INSTRUMENT SYSTEMS</b>	
(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.
<b>E. COMMUNICATION AND NAVIGATION SYSTEMS</b>	
(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, LORAN, Radar beacon transponders, flight management computers, and GPWS.
(2)	40. Inspect and repair antenna and electronic equipment installations.
<b>F. AIRCRAFT FUEL SYSTEMS</b>	
(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.
(3)	47. Inspect, check, service, troubleshoot, and repair aircraft fuel systems.
<b>G. AIRCRAFT ELECTRICAL SYSTEMS</b>	
(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.
<b>H. POSITION AND WARNING SYSTEMS</b>	
(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.
<b>I. ICE AND RAIN CONTROL SYSTEMS</b>	
(2)	53. Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.
<b>J. FIRE PROTECTION SYSTEMS</b>	
(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.

## APPENDIX – D -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 shall 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>B. TURBINE ENGINES</b>	
(2)	5. Overhaul turbine engine.
(3)	6. Inspect, check, service, and repair turbine engines and turbine engine installations.
(3)	7. Install, troubleshoot, and remove turbine engines.
<b>C. ENGINE INSPECTION</b>	
(3)	8. Perform powerplant conformity and air worthiness inspections.

### II. POWERPLANT SYSTEMS AND COMPONENTS

Teaching 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>B. ENGINE FIRE PROTECTION SYSTEMS</b>	
(3)	11. Inspect, check, service, troubleshoot, and repair engine fire detection and extinguishing systems.
<b>C. ENGINE ELECTRICAL SYSTEMS</b>	
(2)	12. Repair engine electrical system components.
(3)	13. Install, check, and service engine electrical wiring, controls, switches, indicators, and protective devices.
<b>D. LUBRICATION SYSTEMS</b>	
(2)	14. Identify and select lubricants.
(2)	15. Repair engine lubrication system components.
(3)	16. Inspect, check, service, troubleshoot, and repair engine lubrication systems.
<b>E. IGNITION AND STARTING SYSTEMS</b>	
(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.
<b>F. FUEL METERING SYSTEMS</b>	
(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.
<b>G. ENGINE FUEL SYSTEMS</b>	
(2)	24. Repair engine fuel system components.
(3)	25. Inspect, check, service, troubleshoot, and repair engine fuel systems.
<b>H. INDUCTION AND ENGINE AIRFLOW SYSTEMS</b>	
(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.
<b>I. ENGINE COOLING SYSTEMS</b>	
(2)	29. Repair engine cooling system components.
(3)	30. Inspect, check, troubleshoot, service, and repair engine cooling systems.
<b>J. ENGINE EXHAUST AND REVERSER SYSTEMS</b>	
(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.
<b>K. PROPELLERS</b>	
(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.
<b>L. UNDUCTED FANS</b>	
(1)	40. Inspect and troubleshoot unducted fan systems and components.
<b>M. AUXILIARY POWER UNITS</b>	
(1)	41. Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.