



SIERRA LEONE CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR

SLCAA-AC-PEL041-Rev. 00

EFFECTIVE DATE: 31st JULY 2021

Aircraft Maintenance Engineer Powerplant Skill Test

Director General
Sierra Leone Civil Aviation Authority

TABLE OF CONTENTS

FORWARD 1

SECTION ONE: INSTRUCTIONS 2

1.1 GENERAL3

1.2 PURPOSE3

1.3 SKILL TEST STANDARD CONCEPT3

1.4 SKILL TEST DESCRIPTION3

1.5 USE OF THE SKILL TEST STANDARDS5

1.6 SKILL TEST PREREQUISITES5

1.7 EXAMINER RESPONSIBILITY6

1.8 PERFORMANCE LEVELS6

1.9 SATISFACTORY PERFORMANCE6

1.10 UNSATISFACTORY PERFORMANCE7

**SECTION TWO: AVIATION MAINTENANCE TECHNICIAN LICENCE
POWERPLANT SKILL TEST STANDARDS 8**

1.1 AREAS OF OPERATIONS.....9

**SECTION THREE: POWERPLANT SYSTEMS AND COMPONENTS SKILL TEST
STANDARDS 11**

1.1 AREAS OF OPERATION12

FORWARD

The Sierra Leone Civil Aviation Authority (SLCAA) has developed skill test standards for airmen licences and ratings and these are published as Advisory Circulars (ACs). This AC establishes the standards for the Aircraft Maintenance Engineer licence skill tests for Powerplant. Sierra Leone inspectors and designated aircraft maintenance engineer examiners shall conduct skill tests in compliance with these standards. Aircraft Maintenance Engineer instructors and applicants should find these standards helpful in skill test preparation. Other ACs have been developed for other airmen licences and can be obtained from the SLCAA website: <http://www.slcaa.gov.sl>

Information considered directive in nature is described in this skill test AC in terms such as “shall” and “must”, indicating the actions are mandatory. Guidance information is described in terms such as “should” and “may” indicating the actions are desirable or permissive, but not mandatory.

The Sierra Leone Civil Aviation Regulations (SLCARs) can be obtained from the SLCAA at the address listed below. SLCARs Part 1A covers the requirements for personnel licensing.

This Skill Test Standard may be downloaded from the SLCAA website at <http://www.slcaa.gov.sl> Subsequent changes to the Skill Test Standard will also be available on the SLCAA web site.

Comments regarding this publication should be sent to:

Sierra Leone Civil Aviation Authority
3rd Floor NDB Building
21/23, Siaka Stevens Street
Freetown, Sierra Leone

SECTION ONE: INSTRUCTIONS

1.1 GENERAL

The SLCAA has developed this skill test AC as the standard that shall be used by SLCAA inspectors and designated mechanic examiners when conducting AMTL – Powerplant Skill Tests. Instructors are expected to use this document when preparing applicants for skill tests. Applicants should be familiar with this document and refer to these standards during their training.

1.2 PURPOSE

The purpose of this AC is to prescribe the standards that shall be used by SLCAA inspectors and designated mechanic examiners when conducting an Aviation Maintenance Technician Licence (AMTL) – Powerplant Skill Test. Instructors are expected to use this document when preparing applicants for skill tests. Applicants should be familiar with this document and refer to these standards during their training.

1.3 SKILL TEST STANDARD CONCEPT

- (1) SLCAR Part 1A specifies the areas in which knowledge and skill must be demonstrated by the applicant before the issuance of a licence or rating. SLCARs provide the flexibility to permit the SLCAA to publish skill test standards (STSs) containing the AREAS OF OPERATION and specific TASKS in which competency shall be evaluated. “Knowledge” (oral) elements are indicated by use of the words “Exhibits knowledge of...” “Skill” (practical) elements are indicated by the use of the words “Demonstrates the ability to...”
- (2) The SLCAA will revise this STS whenever it is determined that changes are needed in the interest of safety. Adherence to the provisions of the regulations and the STS is mandatory for evaluation of aviation maintenance technician applicants.
- (3) The STS contains sections. The first section contains the directions and other relevant information for the conduct of the skill test. The subsequent sections contain the areas of operation for each skill test. Within the areas of operation are subject area elements, which contain individual TASKS. Some elements are labelled as core competency elements, which mean that the entire element must be completed by the applicant.

1.4 SKILL TEST DESCRIPTION

- (1) The Aviation Maintenance Technician Licence – Airframe STS include the subject areas of knowledge and skill for the issuance of an aviation maintenance licence. The subject areas are the topics in which aviation maintenance technician licence applicants must have knowledge and/or demonstrate skill.
- (2) REFERENCE identifies the publication(s) that describe(s) the subject area. Descriptions of the subject area are not included in the skill test standards, because this information can be found in references listed and/or in manufacturer- or SLCAA-approved or acceptable data related to each subject area. Publications other than those listed may be used as references if their content conveys substantially the same information as the referenced publications. Except where appropriate (e.g., pertinent SLCARs), references listed in this document are NOT meant to supersede or otherwise replace manufacturer- or other SLCAA-approved or acceptable data, but to serve as general information and study material sources. Information contained in manufacturer and/ or SLCAA-approved/acceptable data

always takes precedence over advisory or textbook referenced data. Written instructions given to applicants for the completion of assigned skill portions of the skill test standard may include service bulletins, Airworthiness Directives, SLCAR Parts, type certificate data sheets or specifications, manufacturer maintenance manuals, and other similar approved/acceptable data necessary for accomplishment of objective testing.

SLCARs Part 1A	Personnel Licensing
SLCARs Parts 6A	Operations
SLCARs Part 8	Airworthiness
SLCARs Part 22	General Policies, Procedures, and Definitions
SLCARs Part 25	Instruments and Equipment
SLCARs Part 26	Air Operator Certification
RESERVED	
RESERVED	
RESERVED	
RESERVED	
RESERVED	
RESERVED	

- (3) Each subject area has an OBJECTIVE. The OBJECTIVE lists the important knowledge and skill elements that must be utilised by the examiner in planning and administering aviation mechanic tests and that applicants must be prepared to satisfactorily perform.
- (4) EXAMINER is used in this standard to denote either the SLCAA inspector or SLCAA designated mechanic examiner (DME) who conducts the skill test.
- (5) The following abbreviations have the meanings shown:

ADF	Automatic Direction Finder
ADM	Aeronautical Decision Making
AIRMETS	Airman’s Meteorological Information
APV	Approach with Vertical Guidance
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATS	Air Traffic Service
SLCARS	Sierra Leone Civil Aviation Regulations
CDI	Course Deviation Indicator
CFIT	Controlled Flight into Terrain
CRM	Crew Resource Management
DA	Decision Altitude
DH	Decision Height
DME	Distance Measuring Equipment
DP	Departure Procedure
FDC	Flight Data Center
FMS	Flight Management System
FSTD	Flight Simulation Training Device
GLS	GNSS Landing System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System

GPWS	Ground Proximity Warning System
IAP	Instrument Approach Procedure
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IPC	Instrument Proficiency Check
LAHSO	Land and Hold Short Operations
LCD	Liquid Crystal Display
LDA	Localizer-type Directional Aid
LED	Light Emitting Diode
LOC	ILS Localizer
LORAN	Long Range Navigation
MAP	Missed Approach Point
ACA	Minimum Descent Attitude
METAR	Aviation Routine Weather Report
MLS	Microwave Landing System
NAVAID	Navigational Aid
NDB	Non-Directional Beacon
NOTAM	Notice to Airmen
NPA	Non-precision Approach
PA	Precision Approach
RAIM	Receiver Autonomous Integrity Monitoring
RMI	Radio Magnetic Indicator
RNAV	Area navigation
SAS	Stability Augmentation System
SDF	Simplified Directional Facility
SIGMETS	Significant Meteorological Advisory
SRM	Single Pilot Resource Management
STAR	Standard Terminal Arrival
STS	Skill Test Standards
TCAS	Traffic Alert and Collision Avoidance System
VDP	Visual Descent Point
VHF	Very High Frequency
VNAV	Vertical Navigation
VOR	Very High Frequency Ominidirectional Range

1.5 USE OF THE SKILL TEST STANDARDS

- (1) The SLCAA requires that all skill tests be conducted in accordance with the appropriate STS. When conducting the skill test, the examiner must evaluate the applicants knowledge and skill in sufficient depth to determine that the OBJECTIVE for each subject area ELEMENT selected is met.
- (2) An applicant is not permitted to know before testing begins which selections in each subject area are to be included in his or her test (except the core competency elements, which all applicants are required to perform). Therefore, an applicant should be well prepared in all oral and skill areas included in the skill test standard.

1.6 SKILL TEST PREREQUISITES

An applicant for an AMTL – Powerplant Skill Test is required to meet the applicable experience requirements in SLCAR Part 1A for an aviation maintenance technician licence and the rating(s) sought.

1.7 EXAMINER RESPONSIBILITY

The examiner who conducts the skill test is responsible for determining that the applicant meets acceptable standards of knowledge and skill in the assigned subject areas within the appropriate skill test standard. Since there is no formal division between the knowledge and skill portions of the skill test, this becomes an ongoing process throughout the test. The following terms may be reviewed with the applicant prior to, or during, element assignment:

1. “Inspect” means to examine by sight and/or touch (with or without inspection enhancing tools/equipment)
2. “Check” means to verify proper operation
3. “Troubleshoot” means to analyse and identify malfunctions
4. “Service” means to perform functions that ensure continued operation
5. “Repair” means to correct a defective condition

1.8 PERFORMANCE LEVELS

The following is a detailed description of the meaning of each level.

(1) Level 1

- (a) Know basic facts and principles
- (b) Be able to find information and follow directions and written instructions
- (c) Locate methods, procedures, instructions, and reference material
- (d) Interpretation of information is not required
- (e) No skill demonstration is required

EXAMPLE: Z3b. Locate specified non-destructive testing methods. (Level 1)

Performance Standard: The applicant will locate information for non-destructive testing.

(2) Level 2

- (a) Know and understand principles, theories, and concepts
- (b) Be able to find and interpret maintenance data and information and perform basic operations using the appropriate data, tools, and equipment
- (c) A high level of skill is not required

EXAMPLE: Z3c. Detect electrical leakage in electrical connections, terminal strips, and cable harness (at least ten will have leakage faults). (Level 2)

Performance Standard: Using appropriate maintenance data and a multimeter, the applicant will identify items with leakage faults.

(3) Level 3

- (a) Know, understand, and apply facts, principles, theories, and concepts.
- (b) Understand how they relate to the total operation and maintenance of aircraft.
- (c) Be able to make independent and accurate airworthiness judgements.
- (d) Perform all skill operations to a return-to-service standard using appropriate data, tools, and equipment. Inspections are performed in accordance with acceptable or approved data.
- (e) A fairly high skill level is required.

EXAMPLE: Z3e. Check control surface travel. (Level 3)

Performance Standard: Using type certificate data sheets and the manufacturer’s service manual, the applicant will measure the control surface travel, compare the travel to the maintenance data, and determine if the travel is within limits.

1.9 SATISFACTORY PERFORMANCE

The skill test is passed if the applicant demonstrates the prescribed proficiency in the assigned elements (core competency and other selected elements) in each

subject area to the required standard. Applicants shall not be expected to memorise all mathematical formulas that may be required in the performance of various elements in this skill test standard. However, where relevant, applicants must be able to locate and apply necessary formulas to obtain correct solutions.

1.10 UNSATISFACTORY PERFORMANCE

If the applicant does not meet the standards of any of the elements performed (knowledge, core competency, or other skill elements), the associated subject area is failed, and thus, the skill test is failed.

The examiner or the applicant may discontinue testing any time after the failure of a subject area. In any case, the applicant is entitled to credit for only those subject areas satisfactorily completed.

Typical areas of unsatisfactory performance and grounds for disqualification include the following:

- (1) Any action or lack of action by the applicant that requires corrective intervention by the examiner for reasons of safety
- (2) Failure to follow acceptable or approved maintenance procedures while performing skill (practical) projects
- (3) Exceeding tolerances stated in the maintenance instructions
- (4) Failure to recognise improper procedures
- (5) The inability to perform to a return-to-service standard, where applicable.
- (6) Inadequate knowledge in any of the subject areas

**SECTION TWO: AVIATION MAINTENANCE TECHNICIAN LICENCE
POWERPLANT SKILL TEST STANDARDS**

1.1 AREAS OF OPERATIONS

A. AREA OF OPERATION: RECIPROCATING ENGINES

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Reciprocating engine theory of operation.
 - (b) Basic radial engine design, components, and/or operation.
 - (c) Firing order of a reciprocating engine.
 - (d) Probable cause and removal of a hydraulic lock.
 - (e) Valve adjustment on a radial engine.
 - (f) Purpose of master and/or articulating rods.
 - (g) Checks necessary to verify proper operation of a reciprocating engine.
 - (h) Induction system leak indications.
 - (i) Reciprocating engine maintenance procedures.
 - (j) Procedures for inspecting various engine components during an overhaul.
 - (k) Correct installation of piston rings and results of incorrectly installed or worn rings.
 - (l) Purpose/function/operation of various reciprocating engine components, including, but not limited to, any of the following: crankshaft dynamic dampers, multiple springs for valves, piston rings, and reduction gearing.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Measure the valve clearance on a reciprocating aircraft engine when the lifters are deflated. (Level 2)
 - (b) Accomplish a compression test, and note all findings. (Level 3)
 - (c) Inspect engine control cables and/ or push-pull tubes for proper rigging. (Level 3)
 - (d) Inspect ring gap, install piston rings on a piston, and install an aircraft engine cylinder.
 - (e) (Level 3)
 - (f) Dimensionally inspect an aircraft engine component. (Level 3)
 - (g) Replace/install one or more aircraft engine components. (Level 3)

B. AREA OF OPERATION: TURBINE ENGINES

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Turbine engine theory of operation.
 - (b) Checks necessary to verify proper operation.
 - (c) Turbine engine troubleshooting procedures.
 - (d) Procedures required after the installation of a turbine engine.
 - (e) Causes for turbine engine performance loss.
 - (f) Purpose/function/operation of various turbine engine components.
 - (g) Turbine engine maintenance procedures.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Repair a turbine engine compressor blade by blending. (Level 3)
 - (b) Remove and/or install a turbine engine component. (Level 3)
 - (c) Determine cycle life remaining between overhaul of a turbine engine life limited component. (Level 2)

- (d) Check rigging of a turbine engine inlet guide vane system. (Level 3)
- (e) Measure compressor or turbine blade clearance. (Level 3)
- (f) Troubleshoot a turbine engine. (Level 3)
- (g) Locate and identify turbine engine components. (Level 2)
- (h) Inspect turbine engine components. (Level 3)

Note: T. AUXILIARY POWER UNITS may be tested at the same time as AREA B. No further testing of auxiliary power units is required.

C. AREA OF OPERATION: ENGINE INSPECTION

References: SLCAR Part 8

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) The use of a type certificate data sheet (TCDS) to identify engine accessories.
 - (b) Requirements for the installation or modification in accordance with a supplemental type certificate (STC).
 - (c) Procedures for accomplishing a 100-hour inspection in accordance with the manufacturers instruction.
 - (d) Compliance with airworthiness directives.
 - (e) Changes to an inspection program due to a change or modification required by airworthiness directive or service bulletin.
 - (f) Determination of life limited parts.
 - (g) Inspection required after a potentially damaging event, including but not limited to any of the following: sudden stoppage, overspeed, or over temperature.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform inspection of a reciprocating and/or turbine engine installation in accordance with the manufacturer instructions. (Level 3)
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Inspect a turbine engine using a bore scope. (Level 3)
 - (b) Determine proper crankshaft flange run-out. (Level 3)
 - (c) Inspect an engine in accordance with applicable airworthiness directive. (Level 2)
 - (d) Inspect a turbine engine compressor section. (Level 3)
 - (e) Inspect a crankcase for cracks. (Level 3)
 - (f) Inspect a crankshaft oil seal for leaks. (Level 3)
 - (g) Engine conformity inspection. (Level 3)
 - (h) Engine airworthiness inspection. (Level 3)

D. Reserved

E. Reserved

F. Reserved

G. Reserved

**SECTION THREE: POWERPLANT SYSTEMS AND COMPONENTS SKILL TEST
STANDARDS**

1.1 AREAS OF OPERATION

A. AREA OF OPERATION: ENGINE INSTRUMENT SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Troubleshoot a fuel flow and/or low fuel pressure indicating system.
 - (b) The operation of a fuel flow indicating system and where it is connected to the engine.
 - (c) The operation of a temperature indicating system.
 - (d) The operation of a pressure indicating system.
 - (e) The operation of an RPM indicating system.
 - (f) Required checks to verify proper operation of a temperature indicating system.
 - (g) Required checks to verify proper operation of a pressure indicating system.
 - (h) Required checks to verify proper operation of an RPM indicating system.
 - (i) The operation of a manifold pressure gage and where it actually connects to an engine.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform inspection of engine electrical and/or mechanical instrument systems to include at least one of the following (Level 3): TASKS:
 - (a) Temperature
 - (b) Pressure
 - (c) RPM
 - (d) Rate of flow
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Verify proper operation and marking of an indicating system. (Level 2)
 - (b) Replace a temperature sending unit. (Level 3)
 - (c) Remove, inspect, and install fuel flow transmitter. (Level 3)
 - (d) Troubleshoot an oil pressure indicating system. (Level 3)
 - (e) Locate and inspect fuel flow components on an engine. (Level 2)
 - (f) Replace an exhaust gas temperature (EGT) indication probe. (Level 3)
 - (g) Troubleshoot a manifold pressure gage that is slow to indicate the correct reading. (Level 2)

B. AREA OF OPERATION: ENGINE FIRE PROTECTION SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Checks to verify proper operation of an engine fire detection and/or extinguishing system.
 - (b) Troubleshoots an engine fire detection and/or extinguishing system.
 - (c) Inspection requirements for an engine fire extinguisher squib and safety practices/precautions.
 - (d) Components and/or operation of an engine fire detection and/or extinguishing system.
 - (e) Engine fire detection and/or extinguishing system maintenance procedures.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Check an engine fire detection and/or extinguishing system for proper operation. (Level 2)

- (b) Accomplish weight and pressure inspection of an engine fire bottle, and verify hydrostatic inspection date. (Level 2)
- (c) Repair an engine fire detector heat sensing loop malfunction. (Level 3)
- (d) Check operation of firewall shut-off valve after a fire handle is pulled. (Level 2)
- (e) Troubleshoot an engine fire detection or extinguishing system. (Level 2)
- (f) Inspect an engine fire detection or extinguishing system. (Level 2)

C. ENGINE ELECTRICAL SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Generator rating and performance data location.
 - (b) Operation of a turbine engine starter-generator.
 - (c) The procedure for locating the correct electrical cable/wire size needed to fabricate a replacement cable/wire.
 - (d) Installation practices for wires running close to exhaust stacks or heating ducts.
 - (e) Operation of engine electrical system components.
 - (f) Types of and/or components of D.C. motors.
 - (g) Inspection and/or replacement of starter-generator brushes.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Flash a generator field. (Level 3)
 - (b) Install an engine driven generator or alternator. (Level 3)
 - (c) Use of an engine electrical wiring schematic. (Level 2)
 - (d) Accomplish the installation of a tach generator. (Level 3)
 - (e) Fabricate an electrical system cable. (Level 3)
 - (f) Repair a damaged engine electrical system wire. (Level 3)
 - (g) Replace and check a current limiter. (Level 3)
 - (h) Check/service/adjust one or more engine electrical system components. (Level 3)
 - (i) Troubleshoot an engine electrical system component. (Level 3)

D. AREA OF OPERATION: LUBRICATION SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Differences between straight mineral oil, ashless-dispersant oil, and synthetic oil.
 - (b) Types of oil used for different climates.
 - (c) Functions of an engine oil.
 - (d) Identification and selection of proper lubricants.
 - (e) Servicing of the lubrication system.
 - (f) The reasons for changing engine lubricating oil at specified intervals.
 - (g) The purpose and operation of an oil/air separator.
 - (h) Reasons for excessive oil consumption without evidence of oil leaks in a reciprocating and/or turbine aircraft engine.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Inspect an engine lubrication system to ensure continued operation. (Level 3)
 - (b) Inspect oil lines and filter/screen for leaks. (Level 3)
 - (c) Replace a defective oil cooler or oil cooler component. (Level 3)
 - (d) Replace a gasket or seal in the oil system, and accomplish a leak check. (Level 3)
 - (e) Adjust oil pressure. (Level 3)

- (f) Change engine oil, inspect screen(s) and/or filter, and leak check the engine. (Level 3)
- (g) Pre-oil an engine. (Level 2)

E. AREA OF OPERATION: IGNITION AND STARTING SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Troubleshooting a reciprocating and/or turbine engine ignition system.
 - (b) Replacement of an exciter box and safety concerns if the box is damaged.
 - (c) Troubleshooting a starter system.
 - (d) Checking a starter system for proper operation.
 - (e) The operation of a pneumatic starting system.
 - (f) Reasons for the starter dropout function of a starter generator or pneumatic starter.
 - (g) The purpose of a shear section in a starter output shaft.
 - (h) Purpose of checking a p-lead for proper ground.
 - (i) Inspection and servicing of an igniter and/or spark plug.
 - (j) Magneto systems, components, and operation.
 - (k) Function/operation of a magneto switch and p-lead circuit.
 - (l) High and low tension ignition systems.
- (2) CORE COMPETENCY ELEMENT: *Demonstrates the ability to perform at least one of the following (Level 3): TASKS:
 - (a) Check engine timing.
 - (b) Check a magneto switch for proper operation.
 - (c) Inspect a turbine engine ignition system for proper installation.
 - (d) Inspect a starter/generator for proper installation.
 - (e) Inspect magneto points.
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Install a magneto, and set timing on an aircraft engine. (Level 3)
 - (b) Repair an engine ignition and/or starter system. (Level 3)
 - (c) Remove, inspect, and install turbine engine igniter plugs, and perform a functional check of the igniter system. (Level 3)
 - (d) Inspect generator or starter-generator brushes. (Level 3)
 - (e) Install brushes in a starter or starter-generator. (Level 3)
 - (f) Install breaker points in a magneto and internally time the magneto. (Level 3)
 - (g) Repair an engine direct drive electric starter. (Level 3)
 - (h) Inspect and test an ignition harness with a high tension lead tester. (Level 3)
 - (i) Inspect and/or service and install aircraft spark plugs. (Level 3)
 - (j) Bench test an ignition system component. (Level 2)

F. AREA OF OPERATION: FUEL METERING SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Troubleshooting an engine that indicates high exhaust gas temperature (EGT) for a particular engine pressure ratio (EPR).
 - (b) Purpose of an acceleration check after a trim check.
 - (c) Reasons an engine would require a trim check.
 - (d) Purpose of the part power stop on some engines when accomplishing engine trim procedure.
 - (e) Procedure required to adjust (trim) a fuel control unit (FCU).
 - (f) Possible reasons for fuel running out of a carburettor throttle body.

- (g) Indications that would result if the mixture is improperly adjusted.
 - (h) Procedure for checking idle mixture on a reciprocating engine.
 - (i) Possible causes for poor engine acceleration, engine backfiring or missing when the throttle is advanced.
 - (j) Types and operation of various fuel metering systems.
 - (k) Fuel metering system components.
- (2) N/A
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following:
TASKS:
- (a) Remove and install the accelerating pump in a float-type carburettor. (Level 3)
 - (b) Check and adjust the float level of a float-type carburettor. (Level 3)
 - (c) Check the needle and seat in a float-type carburettor for proper operation. (Level 2)
 - (d) Check a fuel injection nozzle for proper spray pattern, and install a fuel injector nozzle.
 - (e) (Level 2)
 - (f) Check and adjust idle mixture. (Level 3)
 - (g) Install a turbine engine fuel nozzle. (Level 3)
 - (h) Locate and identify various fuel metering system components. (Level 2)
 - (i) Service a carburettor fuel screen. (Level 3)

G. AREA OF OPERATION: ENGINE FUEL SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
- (a) Inspection requirements for an engine fuel system.
 - (b) Checks of fuel systems to verify proper operation.
 - (c) Troubleshooting an engine fuel system.
 - (d) Procedure for inspection of an engine driven fuel pump for leaks and security.
 - (e) Function and/or operation of one or more types of fuel pumps.
 - (f) Function and/or operation of one or more types of fuel valves.
 - (g) Function and/or operation of engine fuel filters.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform at least one of the following (Level 3): TASKS:
- (a) Check a fuel selector valve for proper operation.
 - (b) Inspect an engine fuel filter assembly for leaks.
 - (c) Inspect a repair to an engine fuel system.
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following:
TASKS:
- (a) Check a fuel boost pump for proper operation. (Level 3)
 - (b) Repair fuel selector valve. (Level 3)
 - (c) Inspect a main fuel filter assembly for leaks. (Level 3)
 - (d) Check the operation of a remotely located fuel valve. (Level 3)
 - (e) Locate and identify a turbine engine fuel heater. (Level 2)
 - (f) Service an engine fuel strainer. (Level 3)
 - (g) Inspect an engine driven fuel pump for leaks and security, and perform an engine fuel pressure check. (Level 3)
 - (h) Repair an engine fuel system or system component. (Level 3)
 - (i) Troubleshoot a fuel pressure system. (Level 3)

H. AREA OF OPERATION: INDUCTION AND ENGINE AIRFLOW SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Inspection procedures for engine ice control systems and/or carburettor air intake and induction manifolds.
 - (b) Operation of an alternate air valve, both automatic and manual heat systems.
 - (c) Troubleshooting ice control systems.
 - (d) Explain how a carburettor heat system operates and the procedure to verify proper operation.
 - (e) Effect(s) on an aircraft engine if the carburettor heat control is improperly adjusted.
 - (f) Causes and effects of induction system ice.
 - (g) Function and operation of one or more types of supercharging systems and components.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform inspection of engine induction or airflow system to include at least one of the following (Level 3): TASKS:
 - (a) Engine ice control system
 - (b) Induction manifolds
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Repair a defective condition in a carburettor heat box. (Level 3)
 - (b) Check proper operation of an engine anti-ice system. (Level 3)
 - (c) Rig a carburettor heat box. (Level 3)
 - (d) Inspect an induction system. (Level 3)
 - (e) Replace an induction system manifold gasket and/or induction tube. (Level 3)
 - (f) Service an induction system air filter. (Level 3)
 - (g) Troubleshoot an engine malfunction resulting from a defective induction or supercharging system. (Level 3)

I. AREA OF OPERATION: ENGINE COOLING SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Required inspection on an engine cooling system.
 - (b) Operation of cowl flaps, and how cooling is accomplished.
 - (c) How turbine engine cooling is accomplished.
 - (d) Cooling of engine bearings and other parts on turbine engines.
 - (e) The importance of proper engine baffle and seal installation.
 - (f) The operation of a heat exchanger.
 - (g) The function and operation of an augments cooling system.
 - (h) Rotorcraft engine cooling systems.
- (2) N/A
- (3) ELEMENT: Demonstrate the ability to perform at least one of the following: TASKS:
 - (a) Inspect an engine cooling system. (Level 3)
 - (b) Check cowl flap operation and inspect rigging. (Level 3)
 - (c) Repair one or more cylinder cooling fins. (Level 3)
 - (d) Repair an engine pressure baffle plate. (Level 3)
 - (e) Inspect a heat exchanger. (Level 3)
 - (f) Troubleshoot an engine cooling system. (Level 3)
 - (g) Locate and identify rotorcraft cooling system components. (Level 2)

J. AREA OF OPERATION: ENGINE EXHAUST AND REVERSER SYSTEMS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Exhaust leak indications and/or methods of detection.
 - (b) Thrust reverser system operation and components.
 - (c) Differences between a cascade and a mechanical blockage door thrust reverser.
 - (d) Hazards of exhaust system failure.
 - (e) Effects of using improper materials to mark on exhaust system components.
 - (f) Function and operation of various exhaust system components.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform inspection of engine exhaust system and/or turbocharger system. (Level 3)
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Determine if components of an exhaust system are serviceable. (Level 2)
 - (b) Show the procedures to accomplish a pressurisation check of an exhaust system. (Level 2)
 - (c) Repair one or more exhaust system components. (Level 3)
 - (d) Check engine exhaust system for proper operation. (Level 3)
 - (e) Replace one or more exhaust gaskets. (Level 3)
 - (f) Install an engine exhaust system. (Level 3)
 - (g) Check a turbocharger and waste gate system for proper operation. (Level 3)
 - (h) Troubleshoot and/or repair a turbine engine thrust reverser system and/or system component(s). (Level 3)

K. AREA OF OPERATION: PROPELLERS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Propeller theory of operation.
 - (b) Checks necessary to verify proper operation of propeller systems.
 - (c) Procedures for proper application of propeller lubricants.
 - (d) Installation or removal of a propeller.
 - (e) Measurement of blade angle with a propeller protractor.
 - (f) Repairs classified as major repairs on an aluminium propeller.
 - (g) Reference data for reducing the diameter of a type certificated propeller.
 - (h) Operation of propeller system component(s).
 - (i) Propeller governor components and operation.
 - (j) Theory and operation of various types of constant speed propellers.
 - (k) Function and operation of propeller synchronising systems.
 - (l) Function and operation of propeller ice control systems.
- (2) CORE COMPETENCY ELEMENT: Demonstrates the ability to perform both of the following: TASKS:
 - (a) Inspection of a propeller installation, and make a minor repair on an aluminium propeller. (Level 3)
 - (b) Determine what minor propeller alterations are acceptable using the appropriate type certificate data sheet. (Level 2)
- (3) ELEMENT: Demonstrates the ability to perform at least one of the following: TASKS:
 - (a) Service a constant speed propeller with lubricant. (Level 2)
 - (b) Use a propeller protractor to determine correct blade angle. (Level 3)
 - (c) Leak check a constant speed propeller installation. (Level 3)
 - (d) Install a fixed pitch propeller and check the tip tracking. (Level 3)

- (e) Inspect a spinner/ bulkhead for defects and proper alignment and installation. (Level 3)
- (f) Dye-penetrant inspection to determine the amount of propeller damage. (Level 2)
- (g) Inspect and/or adjust a propeller governor. (Level 3)
- (h) Inspect a wood propeller. (Level 3)
- (i) Troubleshoot a propeller system. (Level 3)

L. AREA OF OPERATION: TURBINE POWERED AUXILIARY POWER UNITS

Objective: To determine that the applicant:

- (1) ELEMENT: Exhibits knowledge of at least two of the following: TASKS:
 - (a) Inspection to ensure proper operation of turbine driven auxiliary power unit.
 - (b) Replacement procedure for an igniter plug.
 - (c) Servicing an auxiliary power unit.
 - (d) Troubleshooting an auxiliary power unit.
 - (e) Function and operation of auxiliary power unit(s).

Note: Subject area T, AUXILIARY POWER UNITS, may be tested at the same time as AREA B, TURBINE ENGINES. No further testing of auxiliary power units is required.