Engineering Maintenance Technician – Dual Discipline (AP V1.0)

Level 3 Apprenticeship Standard (ST1443)

Specification



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This guide describes the different types of End-Point Assessment tests, the test rules and who should be involved. Preparing for End-Point Assessment and working with SIAS are also covered.

SIAS is the science industry assessment service. It is part of the Cogent Skills Group. For further information about apprenticeship standards and Trailblazers please contact info@siasuk.com.

Version History

Version	Updates
1.0	This document refers to Assessment Plan version 1.0
1.1	Amended grading criteria numbering for Observation with Questions

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Contents

Objective 4
Prior Learning and Qualifications 4
Overview 4
Competence Evaluation 5
Gateway Requirements 5
Assessment Methods 6
Assessment Method 1: Observation with Questions 6
Assessment Method 1: Observation with Questions Grading Descriptors 8
Assessment Method 1 Knowledge, Skills and Behaviours 13
Assessment Method 2: Interview Underpinned by a Portfolio of Evidence. 17
Assessment Method 2: Interview Underpinned by a Portfolio of Evidence Grading Descriptors 19
Assessment Method 2 Knowledge, Skills and Behaviours 22
Assessment Method 3: Multiple-choice Test 24
Assessment Method 3: Multiple-choice Test Grade Boundaries 25
Assessment Method 3: Multiple-choice Test Knowledge, Skills and Behaviours 25
Final Grade 28
Moderation 29
Re-takes and re-sits 29
Certification 29
Assessment Specification 29
Mapping of Knowledge, Skills, and Behaviours 30
Further Information 43

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Objective

The aim of this End-Point Assessment (EPA) is to ensure that the apprentice is occupationally competent against the knowledge, skills and behaviours outlined in the assessment plan for this standard.

Electrical and control and instrumentation maintenance technicians work covers electrical and control and instrumentation. For example, motors, single-phase and three-phase, power supplies, low voltage or high-voltage electrical distribution, programmable logic controllers, flow meters, heat exchangers and safety controls.

Electrical and mechanical maintenance technicians work covers electrical and mechanical. For example, motors, single-phase and three-phase, power supplies, and low voltage or high-voltage electrical distribution, actuators, fans, pumps, valves, gearboxes, and pipework.

Daily, they interact with other maintenance technicians, engineers, and support operatives. They also have contact with other internal and external stakeholders. This may include operations, managers, quality, research and development, and admin staff. They may also have contact with auditors, regulators, and customers undertaking site visits. They typically report to an experienced maintenance engineer.

They must maintain the safe and reliable operation of plant, equipment and systems. Work must comply with any industry specific regulations. Safety is a key priority. They must comply with health, safety, and environmental regulations and procedures, and sustainability practices. They must complete tasks in line with their company's procedures and timescales. They must also take account of wider business considerations.

This is a core and options apprenticeship. An apprentice must be trained and assessed against the core and one option. The options are:

- electrical and control and instrumentation technician
- electrical and mechanical maintenance technician

Prior Learning and Qualifications

Apprentices will need to have achieved English and mathematics qualifications in line with the apprenticeship funding rules at the time of their programme commencing.

Overview

The length of the training for this apprenticeship is typically 48 months. The apprentice must spend at least 12 months on-programme and complete the required amount of off-the-job training in line with the apprenticeship funding rules. The EPA period is typically 4 months.

The overall grades available for this apprenticeship are:

- fail
- pass
- merit
- distinction

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Competence Evaluation

During the apprenticeship, regular evaluation of the competence of the apprentice against the apprenticeship standard will help to ensure that they achieve full occupational competence by the end of their training, and they are ready for EPA. Confirmation from the employer that the apprentice is fully competent is needed before EPA can take place.

As competence evaluation is an in-programme activity, the process that is used for this has not been mandated. It is for the employer supported by their training provider to decide how they wish to do this. To help with this SIAS has produced the SIAS Competence Tracker.

Gateway Requirements

Apprentices must complete the gateway requirements and provide evidence to SIAS as detailed below before taking the EPA. On completion of the gateway requirements, the employer must confirm the apprentice as ready for the EPA.

To meet the gateway requirements for EPA the apprentice must have:

- achieved English and mathematics qualifications in line with the apprenticeship funding rules
- completed and submitted a portfolio of evidence for the Interview underpinned by a portfolio of evidence assessment method.

Portfolio of evidence requirements:

The apprentice must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should only contain evidence related to the KSBs that will be assessed during the interview. It will typically contain 10 discrete pieces of evidence. Evidence must be mapped against the KSBs. Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested.

Evidence sources may include:

- workplace documentation and records, for example: maintenance records, fault investigation reports
- witness statements
- annotated photographs
- video clips with a maximum total duration of 10 minutes; the apprentice must be in view and identifiable

This is not a definitive list; other evidence sources can be included.

The portfolio of evidence should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance, for example, witness statements, rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this. In the cases of national security, arrangements may be made between SIAS and the employer for the redaction of information in the evidence; as per the employer's security policy, or where this is not possible, on-site reviewing of the evidence prior to the interview taking place.

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SIAS will not assess the portfolio of evidence directly as it underpins the interview. The end-point assessor will review the portfolio of evidence to prepare questions for the interview. They are not required to provide feedback after this review.

Gateway evidence must be submitted to SIAS, along with any organisation specific policies and procedures requested by SIAS.

Assessment Methods

This End-Point Assessment has three assessment method:

1. Observation with Questions
2. Interview Underpinned by a Portfolio of Evidence
3. Multiple-choice Test.

Assessment Method 1: Observation with Questions

In the Observation with Questions, an end-point assessor observes the apprentice in their workplace and asks questions, giving the apprentices the opportunity to demonstrate the KSBs mapped to this assessment method. The apprentice completes their day-to-day duties under normal working conditions, and observations should take place in a realistic working environment that does not require special clearance.

Equipment and resources needed for the observation with questions must be provided by the employer or training provider. SIAS will liaise with the apprentice's employer or training provider to provide these. Any assessment materials relating to national security must not be submitted to SIAS. Apart from in the exceptional circumstances outlined below, simulation is not allowed.

Exceptional circumstances.

Where national security clearance, nuclear licenced clearance or live gas site safety concerns prevent access to the employer's site to administer the observation with questions, the end-point assessor must take advice from SIAS on access arrangements and how to record assessment evidence in line with the employer's requirements. In these circumstances the Observation with Questions can take place in a simulated environment selected by SIAS, for example, a training provider's premises, a training facility in the employer's premises, a test centre, or a similar simulated environment. This simulated environment must relate to the apprentice's natural work environment.

In all cases activities that enable the following skills to be assessed, S32, S39, S41, S42 and S58 only, may require minimal pre-installed aspects to replicate real scenarios and must be agreed by SIAS in advance of the assessment.

The observation with questions must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An end-point assessor must conduct and assess the observation with questions.

The end-point assessor must only observe one apprentice at a time to ensure quality and rigour. They must be as unobtrusive as possible.

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SIAS must give the apprentice 2 weeks' notice of the observation with questions.

The observation must take 5 hours.

The end-point assessor can increase the time of the observation with questions by up to 10%. This time is to allow the apprentice to complete a task or respond to a question if necessary.

The apprentice may choose to end the assessment method early. The apprentice must be confident they have demonstrated competence against the assessment requirements for the assessment method. The end-point assessor or SIAS must ensure the apprentice is fully aware of all assessment requirements. The end-point assessor or SIAS cannot suggest or choose to end the assessment methods early, unless in an emergency. SIAS is responsible for ensuring the apprentice understands the implications of ending an assessment early if they choose to do so. The end-point assessor may suggest the assessment continues. The end-point assessor must document the apprentice's request to end the assessment early

The observation may be split into discrete sections held on the same working day.

SIAS must manage invigilation of the apprentice during the assessment, to maintain security of the EPA, in line with their malpractice policy. This includes breaks and moving between locations.

The end-point assessor must explain to the apprentice the format and timescales of the observation with questions before it starts. This does not count towards the assessment time.

The end-point assessor should observe the following during the observation, to assess the apprentice's competence against all core requirements and their chosen option.

Core requirements

- organising own work
- maintaining workplace health, safety, security, and environmental compliance
- using work information and following working practices
- completing work records
- communicating with others.

Electrical and control and instrumentation engineering maintenance technician requirements

- conducting planned electrical and control and instrumentation maintenance.

Electrical and mechanical engineering maintenance technician requirements.

- conducting planned electrical and mechanical maintenance.

These activities provide the apprentice with the opportunity to demonstrate the KSBs mapped to this assessment method.

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The end-point assessor must ask questions. Questioning can occur both during and after the observation.

The purpose of the questions is:

- to seek clarification where required
- to assess the level of competence against the grading descriptors

The time for questioning is included in the overall assessment time. The end-point assessor must ask at least 6 questions. To remain as unobtrusive as possible, the end-point assessor should ask questions during natural stops between tasks and after completion of work rather than disrupting the apprentice's flow. The end-point assessor must use the questions from SIAS's question bank or create their own questions in line with SIAS's training. Follow-up questions are allowed where clarification is required.

The end-point assessor must ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the above set number of questions for the observation with questions and should be kept to a minimum.

The end-point assessor must make the grading decision. The end-point assessor must assess the observation and responses to questions holistically when deciding the grade.

The end-point assessor must keep accurate records of the assessment. They must record:

- the KSBs observed
- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved.

The observation with questions must take place in the apprentice's normal place of work for example, their employer's premises or a customer's premises. Equipment and resources needed for the observation must be confirmed to be available by SIAS, who can liaise with the employer to provide these. They must be in good and safe working condition. Questioning that occurs after the observation should take place in a suitable environment, for example a quiet room, free from distractions and influence.

Assessment Method 1: Observation with Questions Grading Descriptors

Theme KSBs	**Pass Grading Descriptor** Apprentices must demonstrate all of the pass descriptors for the core and their option	**Distinction Grading Descriptor** Apprentices must demonstrate all of the pass descriptors for the core and their option
Core - Organising own work K4 K5 S2 S3	**P1** Uses planning, prioritising, organising, and time management techniques and identifies and organises resources required to plan and complete tasks with consideration for quality, cost,	**D1** Justifies their planning decisions in terms of efficiencies they achieved and the balance of quality, cost, delivery, and ethical practice. (K4, K5, S2)

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option
	delivery, and ethical practices. (K4, K5, S2, S3)	
Core - Maintaining workplace health, safety, security, and environmental compliance K9 K10 K11 K12 K15 S7 S8 S9 S12 B1	**P2** Identifies potential hazards and risks in the work environment and applies control measures in line with safe systems of work. (K9, S7) **P3** Prioritises safe working practices by applying health, safety, and environmental procedures in compliance with regulations, standards, and guidelines including selection, use, and care of personal protective equipment. (K10, K11, S8, B1) **P4** Follows asset security procedures in line with task and company requirements. (K12, S9) **P5** Segregates items for reuse, recycling, and waste in line with the company's recycling and waste management requirements. (K15, S12)	**D2** Explains the importance of applying health, safety, and environmental procedures in their work. (K10, S8)
Core - Using work information and following working practices K19 K20 K22 K23 K24 S1 S5 S6 S14 S15 S16 S17 S23 B3	**P6** Reviews and uses information including engineering information to plan and complete tasks. (K19, S1) **P7** Identifies equipment to work on and checks plant configuration is as defined, identifying and highlighting issues with drawings in line with company procedures. (S5, S23) **P8** Prepares the work area for maintenance to meet task requirements in line with company procedures. (S6)	None

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option
	P9 Takes ownership for the delivery and quality of work by applying BSI and ISO engineering maintenance standards and procedures in line with standard operating procedures (SOPs). (K20, K22, K23, S14, B3) **P10** Applies foreign material exclusion procedures in line with task requirements and company procedures. (K24, S15) **P11** Follows maintenance tools and equipment control requirements in line with company procedures. (S16) **P12** Reinstates the work area in line with task requirements and company procedures. (S17)	
Core - Completing work records K25 S21	**P13** Records information for work tasks in line with their company procedures for documentation control and auditable records. (K25, S21)	None
Core - Communicating with others K29 S19	**P14** Uses verbal communication methods and techniques and industry terminology suitable for the context. (K29, S19)	None
Electrical and control and instrumentation engineering maintenance technician - Conducting planned electrical and control and instrumentation maintenance	**P15** Confirms the electrical isolation, lockout tagout, method has been applied and tests for dead in line with task requirements and company procedures. Conducts and confirms isolation of connected services in line with task requirements and company procedures.	**D3** Justifies their approach to planned electrical maintenance. (K41, S31, S32, S34, S35, S37) **D4** Justifies their approach to planned control and instrumentation maintenance. (K53, S38, S39, S40, S41, S42)

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option
K34 K41 K42 K46 K53 K54 S27 S28 S31 S32 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43	Re-connects instrumentation power supply, cables, pipework, and services in line with task requirements and company procedures. Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K34, K46, S27, S36, S43) **P16** Selects electrical and control and instrumentation maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation, care and calibration requirements. (K42, K54, S28) **P17** Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of plant, removing and replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K41, S31, S32, S34, S35) **P18** Conducts planned control and instrumentation maintenance in line with task requirements and company procedures including inspecting and testing control and instrumentation systems, checking calibration and making adjustments, checking loop function, setting up and adjusting control and instrumentation systems, cleaning parts, and removing and replacing	

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option
	instruments and sensors. (K53, S38, S39, S40, S41, S42) **P19** Conducts functional testing to confirm operation in line with task requirements and company procedures (S37)	
Electrical and mechanical engineering maintenance technician - Conducting planned electrical and mechanical maintenance K58 K65 K66 K70 K74 K75 S44 S45 S46 S49 S50 S52 S53 S54 S55 S56 S57 S58 S59	**P20** Confirms safe electrical isolation, lockout tagout, method has been applied and tests for dead in line with task requirements and company procedures. Conducts and confirms isolation of connected services in line with task requirements and company procedures. Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K58, K70, S44, S45) **P21** Selects electrical and mechanical maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation and care requirements. (K66, K75, S46) **P22** Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of plant, removing and replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K65, S49, S50, S52, S53)	**D5** Justifies their approach to planned electrical maintenance. (K65, S49, S50, S52, S53) **D6** Justifies their approach to planned mechanical maintenance. (K74, S55, S56, S57, S58, S59)

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option
	P23 Conducts planned mechanical maintenance in line with task requirements and company procedures including checking condition and operation of mechanical aspects of plant and equipment, removing and replacing mechanical parts, examining mechanical parts for defects, setting up and adjusting mechanical aspects of plant, cleaning parts, and lubricating mechanical assemblies. (K74, S55, S56, S57, S58, S59) **P24** Conducts functional testing to confirm operation in line with task requirements and company procedures. (S54)	

Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Assessment Method 1 Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K4	Core: Business operation considerations: quality, cost, delivery, and ethical practices.
K5	Core: Planning, prioritisation, organisation, and time management techniques.
K9	Core: Work environment hazards and risks. Risk assessments.
K10	Core: Safe systems of work.
K11	Core: Personal protective equipment (PPE): selection, use, and care.
K12	Core: Asset security requirements.
K15	Core: Recycling and waste management requirements.
K19	Core: Sources of engineering information.
K20	Core: Engineering standards - British (BSI) and International (ISO).
K22	Core: Quality management systems.
K23	Core: Standard operating procedures (SOPs): what they are and why they are important.
K24	Core: Foreign material exclusion requirements.
K25	Core: Documentation requirements: documentation control, auditable records.
K29	Core: Verbal communication methods and techniques. Engineering maintenance terminology.

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K34	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Electrical isolation and deisolation requirements: lockout tagout and testing for dead.
K41	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.
K42	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Electrical maintenance tools, measurement and test equipment application, operation, care and calibration requirements.
K46	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Isolation and deisolation of connected services considerations and requirements.
K53	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Control and instrumentation equipment and control systems maintenance requirements and methods: removing and replacing instruments and sensors, inspecting, testing, cleaning, setting up, calibration, and functional testing.
K54	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Control and instrumentation maintenance tools and equipment application, operation, care and calibration requirements.
K58	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electrical isolation and deisolation requirements: lockout tagout and testing for dead.
K65	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.
K66	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.
K70	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Isolation and deisolation of connected services considerations and requirements.
K74	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Mechanical maintenance requirements and techniques: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and lubricating.
K75	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Mechanical maintenance tools and equipment application, operation, care, and calibration requirements.
Skills	
S1	Core: Review and use information. For example, work instructions, drawings, design specifications, and plant configurations.

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S2	Core: Use planning, prioritising, organising, and time management techniques to plan tasks.
S3	Core: Identify and organise resources to complete tasks. For example, consumables.
S5	Core: Identify equipment to work on. Check plant configuration is as defined.
S6	Core: Prepare the work area for maintenance tasks.
S7	Core: Identify environmental and health and safety hazards and risks and apply control measures.
S8	Core: Apply health, safety, and environmental procedures in compliance with regulations, standards, and guidance. For example, signage and barriers, working at height, confined spaces, and COSHH.
S9	Core: Follow security procedures. For example, site access, document classification, and securing assets.
S12	Core: Segregate items for reuse, recycling, and waste.
S14	Core: Apply engineering maintenance standards and procedures.
S15	Core: Apply foreign material exclusion procedures.
S16	Core: Follow maintenance tools and equipment control procedures. For example, handling and storage.
S17	Core: Reinstate the work area.
S19	Core: Communicate with others to give and receive information. For example, colleagues, customers, and stakeholders.
S21	Core: Record information.
S23	Core: Identify and highlight issues (red pen) with technical drawings.
S27	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Confirm safe electrical isolation lockout tagout method has been applied and test for dead.
S28	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Select, check, and use electrical maintenance tools, measurement, and test equipment. Select, check, and use control and instrumentation maintenance tools, measurement, and test equipment.
S31	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.
S32	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Remove and replace electrical parts.
S34	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Set up and adjust electrical aspects of plant.
S35	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Clean parts. For example, removal of dust and debris.
S36	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Conduct and confirm electrical and connected services isolation and deisolation.

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S37	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Conduct functional testing
S38	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Inspect and test control and instrumentation systems.
S39	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Check calibration and make adjustments.
S40	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Check loop function.
S41	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Set up and adjust control and instrumentation systems.
S42	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Remove and replace instruments and sensors.
S43	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Re-connect instrumentation power supply, cables, pipework, and services.
S44	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Confirm safe electrical isolation lockout tagout method has been applied and test for dead.
S45	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Conduct and confirm electrical and connected services isolation and deisolation.
S46	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Select, check, and use electrical and mechanical maintenance tools, measurement, and test equipment.
S49	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.
S50	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Remove and replace electrical parts.
S52	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Set up, align, and adjust electrical aspects of plant.
S53	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Clean parts. For example, removal of dust and debris.
S54	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Conduct functional testing.
S55	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Check condition and operation of mechanical aspects of plant and equipment. For example, pumps.
S56	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Remove and replace mechanical parts.

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S57	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Examine mechanical parts for defects. For example, pump seals.
S58	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Set up, align, and adjust mechanical aspects of plant.
S59	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Lubricate mechanical assemblies.
Behaviours	
B1	Core: Prioritise safe working practices. For example, risk aware, minimise risks, and proactively work towards preventing accidents.
B3	Core: Take ownership for the delivery and quality of own work. For example, self-motivated, disciplined in the approach to work tasks, and work carried out in line with standards.

Assessment Method 2: Interview Underpinned by a Portfolio of Evidence.

In the interview, an end-point assessor asks the apprentice questions. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence.

The interview must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An end-point assessor must conduct and assess the interview.

The purpose of the end-point assessor's questions is to assess the apprentice's competence against the following theme for the core and their chosen option:

Core

- impact of sector on maintenance activities
- role and responsibilities
- working sustainability
- participating in continuous improvement
- teamworking
- producing written documents
- digital and information technology

Electrical and control and instrumentation engineering maintenance technician

- electrical and control and instrumentation maintenance problem solving and fault finding
- cable installation and termination.

Electrical and mechanical engineering maintenance technician

- electrical and mechanical maintenance problem solving and fault finding

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- cable installation and termination
- bench fitting techniques

SIAS must give an apprentice 2 weeks' notice of the interview.

The end-point assessor must have at least 2 weeks to review the supporting documentation.

The apprentice must have access to their portfolio of evidence during the interview.

The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence however, the portfolio of evidence is not directly assessed.

The interview must last for 90 minutes. The end-point assessor can increase the time of the interview by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

The end-point assessor must ask at least 10 questions. The end-point assessor must use the questions from SIAS's question bank or create their own questions in line with SIAS's training. Follow-up questions are allowed where clarification is required.

The apprentice may choose to end the assessment method early. The apprentice must be confident they have demonstrated competence against the assessment requirements for the assessment method. The end-point assessor or SIAS must ensure the apprentice is fully aware of all assessment requirements. The end-point assessor or SIAS cannot suggest or choose to end the assessment methods early, unless in an emergency. SIAS is responsible for ensuring the apprentice understands the implications of ending an assessment early if they choose to do so. The end-point assessor may suggest the assessment continues. The end-point assessor must document the apprentice's request to end the assessment early.

The end-point assessor must make the grading decision.

The end-point assessor must keep accurate records of the assessment. They must record:

- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

The interview must take place in a suitable venue selected by SIAS, for example, the employer's premises.

The interview can be conducted by video conferencing. SIAS must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The interview should take place in a quiet room, free from distractions and influence.

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Assessment Method 2: Interview Underpinned by a Portfolio of Evidence Grading Descriptors

Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass and distinction descriptors for the core and their option
Core - Impact of sector on maintenance activities K1	**P1** Explains the impact of the sector that they work in on their maintenance activities. (K1)	None
Core - Role and responsibilities K2 K3 K16 S4 S10 S20	**P2** Outlines their role as a maintenance technician including their limits of responsibility and how they escalate issues in line with company procedures. (K3, S20) **P3** Describes how they respond and adapt to meet demands in their work with different maintenance disciplines and functional areas. (K2, S4) **P4** Describes how they have or would respond in an emergency situation in line with their company's emergency incident procedures. (K16, S10)	None
Core - Working sustainably K14 S11 B2	**P5** Describes how they consider and apply principles of sustainability when using resources and carrying out tasks to support the UK's net zero commitment. (K14, S11, B2)	**D1** Justifies the application of sustainability practices in maintenance activities. (K14, S11, B2)
Core - Participating in continuous improvement K26 S25 S26 B5	**P6** Describes how they have applied continuous improvement (CI) techniques to identify viable suggestions in line with the company's CI processes. (K26, S25) **P7** Describes planned and unplanned learning and development activities they have carried out and recorded to meet personal development needs,	**D2** Justifies the potential impact of their improvement suggestions with consideration to benefits and potential risks. (K26, S25)

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass and distinction descriptors for the core and their option
	showing a commitment to future CPD. (S26, B5)	
Core – Teamworking K27 K28 S18 B4	**P8** Describes how they apply team working principles to meet work goals and support inclusivity in line with their company's policy on equity, diversity, and inclusion. (K27, K28, S18, B4)	None
Core – Producing written documents K30 S22	**P9** Describes how they apply written communication techniques to produce or update documents in their work that are suitable for the context. (K30, S22)	None
Core - Digital and information technology K31 S24	**P10** Describes how they use digital and information technology in their work in compliance with their organisation's cyber security requirements and the General Data Protection Regulation (GPDR). (K31, S24)	None
Electrical and control and instrumentation engineering maintenance technician - Electrical and control and instrumentation maintenance problem solving and fault finding K43 K44 K45 K55 K56 S29 S30	**P11** Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures. Describes how they use control and instrumentation diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common control and instrumentation system failure	**D3** Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. Justifies diagnostic methods they have used in the identification and rectification of control and instrumentation system failure modes. (K43, K55, S30)

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass and distinction descriptors for the core and their option
	modes in line with task requirements and company procedures. (K43, K44, K45, K55, K56, S29, S30)	
Electrical and control and instrumentation engineering maintenance technician - cable installation and termination K40 S33	**P12** Describes how they prepare and terminate cables using methods in line with the task requirements and company procedures. (K40, S33)	None
Electrical and mechanical engineering maintenance technician – Electrical and mechanical maintenance problem solving and fault finding K67 K68 K69 K76 K77 S47 S48	**P13** Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures. Describes how they use mechanical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common problems relating to mechanical aspects of plant and equipment in line with task requirements and company procedures. (K67, K68, K69, K76, K77, S47, S48)	**D4** Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. Justifies diagnostic methods they have used in the identification and rectification of issues relating to mechanical aspects of plant and equipment. (K67, K76, S48)
Electrical and mechanical engineering	**P14** Describes how they prepare and terminate cables using methods in	

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Theme KSBs	Pass Grading Descriptor Apprentices must demonstrate all of the pass descriptors for the core and their option	Distinction Grading Descriptor Apprentices must demonstrate all of the pass and distinction descriptors for the core and their option
maintenance technician - cable installation and termination K64 S51	line with the task requirements and company procedures. (K64, S51)	
Electrical and mechanical engineering maintenance technician - Bench fitting techniques K78 S60	**P15** Describes how they apply bench fitting techniques including cutting threads, mechanical fitting, and joining in line with task requirements and company procedures. (K78, S60)	None

Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Assessment Method 2 Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K1	Core: Sectors in which engineering maintenance takes place. Impact of sector on maintenance activities.
K2	Core: Maintenance disciplines and functional areas and how they work together.
K3	Core: Individual maintenance technician's roles and responsibilities. Escalation procedures.
K14	Core: The UK's net zero commitment. Principles of sustainability.
K16	Core: Emergency incident and response procedures.
K26	Core: Continuous improvement (CI) systems and techniques.
K27	Core: Team working principles.
K28	Core: Principles of equity, diversity, and inclusion in the workplace.
K30	Core: Written communication techniques.
K31	Core: Digital and information technology to support engineering maintenance. General data protection regulation (GDPR). Cyber security.
K40	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Cable termination methods.
K43	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Common electrical plant, equipment, and systems failure modes.
K44	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Electrical fault-finding and rectification techniques; diagnostic equipment.

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Ref	Grading descriptor
K45	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Problem solving and critical reasoning techniques.
K55	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Common control and instrumentation equipment and control system failure modes.
K56	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Control and instrumentation maintenance fault-finding and rectification techniques; diagnostic equipment.
K64	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Cable termination methods.
K67	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Common electrical plant, equipment, and systems failure modes.
K68	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electrical fault-finding and rectification techniques; diagnostic equipment.
K69	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Problem solving and critical reasoning techniques.
K76	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Common maintenance problems relating to mechanical aspects of plant and equipment.
K77	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Mechanical maintenance fault-finding and rectification techniques; diagnostic equipment.
K78	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Bench fitting techniques: cutting threads, mechanical fitting, and joining.
Skills	
S4	Core: Respond and adapt to work demands. For example, adapt working methods to reflect changes in working environment, re-prioritise workloads to react to breakdowns and fault scenarios.
S10	Core: Follow emergency incident and response procedures.
S11	Core: Apply sustainability principles. For example, minimising waste.
S18	Core: Apply team working principles.
S20	Core: Escalate issues outside limits of responsibility.
S22	Core: Produce or update documents. For example, handover notes and reports.
S24	Core: Use digital and information technology. For example, databases, data sharing platforms, email, management information systems, and word processing. Follow cyber security and GDPR requirements.
S25	Core: Apply continuous improvement techniques to identify improvement suggestions.
S26	Core: Carry out and record planned and unplanned learning and development activities.
S29	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Use electrical diagnostic equipment

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Ref	Grading descriptor
	and apply fault finding and rectification techniques. Use control and instrumentation diagnostic equipment and apply fault finding and rectification techniques.
S30	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Apply problem solving and critical reasoning techniques.
S33	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Prepare and terminate electrical cables.
S47	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Use electrical and mechanical diagnostic equipment and apply fault finding and rectification techniques.
S48	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Apply problem solving and critical reasoning techniques.
S51	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Prepare and terminate electrical cables.
S60	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Apply bench fitting techniques.
Behaviours	
B2	Core: Consider sustainability when using resources and carrying out tasks.
B4	Core: Team-focus to meet work goals and support inclusivity. For example, support others, show respect to others, and create and maintain productive working relationships
B5	Core: Committed to continued professional development to maintain and enhance competence.

Assessment Method 3: Multiple-choice Test

In the multiple-choice test, the apprentice answers questions in a controlled and invigilated environment. It gives the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method.

The multiple-choice test must be structured to give the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method to the highest available grade.

The test can be computer or paper based.

The test will consist of 50 multiple-choice questions.

Multiple-choice questions must have four options, including one correct answer.

A minimum of two questions must be included for the assessment of S13 and must be scenario based to assess the application of mathematical principles and formulae used to support engineering maintenance.

The apprentice must be given at least 2 weeks' notice of the date and time of the test.

The apprentice must have 75 minutes to complete the test.

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The test is closed book which means that the apprentice cannot refer to reference books or materials whilst taking the test.

The following equipment is allowed to be used during the test:

- a scientific calculator.

The test must be taken in the presence of an invigilator who is the responsibility of SIAS. SIAS must have an invigilation policy setting out how the test must be conducted. It must state the ratio of apprentices to invigilators for the setting and allow the test to take place in a secure way.

SIAS must verify the apprentice's identity and ensure invigilation of the apprentice for example, with 360-degree cameras and screen sharing facilities.

SIAS is responsible for the security of the test including the arrangements for on-line testing. SIAS must ensure that their security arrangements maintain the validity and reliability of the test.

The test must be marked by an independent assessor or marker employed by SIAS. They must follow a marking scheme produced by SIAS. Marking by computer is allowed where question types support this.

A correct answer gets 1 mark.

Any incorrect or missing answers get zero marks.

SIAS is responsible for overseeing the marking of the test.

The apprentice must take the test in a suitably controlled and invigilated environment that is a quiet room, free from distractions and influence. SIAS must check the venue is suitable.

The test can take place remotely if the appropriate technology and systems are in place to prevent malpractice.

Assessment Method 3: Multiple-choice Test Grade Boundaries

Grade	Minimum marks required	Maximum marks required
Fail	0	34
Pass	35	50

Assessment Method 3: Multiple-choice Test Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K6	Core: Equipment life cycle considerations.
K7	Core: Maintenance strategies: planned preventative maintenance (PPM), condition-based maintenance (CBM), scheduled maintenance, total productive maintenance (TPM), breakdown and run to failure maintenance.
K8	Core: Health and safety regulations – key features and impact on role: ATEX - safety requirements for workplaces and equipment used in explosive atmospheres, Control of Asbestos Regulations, Control of Major Accident

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Ref	Grading descriptor
	Hazards (COMAH) Regulations, Control of Substances Hazardous to Health (COSHH) Regulations, Dangerous Substances and Explosive Atmospheres Regulations (DSEAR), Display Screen Equipment Regulations (DSE), Health and Safety at Work Act (HASAWA), Lifting Operations and Lifting Equipment Regulations (LOLER), Management of Health and Safety at Work, Manual Handling Operations Regulations, Personal Protective Equipment (PPE) at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Working at Height Regulations, Working in Confined Spaces Regulations, Workplace (health, safety, and welfare) Regulations.
K13	Core: Environmental regulations and standards – impact on role: Environmental Management Systems standard, Environmental Protection Act, and Hazardous Waste Regulations.
K17	Core: Algebraic methods. Trigonometric methods and standard formulae to determine areas and volumes. Statistical methods to display data (mean, mode, median). Elementary calculus techniques: coefficient, gradient of a curve, rate of change.
K18	Core: Properties of engineering materials and impact on use.
K21	Core: Engineering representations, sketches, drawings, and graphical information conventions.
K32	Core: Industry 4.0 - the integration of physical systems with internet connectivity and cloud computing: technologies, systems, and benefits.
K33	Electrical and control and instrumentation engineering maintenance technician: Electrical engineering maintenance technician. Electricity at Work regulations. IET wiring regulations.
K35	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Principles of single phase and three-phase equipment, plant, and systems, the operation of motors and generators, and the use of monitoring and protection equipment.
K36	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Electrical engineering principles: circuit terminology, Ohm's Law, transformer theory and power calculations.
K37	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Functions and applications of electrical circuits.
K38	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.
K39	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Different types of cables; their specifications and application.
K47	Electrical and control and instrumentation engineering maintenance technician:

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Ref	Grading descriptor
	Electrical and control and instrumentation. Control and instrumentation engineering principles, terminology, and calculations.
K48	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Control and instrumentation equipment installation and connection requirements.
K49	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Operating principles of control and instrumentation devices: flow, level, pressure, and temperature instruments, analysers, transducers, transmitters, gauges, and pneumatics.
K50	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Open and closed loop systems. First and second order control systems. Proportional–integral–derivative controller (PID controller or three-term controller).
K51	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Functions and applications of control and instrumentation systems: programmable logic controller (PLC), Direct Digital Control (DDC), Distributed Control System (DCS), and Supervisory Control And Data Acquisition (SCADA).
K52	Electrical and control and instrumentation engineering maintenance technician: Electrical and control and instrumentation. Types of control and instrumentation diagrams.
K57	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electricity at Work regulations. IET wiring regulations.
K59	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Principles of single phase and three-phase equipment, plant, and systems, the operation of motors and generators, and the use of monitoring and protection equipment.
K60	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Electrical engineering principles: circuit terminology, Ohm's Law, transformer theory, and power calculations.
K61	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Functions and applications of electrical circuits.
K62	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.
K63	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Different types of cables; their specifications and application.
K71	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Mechanical principles, terminology, and calculations: stress, strains, bending moment, heat transfer, fluid dynamics.
K72	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Function and application of mechanical elements of plant and equipment.
K73	Electrical and mechanical engineering maintenance technician:

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Ref	Grading descriptor
	Electrical and mechanical. Pneumatic and hydraulic system principles: Air compressors, hydraulic pumps, filters, regulators, lubricators.
K79	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Different types of mechanical fasteners and their uses.
K80	Electrical and mechanical engineering maintenance technician: Electrical and mechanical. Types of diagrams used to represent mechanical installations and assemblies; symbols and abbreviations used to represent parts in diagrams.
Skills	
S13	Core: Use mathematical principles and formulae to support engineering maintenance.

Final Grade

Performance in the EPA determines the overall grade of:

- fail
- pass
- merit
- distinction

An end-point assessor must individually grade the observation with questions and interview underpinned by a portfolio of evidence in line with this EPA plan.

SIAS must combine the individual assessment method grades to determine the overall EPA grade.

If the apprentice fails one assessment method or more, they will be awarded an overall fail.

To achieve an overall pass, the apprentice must achieve at least a pass in all the assessment methods. To achieve an overall merit, the apprentice must achieve a distinction in the observation with questions and a pass in the other two assessment methods. To achieve an overall distinction, the apprentice must achieve a distinction in the observation with questions and interview underpinned by a portfolio of evidence, and a pass in the multiple-choice test.

Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA overall.

Observation with Questions	Interview Underpinned by a Portfolio of Evidence	Multiple-Choice Test	Overall Grading
Any grade	Any grade	Fail	Fail
Any grade	Fail	Any grade	Fail

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Fail	Any grade	Any grade	Fail
Pass	Pass	Pass	Pass
Pass	Distinction	Pass	Pass
Distinction	Pass	Pass	Merit
Distinction	Distinction	Pass	Distinction

Moderation

Assessment organisations will undertake moderation of end-point assessor decisions through observations and examination of documentation on a risk sampling basis. Results cannot be confirmed until moderation has been completed.

Re-takes and re-sits

If the apprentice fails one assessment method or more, they can take a re-sit or a re-take at their employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does. The apprentice should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and SIAS should agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

Failed assessment methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to an apprentice wishing to move from pass to a higher grade.

The apprentice will get a maximum EPA grade of if pass they need to re-sit or re-take one or more assessment methods, unless SIAS determines there are exceptional circumstances.

Certification

The outcomes from the End-Point Assessment will be reviewed and a grade conferred by SIAS in accordance with SIAS QA procedures, which are available from SIAS. SIAS will notify the employer of the outcome of each of the assessments.

SIAS will apply for the apprentice's certificate, which will be sent by ESFA. The certificate confirms that the apprentice has passed the End-Point Assessment, has demonstrated full competency across the standard and is job-ready.

Assessment Specification

The assessment specification can be found in the published assessment plan for the standard. Details of which elements of the apprenticeship standard will be tested by each test are given in the Mapping Knowledge, Skills, and Behaviours section of this guide.

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Mapping of Knowledge, Skills, and Behaviours

Key:	
Observation with Questions	Obs
Interview Underpinned by a Portfolio of Evidence	Int
Multiple-choice Test	MCQ

Ref	KSB to be assessed	Assessment Method
Knowledge		
K1	Core: Sectors in which engineering maintenance takes place. Impact of sector on maintenance activities.	Int
K2	Core. Maintenance disciplines and functional areas and how they work together.	Int
K3	Core. Individual maintenance technician's roles and responsibilities. Escalation procedures.	Int
K4	Core. Business operation considerations: quality, cost, delivery, and ethical practices.	Obs
K5	Core. Planning, prioritisation, organisation, and time management techniques.	Obs
K6	Core. Equipment life cycle considerations.	MCQ
K7	Core. Maintenance strategies: planned preventative maintenance (PPM), condition-based maintenance (CBM), scheduled maintenance, total productive maintenance (TPM), breakdown and run to failure maintenance.	MCQ
K8	Core. Health and safety regulations – key features and impact on role: ATEX - safety requirements for workplaces and equipment used in explosive atmospheres, Control of Asbestos Regulations, Control of Major Accident Hazards (COMAH) Regulations, Control of Substances Hazardous to Health (COSHH) Regulations, Dangerous Substances and Explosive Atmospheres Regulations (DSEAR), Display Screen Equipment Regulations (DSE), Health and Safety at Work Act (HASAWA), Lifting Operations and Lifting Equipment Regulations (LOLER), Management of Health and Safety at Work, Manual Handling Operations Regulations, Personal Protective Equipment (PPE) at Work	MCQ

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Ref	KSB to be assessed	Assessment Method
	Regulations, Provision and Use of Work Equipment Regulations (PUWER), The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Working at Height Regulations, Working in Confined Spaces Regulations, Workplace (health, safety, and welfare) Regulations.	
K9	Core. Work environment hazards and risks. Risk assessments.	Obs
K10	Core. Safe systems of work.	Obs
K11	Core. Personal protective equipment (PPE): selection, use, and care.	Obs
K12	Core. Asset security requirements.	Obs
K13	Core. Environmental regulations and standards – impact on role: Environmental Management Systems standard, Environmental Protection Act, and Hazardous Waste Regulations.	MCQ
K14	Core. The UK's net zero commitment. Principles of sustainability.	Int
K15	Core. Recycling and waste management requirements.	Obs
K16	Core. Emergency incident and response procedures.	Int
K17	Core. Algebraic methods. Trigonometric methods and standard formulae to determine areas and volumes. Statistical methods to display data (mean, mode, median). Elementary calculus techniques: coefficient, gradient of a curve, rate of change.	MCQ
K18	Core. Properties of engineering materials and impact on use.	MCQ
K19	Core. Sources of engineering information.	Obs
K20	Core. Engineering standards - British (BSI) and International (ISO).	Obs
K21	Core. Engineering representations, sketches, drawings, and graphical information conventions.	MCQ
K22	Core.	Obs

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Ref	KSB to be assessed	Assessment Method
	Quality management systems.	
K23	Core. Standard operating procedures (SOPs): what they are and why they are important.	Obs
K24	Core. Foreign material exclusion requirements.	Obs
K25	Core. Documentation requirements: documentation control, auditable records.	Obs
K26	Core. Continuous improvement (CI) systems and techniques.	Int
K27	Core. Team working principles.	Int
K28	Core. Principles of equity, diversity, and inclusion in the workplace.	Int
K29	Core. Verbal communication methods and techniques. Engineering maintenance terminology.	Obs
K30	Core. Written communication techniques.	Int
K31	Core. Digital and information technology to support engineering maintenance. General data protection regulation (GDPR). Cyber security.	Int
K32	Core. Industry 4.0 - the integration of physical systems with internet connectivity and cloud computing: technologies, systems, and benefits.	MCQ
K33	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electricity at Work regulations. IET wiring regulations.	MCQ
K34	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electrical isolation and deisolation requirements: lockout tagout and testing for dead.	Obs
K35	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Principles of single phase and three-phase equipment, plant, and systems, the operation of	MCQ

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Ref	KSB to be assessed	Assessment Method
	motors and generators, and the use of monitoring and protection equipment.	
K36	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electrical engineering principles: circuit terminology, Ohm's Law, transformer theory and power calculations.	MCQ
K37	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Functions and applications of electrical circuits.	MCQ
K38	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.	MCQ
K39	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Different types of cables; their specifications and application.	MCQ
K40	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Cable termination methods.	Int
K41	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.	Obs
K42	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electrical maintenance tools, measurement and test equipment application, operation, care and calibration requirements.	Obs
K43	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Common electrical plant, equipment, and systems failure modes.	Int
K44	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Electrical fault-finding and rectification techniques; diagnostic equipment.	Int

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Ref	KSB to be assessed	Assessment Method
K45	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Problem solving and critical reasoning techniques.	Int
K46	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Isolation and deisolation of connected services considerations and requirements.	Obs
K47	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Control and instrumentation engineering principles, terminology, and calculations.	MCQ
K48	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Control and instrumentation equipment installation and connection requirements.	MCQ
K49	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Operating principles of control and instrumentation devices: flow, level, pressure, and temperature instruments, analysers, transducers, transmitters, gauges, and pneumatics.	MCQ
K50	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Open and closed loop systems. First and second order control systems. Proportional–integral–derivative controller (PID controller or three-term controller).	MCQ
K51	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Functions and applications of control and instrumentation systems: programmable logic controller (PLC), Direct Digital Control (DDC), Distributed Control System (DCS), and Supervisory Control And Data Acquisition (SCADA).	MCQ
K52	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Types of control and instrumentation diagrams.	MCQ
K53	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Control and instrumentation equipment and control systems maintenance requirements and methods: removing and replacing instruments and sensors, inspecting, testing, cleaning, setting up, calibration, and functional testing.	Obs

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Ref	KSB to be assessed	Assessment Method
K54	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Control and instrumentation maintenance tools and equipment application, operation, care and calibration requirements.	Obs
K55	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Common control and instrumentation equipment and control system failure modes.	Int
K56	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Control and instrumentation maintenance fault-finding and rectification techniques; diagnostic equipment.	Int
K57	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electricity at Work regulations. IET wiring regulations.	MCQ
K58	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electrical isolation and deisolation requirements: lockout tagout and testing for dead.	Obs
K59	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Principles of single phase and three-phase equipment, plant, and systems, the operation of motors and generators, and the use of monitoring and protection equipment.	MCQ
K60	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electrical engineering principles: circuit terminology, Ohm's Law, transformer theory, and power calculations.	MCQ
K61	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Functions and applications of electrical circuits.	MCQ
K62	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.	MCQ
K63	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Different types of cables; their specifications and application.	MCQ
K64	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Cable termination methods.	Int
K65	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.	Obs

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Ref	KSB to be assessed	Assessment Method
K66	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.	Obs
K67	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Common electrical plant, equipment, and systems failure modes.	Int
K68	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Electrical fault-finding and rectification techniques; diagnostic equipment.	Int
K69	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Problem solving and critical reasoning techniques.	Int
K70	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Isolation and deisolation of connected services considerations and requirements.	Obs
K71	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Mechanical principles, terminology, and calculations: stress, strains, bending moment, heat transfer, fluid dynamics.	MCQ
K72	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Function and application of mechanical elements of plant and equipment.	MCQ
K73	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Pneumatic and hydraulic system principles: Air compressors, hydraulic pumps, filters, regulators, lubricators.	MCQ
K74	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Mechanical maintenance requirements and techniques: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and lubricating.	Obs
K75	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Mechanical maintenance tools and equipment application, operation, care, and calibration requirements.	Obs
K76	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Common maintenance problems relating to mechanical aspects of plant and equipment.	Int
K77	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Mechanical maintenance fault-finding and rectification techniques; diagnostic equipment.	Int
K78	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Bench fitting techniques: cutting threads, mechanical fitting, and joining.	Int
K79	Electrical and mechanical engineering maintenance technician.	MCQ

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Ref	KSB to be assessed	Assessment Method
	Electrical and mechanical. Different types of mechanical fasteners and their uses.	
K80	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Types of diagrams used to represent mechanical installations and assemblies; symbols and abbreviations used to represent parts in diagrams.	MCQ
Skills		
S1	Core. Review and use information. For example, work instructions, drawings, design specifications, and plant configurations.	Obs
S2	Core. Use planning, prioritising, organising, and time management techniques to plan tasks.	Obs
S3	Core. Identify and organise resources to complete tasks. For example, consumables.	Obs
S4	Core. Respond and adapt to work demands. For example, adapt working methods to reflect changes in working environment, re-prioritise workloads to react to breakdowns and fault scenarios.	Int
S5	Core. Identify equipment to work on. Check plant configuration is as defined.	Obs
S6	Core. Prepare the work area for maintenance tasks.	Obs
S7	Core. Identify environmental and health and safety hazards and risks and apply control measures.	Obs
S8	Core. Apply health, safety, and environmental procedures in compliance with regulations, standards, and guidance. For example, signage and barriers, working at height, confined spaces, and COSHH.	Obs
S9	Core. Follow security procedures. For example, site access, document classification, and securing assets.	Obs
S10	Core. Follow emergency incident and response procedures.	Int
S11	Core. Apply sustainability principles. For example, minimising waste.	Int
S12	Core.	Obs

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Ref	KSB to be assessed	Assessment Method
	Segregate items for reuse, recycling, and waste.	
S13	Core. Use mathematical principles and formulae to support engineering maintenance.	MCQ
S14	Core. Apply engineering maintenance standards and procedures.	Obs
S15	Core. Apply foreign material exclusion procedures.	Obs
S16	Core. Follow maintenance tools and equipment control procedures. For example, handling and storage.	Obs
S17	Core. Reinstate the work area.	Obs
S18	Core. Apply team working principles.	Int
S19	Core. Communicate with others to give and receive information. For example, colleagues, customers, and stakeholders.	Obs
S20	Core. Escalate issues outside limits of responsibility.	Int
S21	Core. Record information.	Obs
S22	Core. Produce or update documents. For example, handover notes and reports.	Int
S23	Core. Identify and highlight issues (red pen) with technical drawings.	Obs
S24	Core. Use digital and information technology. For example, databases, data sharing platforms, email, management information systems, and word processing. Follow cyber security and GDPR requirements.	Int
S25	Core. Apply continuous improvement techniques to identify improvement suggestions.	Int
S26	Core. Carry out and record planned and unplanned learning and development activities.	Int

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Ref	KSB to be assessed	Assessment Method
S27	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Confirm safe electrical isolation lockout tagout method has been applied and test for dead.	Obs
S28	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Select, check, and use electrical maintenance tools, measurement, and test equipment. Select, check, and use control and instrumentation maintenance tools, measurement, and test equipment.	Obs
S29	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Use electrical diagnostic equipment and apply fault finding and rectification techniques.	Int
S30	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Apply problem solving and critical reasoning techniques.	Int
S31	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.	Obs
S32	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Remove and replace electrical parts.	Obs
S33	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Prepare and terminate electrical cables.	Int
S34	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Set up and adjust electrical aspects of plant.	Obs
S35	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Clean parts. For example, removal of dust and debris.	Obs
S36	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Conduct and confirm electrical and connected services isolation and deisolation.	Obs
S37	Electrical and control and instrumentation engineering maintenance technician.	Obs

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Ref	KSB to be assessed	Assessment Method
	Electrical and control and instrumentation. Conduct functional testing.	
S38	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Inspect and test control and instrumentation systems.	Obs
S39	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Check calibration and make adjustments.	Obs
S40	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Check loop function.	Obs
S41	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Set up and adjust control and instrumentation systems.	Obs
S42	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Remove and replace instruments and sensors.	Obs
S43	Electrical and control and instrumentation engineering maintenance technician. Electrical and control and instrumentation. Re-connect instrumentation power supply, cables, pipework, and services.	Obs
S44	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Confirm safe electrical isolation lockout tagout method has been applied and test for dead.	Obs
S45	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Conduct and confirm electrical and connected services isolation and deisolation.	Obs
S46	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Select, check, and use electrical and mechanical maintenance tools, measurement, and test equipment.	Obs
S47	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Use electrical and mechanical diagnostic equipment and apply fault finding and rectification techniques.	Int
S48	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Apply problem solving and critical reasoning techniques.	Int
S49	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.	Obs
S50	Electrical and mechanical engineering maintenance technician.	Obs

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Ref	KSB to be assessed	Assessment Method
	Electrical and mechanical. Remove and replace electrical parts.	
S51	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Prepare and terminate electrical cables.	Int
S52	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Set up, align, and adjust electrical aspects of plant.	Obs
S53	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Clean parts. For example, removal of dust and debris.	Obs
S54	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Conduct functional testing.	Obs
S55	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Check condition and operation of mechanical aspects of plant and equipment. For example, pumps.	Obs
S56	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Remove and replace mechanical parts.	Obs
S57	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Examine mechanical parts for defects. For example, pump seals.	Obs
S58	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Set up, align, and adjust mechanical aspects of plant.	Obs
S59	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Lubricate mechanical assemblies.	Obs
S60	Electrical and mechanical engineering maintenance technician. Electrical and mechanical. Apply bench fitting techniques.	Int
Behaviours		
B1	Core. Prioritise safe working practices. For example, risk aware, minimise risks, and proactively work towards preventing accidents.	Obs
B2	Core. Consider sustainability when using resources and carrying out tasks.	Int
B3	Core. Take ownership for the delivery and quality of own work. For example, self-motivated, disciplined in the approach to work tasks, and work carried out in line with standards.	Obs
B4	Core. Team-focus to meet work goals and support inclusivity. For example, support others, show respect to others, and create and maintain productive working relationships.	Int
B5	Core.	Int

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Ref	KSB to be assessed	Assessment Method
	Committed to continued professional development to maintain and enhance competence.	

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Further Information

For information about SIAS policies, quality assurance, re-sits, appeals, complaints and general enquiries please see our website: www.siasuk.com

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