



STANDARD DRAFT PREVIEW

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Standard in development
L3: Land-based service engineering technician

Title of occupation

Land-based service engineering technician

UOS reference number

ST0243

Core and options

No

Level of occupation

Level 3

Occupational maps data

Route: Agriculture, environmental and animal care

Pathway: Agriculture, Land Management and Production

Cluster: Agricultural Engineering Operative/Technician

Typical duration of apprenticeship

24 months

Target date for approval

01/09/2024

Resubmission

No

Would your proposed apprenticeship standard replace an existing framework?

No

Does professional recognition exist for the occupation?

Yes

Occupation summary

This occupation is typically found in the agricultural, horticultural, forestry, amenities and outdoor power sectors.

A land-based engineering technician may work in the employer's workplace or on site from a fully equipped service vehicle. They are required to work flexible working hours as dictated by seasonal requirements.

The technician acts as an ambassador for the employer's business and the products represented, utilising their own initiative in a customer facing role.

Businesses employing land-based engineering technicians deliver technical support to their end user customers, dealership networks or own manufacturing activities.

The broad purpose of the occupation is to support the customer by conducting installation, setup, maintenance, diagnostic and the repair of land-based equipment throughout its end to end operating lifecycle.

They will conduct inspections and consultations and compile condition reports. They diagnose and repair complex faults in prime movers, machinery, and equipment, prepare repair proposals and implement timely and cost-effective repairs.

The land-based engineering technician will verify the performance of prime movers, machinery and equipment against the manufacturer's specification and customers' expectations.

They understand the interrelationship of machines and the interface between machine, biological systems and the influence of the crop condition and working environment on optimum performance and operating expense.

They perform a multi-disciplinary role requiring a diverse blend of diagnostic activities and logical thought processes relating to mechanical, hydraulic, pneumatic, electrical, electronic and autonomous and automated land-based machinery and equipment.

In their daily work, an employee in this occupation interacts with a wide range of internal and external customers. This may include colleagues, suppliers, manufacturers, business to business customers and the public. They will embrace equality, diversity and inclusion.

They will typically report to a line manager.

An employee in this occupation will be responsible for completing work to specification and quality requirements, on schedule and without immediate supervision.

Land-based service engineering technicians are responsible for managing the outcome of their assigned tasks.

They need to consider the land-based environment and conditions in which they operate along with health and safety and the implications of lone working.

Technicians are often called upon to supervise and mentor junior colleagues and dispense advice to customers regarding machinery selection and the application of technologically advanced products.

Typical job titles

Agricultural machinery service technician

Agricultural service technician

Field service technician

Forestry service engineering technician

Golf and turf service technician

Grounds care service technician

Horticultural service engineering technician

Land-based service engineering technician

Milking parlour technician

Are there any statutory/regulatory or other typical entry requirements?

Yes

Entry requirements

Employers set the selection criteria for their apprentices. Typically, this may include the completion of a level 2 land based engineering apprenticeship or equivalent experience. Employers may also typically require applicants to have achieved 4 GCSE's at Grade 4-9 or equivalent to include English, mathematics and a science subject.

Occupation duties

DUTY	KSBS
<p>Duty 1 Conduct technical consultations specific to land-based machinery, equipment and prime movers and the environment in which they are utilised. Including precision technologies, technological developments, machinery interaction with crop, turf, soil conditions, livestock, weather or climatic conditions and optimum operational efficiency.</p>	<p>K1 K4 K9 K18 K20 K21 K22 K23 K24</p> <p>S1 S2 S4 S5 S6 S11 S13 S16 S17 S19 S31</p> <p>B1 B2 B5 B6 B7 B8 B9</p>
<p>Duty 2 Gather intelligence on the malfunction, breakdown and performance of land-based machinery, equipment and prime movers. Including their application, operation and interaction with each other, the working environment and factors influencing performance (such as crop and soil types, soil conditions and weather).</p>	<p>K1 K6 K7 K8 K9 K10 K11 K16 K18 K22 K23 K24</p> <p>S1 S2 S3 S4 S5 S6 S8 S9 S11 S12 S13 S15 S16 S17 S18 S27 S31</p> <p>B1 B3 B6 B7 B9</p>
<p>Duty 3 Undertake on-site operational testing of land-based machinery, equipment and prime movers to either simulate the conditions leading to customer complaints or to validate operational performance.</p>	<p>K1 K6 K7 K8 K9 K10 K22 K23 K24</p> <p>S1 S2 S3 S4 S6 S8 S11 S13 S14 S15 S16 S17 S18 S27 S31</p> <p>B1 B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 4 Perform appropriate diagnostic processes to test and record technical data, intermittent faults and developing faults. Including the use of crop, environment, fluid sampling and analysis, monitoring via telemetry.</p>	<p>K1 K6 K7 K8 K9 K10 K11 K16 K18 K23 K24</p> <p>S1 S2 S3 S4 S6 S8 S9 S11 S12 S13 S14 S15 S16 S17 S18 S27 S31</p> <p>B1 B3 B4 B5 B6 B7 B9</p>
<p>Duty 5 Examine failed parts and gathered information to establish the root cause of land-based machinery, equipment and prime mover failures.</p>	<p>K1 K7 K10 K11 K12</p> <p>S1 S2 S3 S4 S6 S8 S9 S12 S13 S15 S16 S17</p> <p>B1 B3 B4 B5 B6 B7 B9</p>

<p>Duty 6 Formulate and communicate conclusions and recommend viable repair options, considering timelines, due diligence, and the impact on the customer's land-based operation. For example crop, produce, surface quality, and revenue loss.</p>	<p>K6 K8 K10 K11 K12 K15 K16 K18 K21 K22</p> <p>S2 S3 S4 S5 S6 S8 S9 S11 S12 S13 S15 S16 S17 S18 S22 S23 S24 S27 S31</p> <p>B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 7 Compile detailed technical reports and communicate findings and actions taken or required to resolve issues, keeping stakeholders informed of progress and managing escalation.</p>	<p>K6 K7 K8 K10 K11 K12 K15 K16 K18 K19 K21</p> <p>S1 S3 S4 S5 S6 S9 S11 S12 S13 S14 S15 S16 S17 S18 S22 S23 S24 S26 S27 S31</p> <p>B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 8 Carry out mechanical repairs to complex land-based machinery, equipment and prime movers. Including preparation, processing, cutting, conditioning, placement, application, material handling, transportation, autonomous and operator controlled prime movers, machinery and equipment.</p>	<p>K1 K10 K11 K12 K13 K14 K16 K21</p> <p>S1 S2 S4 S6 S7 S8 S9 S10</p> <p>B1 B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 9 Conduct complex electrical and electronic system repairs on land-based machinery, equipment and prime movers. For example, precision technology, electronic systems management, telemetry, autonomous and automated operations used in the land-based sector.</p>	<p>K1 K15 K17</p> <p>S1 S2 S3 S4 S6 S7 S9 S10 S14 S32</p> <p>B1 B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 10 Conduct complex repairs to hydraulic, pneumatic, hydrostatic, fluid powered systems employed in land-based machinery, equipment and prime movers.</p>	<p>K1 K16 K19 K21</p> <p>S1 S2 S3 S4 S6 S7 S9 S10</p> <p>B1 B2 B3 B4 B5 B6 B7 B9</p>
<p>Duty 11 Supervise, support and implement a schedule of repair operations for others to follow.</p>	<p>K5 K13 K14 K16</p> <p>S2 S4 S6 S7 S9 S12 S14 S15 S20 S21 S23</p> <p>B2 B4 B5 B6 B9</p>
<p>Duty 12 Install, demonstrate and hand over land-based engineering machinery and equipment in bespoke land-based environments in accordance with legislative requirements and company</p>	<p>K4 K9 K20 K22 K23 K24</p> <p>S1 S2 S3 S4 S6 S11 S16 S17 S18 S19 S25 S26 S31</p>

procedures. Including the handover of repaired machines adjusted to accommodate varying crop types, soil types and conditions, crop and climatic conditions.	B1 B2 B3 B4 B5 B6 B7 B9
Duty 13 Set up land-based machinery, equipment and prime movers to achieve optimal performance. Optimise precision technologies and consider sustainable production, seasonal changes, minimising waste and meet net zero objectives.	K1 K4 K9 K16 K20 K22 K23 K24 S1 S2 S4 S6 S11 S16 S17 S18 S19 S25 S26 S31 B1 B2 B3 B4 B5 B6 B7 B9
Duty 14 Engage in Continuing Professional Development (CPD) and share best practice, keeping up to date with advances in land-based working practices and the land-based engineering technologies associated with them.	K5 K20 K25 S4 S30 B9 B10
Duty 15 Support the completion of technical expert reports and statements for use in dispute cases involving land-based engineering machinery and equipment. (for example misrepresentation, not fit for purpose, not of merchantable quality, negligent repair, accidents and insurance claims).	K6 K7 K8 K9 K10 K12 K13 K14 K15 K16 K18 K19 K20 K22 K23 K24 S1 S2 S3 S4 S6 S8 S11 S12 S13 S15 S16 S17 S18 S22 S31 B2 B6 B7 B8 B9
Duty 16 Provide recommendations and technical information to support the preparation of estimates and quotations for the repair, refurbishment, resale and seasonal servicing of land-based machinery, equipment and prime movers.	K4 K6 K7 K9 K10 K12 K13 K14 K15 K16 K18 K19 K20 K21 K22 K23 K24 S1 S2 S3 S4 S5 S6 S8 S9 S11 S12 S13 S14 S15 S16 S17 S18 S21 S23 S24 S27 S31 B2 B4 B5 B6 B7 B8 B9
Duty 17 Carry out dynamic risk assessments for activities carried out in land-based engineering environments, considering the diverse aspects of the work site (for example, biosecurity, livestock, diseases, cross contamination, remote lone working, toxic working environments, contamination and decontamination).	K1 K2 K3 K23 S2 S3 S4 S6 S28 S29 B1 B5 B6 B7 B9

KSBs

Knowledge

- K1:** The importance of ensuring compliance with health and safety legislation and ensuring the safety of self, colleagues and others in the work environment.
- K2:** How to administer emergency first aid and implications when working remotely in isolated rural locations.
- K3:** Risks encountered when working onsite in the land-based sector, the procedures to monitor and review risk assessments, identify new hazards, risks and methods of mitigation.
- K4:** How to identify and evaluate environmentally friendly and sustainable land based working practices.
- K5:** Techniques and methods used to support and develop colleagues.
- K6:** How to interpret diagnostic data (including telematics) and apply this information to form dynamic, logical fault finding and diagnostic processes.
- K7:** Principles and processes applied to diagnostics to reach logical, evidence based conclusions.
- K8:** Methods used to simulate the conditions and land based work environments and test the validity of customer complaints.
- K9:** How operational techniques, machine application, crops and soil types, the weather and working environment affect field-based performance.
- K10:** Root cause analysis and fault finding techniques.
- K11:** How to assess land-based machinery and equipment for repair considering crop and revenue loss when determining options.
- K12:** How to compile technical reports, statements and recommendations.
- K13:** Methods used to repair complex mechanical land-based prime movers.
- K14:** Methods used to repair land-based machinery and equipment attachments.
- K15:** Methods used to repair complex electrical and electronic systems including network communication systems, GPS, telematics, autonomous and automation.
- K16:** The application of precision land based technology, electronic management systems.
- K17:** How to maintain the integrity of electrical components.
- K18:** The differences between ownership, stewardship and custodianship of big data and how it is utilised in the land-based sector.
- K19:** How to conduct complex repairs to hydraulic, pneumatic, hydrostatic and fluid powered systems.
- K20:** How to set-up, operate and validate the performance of land-based prime-movers machinery and equipment and the factors that impact optimum performance including, crop

condition, crop types, weather conditions, soil and surface types, maintenance, and operating techniques.

K21: Factors to consider when conducting land-based technical consultations including, floatation tyres, ballast, cutting or working width, power requirements, range of adjustments, service ability, speeds of operation, combinations of machinery and residual values.

K22: How to determine compatibility of machinery combinations with prime movers and their interaction with one another.

K23: Handover and installation procedures to colleagues, customers and end users.

K24: Customer interaction, customer care techniques and how to deal with demanding customers, customer complaints and unrealistic expectations.

K25: Methods used to keep up to date with land based technological and working practice advances.

Skills

S1: Interpret technical data, documentation, schematic diagrams, wiring diagrams and technical specifications.

S2: Work in accordance with Safe Systems of Work and apply control measures such as Health and Safety at Work Act, lone working, working at height and risk assessments adopting mitigation measures to safeguard, bystanders, the public, property and livestock.

S3: Use digital equipment to interrogate land-based machinery, equipment and prime mover performance and extract data and communicate to stakeholders.

S4: Obtain information from colleagues and stakeholders employing a range of techniques.

S5: Establish the information required to perform an efficient and effective diagnosis.

S6: Communicate technical matters to technical and non-technical stakeholders.

S7: Perform repairs of technologically advanced land-based machinery, equipment and prime movers in accordance with manufacturer's guidelines and industry standards.

S8: Measure and assess wear tolerances and deformation in line with manufacturer instructions or guidance.

S9: Identify components that require either repair or replacement, including providing alternative solutions for repair or replacement as appropriate.

S10: Repair or replace component parts in accordance with manufacturer guidelines.

S11: Establish and replicate the circumstances and conditions that give rise to reported faults.

S12: Determine whether reported symptoms are a characteristic or a fault.

- S13:** Diagnose faults and reported underperformance of land-based machinery, equipment and prime movers using approved diagnostic procedures and equipment and logical problem-solving techniques.
- S14:** Maintain, interrogate, calibrate and repair electronic equipment and systems, including precision technology, electronic management systems, telemetry, autonomous and automated operations used in the land-based sector.
- S15:** Differentiate between the root cause and symptom of land-based machinery, equipment and prime mover failures.
- S16:** Identify crop, soil, climatic and environmental factors that impact on the performance of land-based machinery, equipment and prime movers.
- S17:** Identify the equipment settings appropriate to the working conditions giving due consideration to crop, soil types, conditions and environments, weather and climatic conditions.
- S18:** Perform verification tests to check performance against manufacturer specification land-based machinery, equipment and prime mover performance.
- S19:** Identify stakeholder requirements and provide tailored advice that informs their selection and operation of appropriate machinery, equipment and prime movers to meet the land based environment in which it will be operated.
- S20:** Applies supervision and mentoring techniques to support junior colleagues' development.
- S21:** Plan and prepare maintenance or repair work schedules for showing task allocation, sequencing, workflow and time management.
- S22:** Compile technical reports and statements.
- S23:** Provide technical input to facilitate the compilation of repair schedules, action plans, quotations and estimates.
- S24:** Identify the parts and services required to enable the reinstatement of land-based machinery, equipment and prime movers for the purposes of estimates and quotations.
- S25:** Perform installation and handover of machinery, equipment and prime movers, explaining their safe operation, the settings required for the environmental conditions and application, the maintenance and warranty requirements.
- S26:** Establish level of customer understanding of how to operate the machinery or equipment following installation and handover.
- S27:** Use predictive and preventative maintenance effectively to minimise land-based machinery, equipment and prime mover downtime.
- S28:** Identify toxic and hazardous substances and environments and apply suitable and sustainable control measures.

S29: Dispose of equipment, components and substances in accordance with environmental regulations, industry standards and company policy.

S30: Keep up to date with advances in environment land-based working practices and the land-based engineering technologies and share best practice.

S31: How contextual factors (including operational techniques, application, crop, soil types and conditions, environments, weather and climatic conditions) impact on machine performance and faults.

S32: Repair complex electrical and electronic systems in accordance with job requirements.

Behaviours

B1: Actively complies with and promotes a safe and healthy working environment.

B2: Is an ambassador for the business, respecting confidentiality, working efficiently, treating customers, employees and colleagues respectfully whilst meeting customer and employer expectations.

B3: Uses own initiative to make recommendations and complete work. Completes tasks on schedule and accordance with the job requirements.

B4: Demonstrates attention to detail and employs a logical approach to problem resolution.

B5: Embraces a sustainable working culture, taking responsibility for the careful use of resources and appropriate handling and disposal of waste products connected with land-based engineering machinery and equipment.

B6: Acts ethically and with integrity, giving considered guidance to stakeholders and following up on unresolved matters and outstanding questions.

B7: Adapts to changes in work environments, instructions and tasks.

B8: Committed to keeping up to date with industry best practice, relevant legislation and technological advancement.

B9: Stays motivated and committed when facing adverse challenges.

B10: Promotes equality, diversity and inclusion.

Qualifications

English and Maths

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Does the apprenticeship need to include any mandated qualifications in addition to the above-mentioned English and maths qualifications?

No

Professional recognition

This standard aligns with the following professional recognition:

- The Institution of Agricultural Engineers (IAgrE) for Engineering Technician (EngTech)

Consultation

Consultation was carried out for approximately 2 weeks up to 12 April 2024. The draft standard was sent out to the trailblazer group for them to share with contacts.

The document was shared with LE-TEC and circulated to AEA, BAGMA and IAGRE members.

All feedback has been considered and incorporated as appropriate. The overarching feedback was very positive. Whilst respondents were small in number, they focussed on very detailed aspects of content. This gives reassurance that stakeholders providing comments had given the documents their full consideration.

An employer provider highlighted the need to consider the scope of robotic content in the KSBs and the duties. On reflection, the trailblazer group felt that the term robotics should be replaced by reference to autonomous and automated vehicles as this more accurately reflected the requirements and avoid misinterpretation.

It was felt that other feedback provided granular detail that would assist with consistent delivery of the KSBs and end point assessment. The trailblazer group will publish a scoping document providing more detail relating to the KSBs. This document will include granular detail on the expectations regarding mentoring and supervision of others.

In addition, the trailblazer group plan to hold standardisation and consistency meetings with end point assessment organisations. This demonstrates a considerable commitment to ensuring consistency and the raising of standards across the sector.

Progression Routes

Supporting uploads

Mandatory qualification uploads

Mandated degree evidence uploads

Professional body confirmation uploads

ST0243_standard_professional-body-confirming-alignment_Land-based Service
Engineering Technician Apprenticeship Standard__ ST0243 - EngTech v1 Approval.docx

Subject sector area

3.1 Agriculture