

T Level Technical Qualification in Agriculture Land Management and Production: Land-based Engineering Occupational Specialism (Level 3)

Practical Assignment Candidate Pack (Sample)

September 2023 Version 2.1

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Version and date	Change Detail	Section
V1.0	Draft version	n/a
v2.0 June 2023	Approved version	n/a
V2.1 Sept 2023	Task 1a rephrased	Tasks

1. Assessment

This assessment is for the Land-based engineering Occupational Specialism of the Technical Qualification. This pack consists of a practical assignment brief that you will need to use to complete your assessment tasks.

Performance outcomes

The weightings for each performance outcome will remain the same for every version of the practical assignment. This ensures the appropriate depth and breadth of knowledge and skills for each specialism can be reliably assessed in every version and meets the needs of industry while keeping comparability between each assessment over time.

Performance Outcome	Typical knowledge and skills	Weighting
PO2 Maintain land-based machinery and equipment	Develop knowledge and skills relating to the safe practice applied prior to, during and following maintenance and storage activities, which include the retrieval and interpretation of technical data, maintenance schedule (scheduled and preventative), out of season storage requirements, and the verification of machinery operation after maintenance work.	22.5%
PO3 Repair land-based machinery and equipment	Develop the knowledge and skills required to safely prepare machinery for repairs, the safe practice required to dismantle, reassemble and verify conformity of components, sub-assemblies and machinery and equipment during and after repair activities.	37.5%
PO4 Diagnose land-based machinery and equipment faults	Develop knowledge and skills to safely carry out diagnostic activities on hydraulic, electronic and technologically advanced systems on land-based engineering machinery and equipment.	30%
PO5 Handover land-based machinery and equipment	Apply knowledge of land-based machinery and equipment to prepare and safely handover machinery and equipment from any manufacturer, when provided with relevant and appropriate information and data.	10%

2. Candidate guidance

General guidance

This is a formal assessment that you will be marked and graded on. You will be marked on the quality and accuracy of the work you produce. It is therefore important that you carry your work out to the highest standard you can.

Plagiarism

Plagiarism is the failure to acknowledge sources properly and/or the submission of another person's work as if it were your own. Plagiarism is not allowed in this assignment.

This assignment is an assessment of your abilities, so the work submitted must be all your own and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the assignment. Your assessor is allowed to give you general advice ie clarification of the task instructions. However, general advice will not include:

- Any specific advice on how to improve work to meet the required standard.
- Feedback on anything missing from your work.
- Any intervention that improves the standard or presentation of work.

If there is a need to provide more than general advice your assessor will need to record the advice, they have given and take it into account when marking the submitted work.

Where research is allowed, your assessor must be able to identify which work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge sources used and clearly reference any information taken from them (eg providing as a minimum a list of web addresses/books/articles etc. used).

Timings and planning

You are advised to study the details of the assessment before starting.

You should check with your assessor that you have all the relevant materials, equipment and information/data sources that you need before starting the assessment.

You should take care when planning to make sure you have divided the time available between parts of the assignment tasks appropriately. Timings for tasks are provided within this pack to support with planning and time allocation.

If you have a good reason for needing more time, you will need to explain the reasons to your assessor and agree a new time for the assessment to take place. Any changes will be at the discretion of the assessor and agreed by City & Guilds.

Word counts

Typical word counts, where indicated, are to be used as approximates for guidance to support the production of sufficient evidence. The marking will relate to the quality of the evidence produced and not whether the word count has been met.

Health and Safety

You must always work safely, while you are carrying out practical tasks.

You must always follow any relevant Health and Safety regulations, Risk Assessments and codes of practice in line with centre requirements.

If your assessor sees you working in a way that is unsafe for yourself or others, they will highlight the issue and ask you to stop the task immediately.

Presentation of work

Presentation of work must be neat, legible and appropriate to the task and evidence required for submission.

You should make sure that each piece of evidence, including any forms, are clearly labelled with your name and the task reference.

All electronic files must be given a clear file name that allows your assessor to identify it as your work.

Written work may be digital or handwritten unless stated otherwise.

All sketches and drawings should be neat, tidy and annotated.

Calculations should be set out clearly, with all working shown, as well as any assumptions made. You should use appropriate units at all times, consistent with the requirements of the assignment.

Instructions for this assignment

Ensure you read all the provided assessment information issued by the assessor.

You must work independently and not share your work with any other candidates in these supervised assessment sessions.

Your work will be kept secure during any supervised breaks that are taken.

Internet access is **not** allowed, unless otherwise stated in the task.

You will not be permitted any additional notes, such as printed resources and textbooks, unless otherwise stated in the conditions for assessment.

You must complete all the tasks and present all evidence that is detailed in each task.

This assessment booklet contains the assignment brief.

The tasks have been separated into individual documents which will be handed to you at the start of each task.

Any additional documents/templates needed for the task will be provided to you by the assessor.

Within each task you will find the following:

- **Resources:** Provides a list of equipment, documents or tools that you will have access to, to complete the task/sub task.

- **Conditions of assessment:** This will tell you the duration and rules you must follow when completing a task.
- **Controlled conditions:** This will tell you the rules you must follow when completing each task eg you must not share or discuss your work with other candidates.
- **What must be produced for marking:** This describes the evidence you must submit when the task is completed. Be aware that failure to submit any evidence requested can adversely affect your overall mark for the assessment.
- **Additional evidence for this task:** This describes other forms of evidence that will be collected by the assessor to support the marking of your performance. This will often include but is not limited to photo and video evidence.

Performance outcome assessment themes

A set number of marks are allocated against each performance outcome assessment theme, based on the performance outcome weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

You will be assessed against these assessment themes. This assignment brief has a total of 120 marks. The table below shows the mark distribution for this assessment.

Performance outcome (PO)	PO assessment themes	Sub-themes	Marks per assessment theme	Total marks per performance outcome
PO2 Maintain land-based machinery and equipment	Maintenance preparation	n/a	9	27
	Information and factors influencing maintenance	n/a	6	
	Carry out maintenance	n/a	12	
PO3 Repair land-based machinery and equipment	Information and factors influencing repairs	n/a	9	45
	Repair processes	Dismantle machinery and equipment	12	
		Component repair methods	12	
		Reassemble machinery and equipment	12	
PO4 Diagnose land-based machinery and equipment faults	Preparation for diagnosis	n/a	12	36
	Carry out diagnosis	n/a	12	
	Interpret information	n/a	12	
PO5 Handover land-based machinery and equipment	Handover	n/a	12	12
Totals			120	120

3. Assignment brief

You are a technician at The BLE Engineering Company, which is a land-based machinery dealership providing sales, maintenance and repair services for the land-based sector. The company provides a wide range of machinery and equipment, including for agriculture, ground care, construction, horticulture, forestry and domestic gardening.

You work with the following staff:

- workshop manager, who co-ordinates the technicians
- workshop administrator
- technicians
- apprentices
- stores staff.

You have been assigned to work on four tasks for your customer, Guild Hire Ltd, who lease machinery and equipment to local businesses. The machinery and equipment need regular servicing and maintenance due to the operating conditions.

You are required to undertake tasks that are typical of the type of work which the company does for Guild Hire Ltd: scheduled maintenance, repairs, diagnosing faults and handover of machinery and equipment to Guild Hire Ltd.

Guild Hire Ltd was set up when a farmer decided to diversify their business and operates out of a maintenance workshop on their farm. Guild Hire Ltd usually brings the machinery to the workshop, so most of the tasks will take place in the workshop; some tasks will take place at a location representing the Guild Hire Ltd maintenance workshop at the farm.

Within the tasks you will need to ensure machinery is working within manufacturers' specifications, select the appropriate tools and techniques for your work and ensure appropriate risk assessments, job cards and records are completed. It is expected that you comply with your centre's health and safety policy throughout the tasks.

This assignment has four tasks and a total time of 24 hours.

Please read **all** information carefully before the assessment.

4. Tasks

Task 1 – Maintain land-based machinery and equipment

1a) Maintain taper roller bearings in a 4WD front axle

The maintenance is due on the hub swivel taper roller bearings assemblies of a 4WD front axle. The customer has reported a knocking sound when movement starts and stops.

You must:

- safely inspect and adjust the hub swivel taper roller bearings assemblies on one side of the axle to be compliant with the manufacturer's settings:
 - complete a risk assessment using the *Risk assessment template (Figure 1)* provided by the assessor
 - select suitable tools and equipment, and prepare the work area
 - report on the condition of the Universal joints and oil seals
 - complete a job card using the *Job card template (Figure 2)* provided by the assessor
 - classify and dispose of waste appropriately
 - answer questions from the assessor during the task.

Resources

- Appropriate workshop, tools, equipment, and parts.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- Computer for completing templates digitally (no internet access).

Conditions of assessment

- The time allocated for this task is **4 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job Card

Additional evidence for this task

- Assessor observation
- Photo and video evidence by the assessor
- Responses to questions, including audio recording

1b) Prepare machinery and equipment for out of season storage

A pedestrian-controlled mower and a crop sprayer have been hired out for the summer, and have now been returned to Guild Hire Ltd.

You must:

- safely prepare and complete out of season storage tasks for the pedestrian-controlled mower and crop sprayer consistent with the manufacturers' specifications:
 - complete a risk assessment using the *Risk assessment template (Figure 1)* provided by the assessor
 - select suitable tools and equipment, and prepare the work area
 - carry out the tasks consistent with manufacturers' specifications
 - complete a job card using the *Job card template (Figure 2)* provided by the assessor
 - classify and dispose of waste appropriately.

Resources

- Appropriate workshop, tools, equipment, and parts.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- Computer for completing templates digitally (**no** internet access).

Conditions of assessment

- The time allocated for this task is **3 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job card

Additional evidence for this task

- Assessor observation
- Photo evidence by the assessor

Task 2 – Diagnose land-based machinery and equipment faults

2a) Diagnose machinery with ineffective hydraulics

Guild Hire Ltd reports that the hydraulically-driven unloading elevator on a potato harvester is operating slowly. Their customer needs this to be resolved quickly so that they do not lose the harvest opportunity window.

Guild Hire Ltd has brought the tractor in to the workshop with suspected faulty auxiliary hydraulics.

You must:

- safely undertake an appropriate test on the tractor's auxiliary hydraulic system to explore if the fault lies within the tractor's hydraulic system:
 - complete a risk assessment for the testing procedure using the *Risk assessment template (Figure 1)* provided by the assessor
 - select suitable tools and equipment, and prepare the tractor and work area
 - undertake the diagnostic test
 - compare the test results with the manufacturer's data
 - record all data and information on the *Job card template (Figure 2)* provided by the assessor, which must include:
 - outcome of the test
 - explanation of the possible cause(s) of the fault.
 - answer questions from the assessor during the task.

Resources

- Appropriate workshop, tools, and equipment.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- computer for completing templates digitally (**no** internet access).

Conditions of assessment

- The time allocated for this task is **2 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job Card

Additional evidence for this task

- Assessor observation
- Photo and video evidence by the assessor
- Responses to questions, including audio recording

2b) Diagnose machinery in limp mode

Guild Hire Ltd has a vehicle which has gone into limp mode whilst out on hire, causing the engine to lose power. It has been returned to the hire shop location, but they do not want to move it unnecessarily.

You must:

i) prepare to carry out diagnostic activities at the Guild Hire Ltd site:

- your assessor will tell you what the piece of machinery is, and provide the relevant service manual
- select and prepare suitable tools, equipment and consumables for the task; these will be taken to the hire shop to assess the vehicle on site.

ii) carry out the diagnostic once you have travelled to the Guild Hire Ltd site:

- complete a risk assessment for working at the hire shop, using the *Risk assessment template (Figure 1)* provided by the assessor
- prepare the work area and vehicle for this task
- carry out diagnostics using appropriate tools and software
- analyse the results to make a diagnosis
- recommend rectification
- complete a job card with actual time taken and consumables used, using the *Job card template (Figure 2)* provided by the assessor
- answer questions from the assessor during the task.

Resources

- Appropriate workshop, tools, and equipment.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- Computer for completing templates digitally (**no** internet access).

Conditions of assessment

- The time allocated for this task is **3 hours**:
 - i) 1 hour
 - ii) 2 hours.
- You must carry out the task on your own, under **controlled conditions**.
- Part ii) will take place at the Guild Hire Ltd site – the assessor will assign a different work area to part i).
- Internet access is permitted for part i) of this task.
- Internet access is **not** permitted for part ii) of this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.

- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job Card

Additional evidence for this task

- Assessor observation
- Photo evidence by the assessor
- Responses to questions, including audio recording

Task 3 – Repair land-based machinery and equipment

3a) Remove and refit a double-acting hydraulic cylinder

Guild Hire Ltd reports that there is oil leaking from the rod end of a hydraulic cylinder on a machine. A test has already been carried out to establish which cylinder is leaking.

For safety reasons, this is a simulated task where the double-acting hydraulic cylinder must be removed from the machine and then the same double-acting hydraulic cylinder refitted.

Physical assistance can be requested for handling the cylinder and realigning the attachment points.

You must:

- safely remove and refit a double-acting hydraulic cylinder:
 - complete a risk assessment using the *Risk assessment template (Figure 1)* provided by the assessor
 - select suitable tools and equipment, and prepare the work area and machine
 - remove the hydraulic cylinder indicated by the assessor after checking the system pressure has been released, collecting the oil in an appropriate container
 - refit the same hydraulic cylinder
 - receive confirmation from the assessor before progressing to the next step
 - verify the functionality of the hydraulic cylinder on the machine
 - complete a job card using the *Job card template (Figure 2)* provided by the assessor
 - classify and dispose of waste appropriately.

Resources

- Appropriate workshop, tools, and equipment.
- Parts for refitting the hydraulic cylinder.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- Computer for completing templates digitally (**no** internet access).

Conditions of assessment

- The time allocated for this task is **2 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job Card

Additional evidence for this task

- Assessor observation
- Photo evidence by the assessor

3b) Repair a double-acting hydraulic cylinder

You have been given a double-acting hydraulic cylinder to repair.

You must:

- safely repair and reseal a double-acting hydraulic cylinder:
 - complete a risk assessment using the *Risk assessment template (Figure 1)* provided by the assessor
 - select suitable tools and equipment, and prepare the work area
 - strip and inspect the hydraulic cylinder
 - repair and reseal the hydraulic cylinder as required
 - reassemble the hydraulic cylinder
 - complete a job card using the *Job card template (Figure 2)* provided by the assessor, including a report on the condition of the hydraulic cylinder with possible causes for any faults found
 - classify and dispose of waste appropriately
 - answer questions from the assessor during the task.

Resources

- Appropriate workshop, tools, and equipment.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Job card template (Figure 2)*.
- PPE
- Computer for completing templates digitally (**no** internet access).

Conditions of assessment

- The time allocated for this task is **3 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Job Card

Additional evidence for this task

- Assessor observation
- Photo evidence by the assessor
- Responses to questions, including audio recording

Task 4 – Land-based machinery and equipment: customer handover

4a) Prepare for a customer handover

A highway-compliant all-terrain/utility vehicle needs to be handed over to the operator at Guild Hire Ltd.

You must:

- prepare for the handover to the operator at the Guild Hire Ltd site, which must:
 - include preparation notes for you to explain the operation of the vehicle; you **will not** be asked to demonstrate the operation
 - include what information will be covered for the vehicle
 - be presented in a digital format of your choice.

The handover should take no longer than 45 minutes; travel time does not need to be included.

Resources

- Computer for producing the notes digitally (**no** internet access).
- Operator handbook, service manual, maintenance requirements, and warranty conditions of the vehicle.

Conditions of assessment

- The time allocated for this task is **3 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- You will have access to the relevant service manual, operation and maintenance requirements, and warranty conditions of the vehicle.
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Preparation notes for the handover of the vehicle (typically two sides of A4, or equivalent)

Additional evidence for this task

- n/a

4b) Pre delivery inspection

The highway-compliant all-terrain/utility vehicle needs a pre delivery inspection (PDI).

You must:

- complete a risk assessment for the inspection using the *Risk assessment template (Figure 1)* provided by the assessor
- safely undertake and record the PDI so that the vehicle complies with the manufacturer's specifications, including:
 - selection of tools and equipment, preparation of the work area and vehicle.
- record the PDI on the *Pre deliver inspection checklist template (Figure 3)* provided by the assessor.

Resources

- Appropriate suitable workshop, tools, and equipment.
- Operator handbook.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Pre delivery inspection checklist template (Figure 3)*.
- PPE
- Computer for completing templates digitally (**no** internet access).
- A copy of your notes from sub task 4a (for reference only).

Conditions of assessment

- The time allocated for this task is **3 hours**.
- You must carry out the task on your own, under **controlled conditions**.
- You will be given a copy of your notes from sub task 4a (for reference only).
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Pre delivery inspection checklist

Additional evidence for this task

- Assessor observation
- Photo evidence by the assessor

4c) Customer handover

The operator is at the Guild Hire Ltd site ready for the handover of the highway-compliant all-terrain/utility vehicle at the Guild Hire Ltd site.

You must:

- safely undertake the handover of the equipment to Guild Hire Ltd at their site:
 - undertake a site-specific risk assessment on arrival at the Guild Hire Ltd site using the *Risk assessment template (Figure 1)* provided by the assessor
 - handover the vehicle to the assessor who is acting as the operator, including:
 - how to operate the equipment (no practical demonstration/starting required)
 - the safety procedures and features
 - explaining the vehicle's highway compliance
 - the importance of the operator's handbook
 - the meaning of warning and safety symbols in the operator's handbook and on the equipment
 - maintenance and warranty requirements
 - the importance of serial numbers.
 - respond to any questions from the assessor/operator
 - complete the *Handover checklist (Figure 4)* with the operator using the template provided by the assessor.

Resources

- Operator handbook.
- Service manual.
- *Risk assessment template (Figure 1)*.
- *Handover checklist template (Figure 4)*.
- Computer for completing templates digitally (**no** internet access).
- A copy of your notes from sub task 4a and a copy of your pre delivery inspection record from sub task 4b (for reference only).

Conditions of assessment

- The time allocated for this task is **1 hour**:
 - risk assessment: 15 minutes
 - handover: 45 minutes.
- You must carry out the task on your own, under **controlled conditions**
- This task will take place at the Guild Hire Ltd site – the assessor will assign a suitable area for you to undertake this task, travel time is not included in the task.
- You will be given a copy of your notes from sub task 4a and a copy of your pre delivery inspection record from sub task 4b (for reference only).
- Internet access is **not** permitted for this task.

Controlled conditions

- You must only work on the task in the allocated times.
- Assessment evidence must be handed in at the end of each session for secure storage.
- You must not share or discuss your work with other candidates.
- You are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Handover checklist for each piece of equipment

Additional evidence for this task

- Assessor observation
- Responses to questions, including audio recording

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